**COLOUR PRINTING IN THE UTTERMOST PART OF THE SEA:
A STUDY OF THE COLOUR PRINT PRODUCTS, PRINTERS, TECHNOLOGY
AND MARKETS IN NEW ZEALAND,
1830-1914**

A thesis
submitted to the Victoria University of Wellington
in fulfilment of the
requirements for the degree of
Doctor of Philosophy
in
History of Book & Print
Culture

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Victoria University of Wellington, New Zealand
2002

Abstract

This thesis is an historical study of the development and the relationships between some aspects of colour printing in New Zealand from 1830 to 1914, including the practitioners, the technology and the products, in the context of printing in New Zealand beginning as a largely British inheritance, but within an Australasian setting. A review of the printing history literature has shown that there have been relatively few works in the English language devoted specifically to the history of colour printing. Much of the literature bearing on the topic in relation to British colour printing history deals with specialised aspects such as colour plate books or technical processes. There has been no previous specific scholarly study of New Zealand colour printing history. The research for this aspect of thesis has been in the nature of exploratory work.

An historical methodology was employed to approach the gathering and analysis of data from a wide array of sources, both secondary and primary. A theoretical framework suitable to an academic historical study, of which history of print culture is a part, has been developed using the new model proposed by Thomas R. Adams and Nicolas Barker (1993) as an appropriate foundation framework. This model shows the phases of the 'book cycle', publication, manufacture, distribution, reception and survival, as being central to the whole socio-economic conjuncture. The paradigm developed for the present study is based on the section of the framework relating to the manufacture or production phase, using themes that emerged from the literature to facilitate analysis and explanation of New Zealand patterns and relationships with comparison to British colour printing history.

Within this setting more detailed study was made of some of the colour printers, especially those of the lower North Island, including a case study of the Wanganui firm of A.D. Willis where colour printing was a specialty. A genre study of special numbers from the New Zealand weeklies has also been presented. Rather than attempting to provide a definitive colour printing history the research has provided an interpretive thematic study that has aimed to increase understanding of some aspects of New Zealand colour printing history, and accordingly, responses to research questions have been tentative.

It was found that although colour printing practice continued with strong ties to the British craft, from the beginning, new relationships were being forged particularly with the neighbouring Australian colonies whence immigrant printers and lithographers were arriving. After local lithographic colour printing had begun to develop in New Zealand in the

eighteen sixties, in the period to 1914 local printers were found to have used colour in diverse ways, especially in the context of jobbing printing, chiefly to produce letterpress and lithographic items. The later New Zealand photomechanical colour methods developed within these styles. By the end of the nineteenth century, New Zealand colour printers were following international trends, and more influence was arriving from America, but such trends were still chiefly coming to New Zealand via Britain and Australia, although in a technical sense, New Zealand was generally in a following position.

After the eighteen sixties colour printers were found to have been in business in all the main centres of New Zealand, and in some of the smaller centres. It was apparent that many of the global and technological factors that had driven colour printing were common to both Britain and New Zealand, but that local conditions had also been important. Although print products tailored to local demand and often featuring local images had been produced using a variety of available technologies in each place, limiting factors present in New Zealand, particularly its isolation from the larger markets coupled with a small local population, had dictated that colour was appearing from colonial printers in a more circumscribed way than was the case in Britain. In the main, New Zealand colour printers appear to have responded to marketplace differences by choosing appropriate genre and cutting format costs.

Acknowledgements

I would firstly like to thank my supervisors, Professor Gary Gorman, Dr. Sydney Shep and Mr. James Traue for their guidance and support during this study. Their encouragement and lively ideas have helped me to undertake what I consider to have been a very worthwhile voyage of discovery. Thankyou also to the Department of Information Management at Victoria University for creating the excellent departmental conditions that made it a pleasure to pursue the research, first undertaken with the intention of also contributing to the wider New Zealand History of Print Culture project established by the New Zealand Academy for the Humanities in 1994.

I would like to thank the National Library of New Zealand Trustees for the award in 2001 of the National Library Trustees' Fees Scholarship for Advanced Study in Librarianship. I am grateful for the financial assistance the scholarship has provided.

Many thanks also to the librarians at the several institutions at which I carried out the research, particularly the staff at the National Library and the Alexander Turnbull Library, as well as the librarians at Victoria University, especially Kathleen Coleridge and others at the J.C. Beaglehole Room. I would also like to acknowledge the assistance of the librarians at the Whanganui Regional Museum, the Head Office of the National Archives in Wellington, the Canterbury Museum Research Centre in Christchurch and the Hocken Library in Dunedin, all of whom were extremely helpful in fulfilling my requests for the materials which have underpinned this study.

I would like to thank William Seeney who granted me the opportunity and time to interview him concerning his life work as a colour printer, first in Britain and then in New Zealand.

Thanks very much to my room-mate Lan Anh Tran who has been a real friend. Best wishes for your research and future academic career.

Last but by no means least, I would like to thank my family for the tremendous support they have all given me. My children Michael, Peter and Helen have been wonderful in their various ways. My husband Lindsay, who first encouraged me to undertake this research, has given me great support as well as practical help with proof reading: without him I would never have been able to complete this undertaking at all.

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Note: Acknowledgement of any plate to the Alexander Turnbull Library, Wellington, N.Z. refers to the Alexander Turnbull Library, National Library of New Zealand, Te Puna Mātauranga o Aotearoa.

INTRODUCTION AND RESEARCH TOPIC

Introduction

The world does not appear to us in black and white alone, but rather dressed in the enormous variety of colours that we perceive as innumerable hues, shades, tints and tones. Fashions concerning the way we wish to see the world come and go, one manifestation through the ages being a changing marketplace demand as preferences are expressed for our surroundings to be engineered and presented in the current colour palettes. Such changing demand has often been led by designers working in a wide variety of fields, in for instance, industrial, décor, and apparel design, as well as in such areas as landscaping, architecture and other facets of the built environment. Designers have exercised their influence in the creation of a wide diversity of artifacts and a multitude of useful products, including those that have emanated from the printing industry. Beginning with some early attempts to emulate the colourful medieval manuscript productions, over the centuries printers strove to meet a perennial demand for colour. However, in periods when technical difficulties made it uneconomic and indeed impossible to produce printed colour in an attractive and competitively profitable way, printers often found it wise to concentrate on basic business: the reproduction of exact copies of black and white texts in quantities that were large enough to meet marketplace demand.

But especially through the continuing experimentation of artists and artisans working in painting and the graphic arts, the kaleidoscope of possibility for graphic representation increased and over time much cross-fertilisation took place. From this milieu new ways to produce effects in line and tone arose. Success in black and white occasionally led printers to take the extra step and add the element of colour. As time went on, many men of business inclination saw opportunities arising from the profitable employment of colour, and, providing that the printing process proved economically viable, when the environment was right, they often began to achieve good financial reward. On the other hand, where the market had been mis-read, fashion had changed or the process had some fatal limitation, business failure was likely to occur.

As in many economic spheres, the lead of the few often preceded a discernible trend. In the field of colour printing, in nineteenth century Britain men like George Baxter and William Savage heralded the coming of colour to print media, and over the subsequent years many other printers joined the trend to add colour from the press. Over this whole evolutionary

period, the potential market for colour in print had always been there: the natural desire for printed colour had not diminished but was waiting in the wings. As time progressed and methods came and went, the pool of possibility nevertheless increased, so that at last economic colour processes suited to a multitude of varying demands eventually emerged. Although the road had been long, it had been sign-posted with significant achievement along the way that bore witness to the perseverance, ingenuity, inventiveness and artistic genius of colour printers through the centuries.

The efficacy of print technology to serve democracy was a major strength. Such strength was very much bound up with the claim of print to enduring relevance. The potential for dissemination to a broad audience was created through the intrinsic ability for multiple copy generation and this applied also to the printed image. As technological changes of the nineteenth century enabled the inclusion of colour in both text and image in a more economic way, this important visual element was carried to the mass market in rapidly diversifying ways. The ability of print to be transformed in order to fulfil changing cultural needs and purposes has constituted adaptability to suit the marketplace, and as translator from one medium to another it allowed creative possibility. But it has been the inherent capability of print for wide dissemination that has allowed it to combine these attributes with an ability to continue as a proven tool of communication.

New Zealand European settlement coincided with the period in which colour first entered the northern hemisphere mass marketplace of print. Consequently, the printers of New Zealand, both the innovative few who helped push the technological boundaries and those whose activities were directed towards providing everyday requirements, had the opportunity to make colour part of their particular contribution to that larger cause.

The Research Topic

Definition of the Topic

This study of colour printing history comprises several selected, and closely linked, aspects of colour printing, namely, the technology, the printers, including both individuals and firms, the colour printed products themselves, and the market for colour printed products in New Zealand from 1830 to 1914.

Because printing was first imported by the settlers from the parent country, Britain, the development of printing in New Zealand was closely related, albeit with differences, to developments in the parent country and Europe, as well as to similar development in other colonies of British settlement in North America and Australia, where printing was also,

initially, an export from the home country. The present study aims to explore such connections as a means of extending knowledge relating to likely diffusion patterns of the colour printing facet of print culture, and to answer questions concerning New Zealand colour printers, the processes they used and the items they printed within the context of the print culture of the period. The nature of the topic therefore suggests a comparative approach.

The study has been limited to selected aspects to enable it to be manageable within one thesis. As will be seen in chapter 1, in order to provide a firm basis for comparative study, the emphases chosen for the present research have sprung from directions that have assumed importance in the existing literature. Because the field of colour printing in New Zealand as yet lacks other studies, this will necessarily be pioneering research, and as such will not be able to explore the subject in great depth, although more detailed studies have been included to illuminate each theme appropriately.

The timespan has been chosen both to limit the scope and to encompass the period between the first arrival of printing in New Zealand, just before the time of European settlement, and the year that offset processes, important to colour printing, were introduced in this country. The closing year of 1914 also marked the onset of the First World War when the printing industry was adversely affected during the ensuing period of unfavourable economic conditions, and while trading relationships with countries supplying essential commodities was curtailed, shortages, for instance of paper, changed the local printing production environment.

The study belongs to the wider field of the history of print culture, or history of the book, of which printing history is a part. Print culture can be viewed as the study of the synergy between physical artifacts, such as books, and the ways in which they have been used. Thomas Adams and Nicolas Barker have said that both aspects contribute to the influence and power of books and that a framework appropriate to the study of the history of the book must place the life cycle of 'the book', consisting of its publication, manufacture, distribution, reception and survival phases, at the centre, but considered within the socio-economic circumstances that are relevant to each stage. (See figure 1.)¹

A New Model for the Study of the Book:
After Thomas R. Adams and Nicholas Barker (1993)

Figure 1

To be feasible within the limitations of this thesis, the emphasis for the study, within such a framework, is on aspects of the manufacture or production phase. It does not cover the much broader phases of distribution, reception and survival except for the consideration of any relationships that bear upon the central study, for instance, that between production and reception, for example, as market feedback modifies what is produced. (See figure 2.)

The approach to the topic is historical. However, because a literature review reveals that there have not yet been other studies specifically on the history of colour printing in New Zealand, the topic lacks an established narrative and chronology. It will consequently be necessary to follow traditional historical procedures to first establish chronology and narrative in order to provide a context within which the chosen aspects of New Zealand colour printing and colour printing firms can be more closely investigated before major relationships and issues can be discerned, and explanations attempted.

Socio-Economic Conjuncture:
Influences that bear on the phases
of the book cycle:
Intellectual, Economic,
Public Institutional,
Cultural & Social Factors.

Figure 2: Highlighting some Aspects of the Manufacture/Production Phase of the Book Cycle

Print cultural studies are intrinsically cross disciplinary. Robert Darnton has given a definition of cultural history as “the study of culture in the anthropological sense, including world views and collective mentalités.”² The development and use of tools and technologies has always been seen as a defining characteristic of successive human cultures in this sense, and part of this development is the intellect behind the artifact, so that any study of technological history involves inventors and innovators, and the social history of the diffusion of their ideas and inventions. For intellectual history as part of cultural history, the print culture historian Roger Chartier has advocated Carl Schorske’s view. He has said that:

The historian seeks...to locate and interpret the artifact temporally in a field where two lines intersect. One line is vertical, or diachronic, by which he establishes the relation of a text or a system of thought to previous expressions in the same branch of cultural history (paintings, politics, etc.). The other is horizontal, or synchronistic; by it he assesses the relations of the content of the intellectual object to what is appearing in other branches or aspects of a culture at the same time.³

Thus a fruitful direction for cultural historical study is to take up the chronological as the vertical line and the geographical approach as the horizontal, since the effects of human cultures are expressed not only in temporal ways, but also in a spatial manner. For this research, the geographical aspect will be particularly appropriate to that part of the inquiry concerning printers in business. Within this aspect, colour printers of the lower North Island will be given prominence not only because the region approximates to the Wellington

Province which is geographically Wellington's home region, but also because there were a considerable number of colour printers operating there during the study period.⁴ One of the nineteenth century New Zealand colour printing firms active in this region, A.D. Willis of Wanganui, will receive special attention as an illustrative case study that may serve to identify aspects that may not be highlighted in the broader structure.

Place of the Research Topic in Print Culture Studies

History of print culture, a relatively new discipline, includes within its scope the history of print in all its guises. 'The book' tends to be widely defined to include the whole production from the printing press. Most writing on the history of book and print has dealt with the northern hemisphere experience, and within this field, printing history accounts have more often focussed on the way printing technology has facilitated the wide dissemination of the textual and to a lesser extent on the contribution of the graphical to the visual dimension of print culture.

A study of the history of printing, including the part that colour printing has played, can give exciting and rich insight into how its influence has come to reach into every corner of life. It was Gutenberg's fifteenth century invention that led to the first printing revolution, precipitating a rapid change, so that particularly text, principally printed with black ink on white paper, could be printed and disseminated to a much wider market. Since then the printed word has always been an important way in which thought has been transmitted, received, stored and retrieved. Meanings, insights, stories and knowledge in many languages down through history have been carried encoded in the forms and arrangement of typographical characters from the many fonts designed to facilitate human communication. Printed images have been another influential vehicle, and these two modes have frequently been combined, as printers have created print products to serve a multitude of purposes, often also employing the visual element of colour as a desirable market element.

For the print culture historian, this brings up questions surrounding both these modes, the textual and the graphic, and leads one to inquire about aspects of the production, transmission and reception of both printed texts and printed images, and their place as vehicles of communication down through history. What part has that ever versatile printers' tool, colour, played in this? Vision is a very important human sense,⁵ and since colour vision is part of that,⁶ the desire for and use of colour is natural, and has therefore occupied a place as a pleasing and necessary element in various kinds of encoded communications that are symbolic representations of the world. However, the achievement of economically

viable commercial modes of colour printing, especially the colour printing of images for the mass market, proved to be a more a gradual and complicated process than the Gutenberg revolution had provided for text. Until a nineteenth century quickening in pace, the development of colour printing was more an evolution – one that involved experimentation, variety in application, innovative people and adaptation over a long period to changing markets.

Another factor that has focussed scholarly attention on the visual, including on the mechanisms of colour vision, has been the modern interest in brain research, which in turn has triggered reflection on the visual side of printing. The application of scientific studies to explaining the role of the brain in encoding objects as images has recently led to greater insights and has yielded an understanding of the mechanism of human colour vision, the ability for which has played an essential part in the history of colour printing, both as the colour printer's tool and as a cultural influence in the market.

New Zealand Print Culture

In New Zealand, the study of the history of print culture has emerged as a discipline relatively recently. The field has come to greater notice in the last decade by the appearance of projects which more systematically address the subject using an interdisciplinary approach to focus studies at a national level in countries such as Britain, America, France and Australia.

Colour printing in any period can be seen as an intersection between such complex factors as time, place, process, practitioner, and market. The book historian Wallace Kirsop (1977) has said that, for studies concerned with the nineteenth century book trade in Australia, "on the one hand it is necessary to observe the interaction of colony and mother countryand on the other it is essential to compare and contrast different colonial societies in their links with Europe and among themselves."⁷⁷ In his paper 'The Two Histories of the Book in New Zealand' (2001), James Traue has stated that "book history in New Zealand is very much part of the history of minor adaptations, to fit local circumstances, to the broad stream of the British book."⁷⁸ More recently, in *Book & Print in New Zealand: A Guide to Print Culture in Aotearoa* (1997), it has been said "the technology of printing had to be imported into New Zealand, accompanied by the skilled operators...equipment and skills came directly from Europe, the birthplace of printing four centuries earlier, in particular from Great Britain, the colonial master, and also indirectly by way of Australia, the nearest colonial neighbour, and later on from North America."⁷⁹

Hence for this study it is necessary to understand the context of the inherited British culture, before turning to colonial New Zealand. The importance of the Australasian setting during the study period necessitates side-glances at the colonial Australian experience to tease out the significant links between these two Antipodean print cultures. Ian Morrison has observed for instance, that

During the 1880s most writers still regarded New Zealand as one of the Australasian colonies—physically separate from the Australian mainland, but no more separate culturally than Tasmania or Fiji.¹⁰

A greater appreciation of trans-Tasman print cultural interaction assists the answering of such questions as: what has been the place of colour printing, who have been the influential colour printers, and how have the processes, products and markets developed and changed over time? Have there been recurring developmental patterns in different geographical places and what are the reasons for such patterns?

¹ Thomas R. Adams and Nicolas Barker, 'A New Model for the Study of the Book', in *A Potencie of Life: Books in Society: The Clark Lectures 1986-1987*, ed. Nicolas Barker (London: The British Library, 1993), 5-43.

² Robert Darnton, 'Intellectual and Cultural History', in Michael Kammen, ed., *The Past Before Us: Contemporary Historical Writing in the United States*, 1980, quoted in Roger Chartier, *Cultural History: Between Practices and Representations*, trans. Lydia G. Cochrane (Ithaca, N.Y.: Cornell University Press, 1988), 20.

³ Carl E. Schorske, *Fin-de-Siècle Vienna: Politics and Culture*, 1st ed. (New York: Knopf: distrib. by Random House, 1980), xxi-xxii, quoted in Roger Chartier, *Cultural History*, translated by Lydia G. Cochrane, 45.

⁴ As well, for the purposes of this thesis, research materials relating to the lower North Island printers are more accessible.

⁵ According to Prof. Geoffrey Satchell, in mammals the organ of vision, the eye, has developed "to a high level of sensitivity": unpublished comparative physiology lecture, University of Adelaide, 1961.

⁶ "Colour vision is more dominant in the human species than in nearly all other species except primates". Interview with Dr. M.B. Johnston, Psychology Department, La Trobe University, November, 1997. Used with permission.

⁷ Wallace Kirsop, 'Consignment Sales and Britain's Nineteenth-century Colonial Book Trade', in *Libraries in Society: Proceedings of the 19th Biennial Conference Held in Tasmania, August 1977* (Hobart: Conference Committee, Library Association of Australia, 1977), 91.

⁸ James Traue, 'The Two Histories of the Book in New Zealand', in the *Bulletin: Special Issue / Bibliographical Society of Australia and New Zealand (BSANZ)*, 25 no.1&2 (2001): 1.

⁹ P.A. Griffith, Ross Harvey and Keith Maslen, eds., *Book & Print in New Zealand: A Guide to Print Culture in Aotearoa* (Wellington: Victoria University Press, 1997), 46.

¹⁰ Ian Morrison, 'Cook's Choice—Reflections on Trans-Tasman Literary Culture' in *Books and Bibliography: Essays in Commemoration of Don McKenzie*, ed. by John Thomson (Victoria University Press, 2002), 166.

SECTION I

An Historical Study of Colour Printing In New Zealand

CHAPTER 1

LITERATURE REVIEW

Introduction and Objectives

For a study which has the intention of beginning an exploration of some aspects of the history of colour printing in New Zealand, it is first necessary to go back to the place whence printing came to the Antipodean cultures. Accordingly, the literature relating to European, and especially British colour printing will firstly be reviewed, before moving on to literature relevant to colour printing in New Zealand.

Some objectives of the review of the literature are to provide an overview of what research has been accomplished in the past relating to the wider subject of the history of print culture that is particular to the area of colour printing and to indicate some approaches that have been made, directions that have been taken and what has been discovered. A review may also tease out recurring themes, and point the way for new studies, by revealing areas that have not been adequately covered, that may be entirely barren, or work that may have been obscured by the passage of time.

Colour Printing in European and British Print Culture

A preliminary search of standard bibliographies,¹ library catalogues and online databases for literature on the history of colour printing *as such* produced only a handful of works. It soon became clear that the literature was structured around a small core of general historical works on colour printing, with a wide spread of more specialised studies, in which aspects of colour printing appear, such as in studies of book illustration, prints, graphic processes and technology, of genre such as maps and ephemera, and studies limited to particular time periods. Moreover, nearly all of the few core specific general works on colour printing history are not recent. To extract information bearing on colour printing history therefore necessitated a broad literature search of general print culture history and of genre history. Appropriate tools were used to facilitate the location of items.

Pioneering Studies

Searching the tertiary sources revealed that although there have been numerous authors who have researched and discussed particular aspects of the history of colour printing, very few have made an exclusive or integrated study of it, so that the list of works which could be

said to approach a comprehensive study or even a general history is relatively short. A key title is *Colour Printing and Colour Printers* by R.M. Burch, which was first published in 1910 and reprinted in 1983.² This pioneering historical work was originally presented as a series of trade articles published between 1903 and 1906. The 1910 book, organised chronologically, began to illuminate a hitherto neglected subject, particularly of the history of colour printing as it related to single prints and colour illustration for books; maps were rarely mentioned.

Burch's work highlights the fact that just as an appreciation of actual practice can inform the study of typography, so an appreciation of the evolution of the processes of the graphic arts is just as heavily dependent on an understanding of processes and equipment as on the history of the printers and the markets for their products. Written with the immediacy and authority of an author not only thoroughly conversant with the practical but also having the advantage of first hand familiarity with the print objects he discusses, Burch's account is a focussed, engagingly fresh exposition of colour printing developments. There was no bibliography. In the preface, Burch said that "the present volume is not offered to the reader as a complete history of Colour Printing, but merely constitutes an attempt to indicate some of the lines on which the compilation of such a book might proceed."³ However, in a new introduction to the 1982 reprint, Joan Friedman concluded by stating that not only was Burch's early twentieth century account of colour printing exploratory in its time, but also that it had not by that time been succeeded by any modern account:

Burch's achievement was to produce a sober and well-balanced history in a field untrodden before. It is not a scholarly history chock full of footnotes and references to obscure treatises; Burch noted in his introduction, "This being practically the first work devoted exclusively to a history of printing in colours, it is not possible to refer to previous authorities on the same subject" (p. x). Rather, the information is based soundly on a systematic examination of primary evidence, books and prints. Though specific topics in the history of color printing have been studied in detail since Burch's day, his work has never been superseded by a modern history of color printing.⁴

Even earlier accounts of colour printing had tended to be directed at audiences other than a scholarly community, often a trade audience, in the form of practical printer's manuals, or print collectors. As far as reference to colour work is concerned, early comprehensive manuals, such as *Moxon's Mechanick Exercises on the Whole Art of Printing* (1683-1684), contain information only on very simple colour printing in the form of the addition of red,⁵ since it belongs to a period in which printed colour was rare: in the main this branch of printing had proved either too expensive, too difficult, or both.

By the early twentieth century, when technical developments finally allowed colour to play a more prominent role in the visual appearance of a wide range of print materials, the

occasional title was appearing on some aspect of the topic. *English Coloured Books*, by Martin Hardie was published in 1906, around the same time that Burch was writing. This work was illustrated with examples that indicate the range of colour methods by which the colour plates under discussion had been produced. Burch's 1910 book, seen in the collection of the State Library of South Australia, also had been illustrated with such examples.

Recent Work

Between the time in which R.M. Burch and Martin Hardie were writing and the present, except for authors such as Geoffrey Wakeman and Ruari McLean who have addressed specific aspects, the topic of the history of colour printing was relatively neglected, and until recently has remained a latent subject for scholarly attention. Perhaps the greater emphasis given to colour printing in the new digital environment, partly through the advent of desktop colour printers, has prompted a fresh look at the topic, and a new assessment of the potential of the colour printing element has given impetus to the desire to look back at its historical place in print culture. For example, Bamber Gascoigne's *Milestones in Colour Printing 1457-1859: With a Bibliography of Nelson Prints* appeared in 1997 and in 1998 one of the most authoritative twentieth century printing history authors, Michael Twyman, gave definite emphasis to the topic in his title, *The British Library Guide to Printing History and Techniques*.

Gascoigne's 1997 book resulted from his 1994 presentation of the four Sandars Lectures in Bibliography which were on the topic of the history of colour printing. Taking a chronological approach, Gascoigne has highlighted some of the important moments in colour printing such as the beginnings of chromolithography, a subject on which he has previously published research findings in the *Journal of the Printing Historical Society (JPHS)* (1982/83). This condensed historical survey gives appropriate emphasis to print-making history, as an introduction to the major feature of this work which is the bibliography and catalogue of prints that emanated from the nineteenth century firm of Thomas Nelson and Sons of Edinburgh and London. The preliminary chapters contain only a very few references to source material, and there is no bibliography. Reviewing this book in the April 1999 issue of *The Library Quarterly*, Philip Weimerskirch noted that the fourth lecture (on Nelsons) contributed "much valuable new information" but also pointed out the paucity of secondary references accompanying the earlier chapters.⁶

Although constituting but a short survey of print culture in general, Twyman's book, which includes well-chosen colour illustrations and lists for further reading, is a more concise

updated summary of some of the information in the author's earlier longer works within the wider field, such as his *Printing 1770-1970: An Illustrated History of its Development and Uses in England* (1970), which has been recently reprinted in 1998 with a new foreword by Ruari McLean and an additional bibliography. The shorter work allows a revisiting of some issues as well as a recapitulation of former themes. For instance, the theme of the need for verisimilitude associated with the rise of science was one that Twyman emphasised in his chapter 'The Emergence of the Graphic Book in the 19th Century', which was a contribution to the 1994 title *A Millenium of the Book*. Under the heading 'Colour printing becomes a necessity', in *The British Library Guide to Printing History and Techniques* (1998), Twyman highlighted colour printing as often having been an essential part of this need for the appearance of reality, stating that "in the early nineteenth century it became imperative to find ways of producing coloured images relatively cheaply"⁷, and cited the needs of scientific discourse as being of as much importance as other drivers such as aesthetics or commercial opportunity. Twyman touches on what, in his view, were the two major problems that for so long retarded colour printing development – the technical difficulties, and the necessity for special visual abilities, stating that of the two, the second was the harder aspect to solve. Twyman considers that the visual intelligence needed to accomplish successful colour separation work, especially in periods before the introduction of the photomechanical processes, "nowadays beggars belief."⁸ Even though he does not elaborate, the importance to the printer of excellent colour vision ability is an aspect of colour printing history that has been rarely pointed out, and one that deserves a closer look.

From a general survey of the literature it can still be said that almost a century after the first appearance of Burch's ground-breaking work, no other complete account of colour printing has appeared: the definitive history of colour printing is still to be written, and this is one reason why a range of sources must be consulted to both update and understand the background history of this part of the print culture that was imported from Britain, as it stood at the various times of settlement, to colonial America, Australia and New Zealand. Consequently, a literature review becomes also a review of sources.

Themes (See figure 3)

Since colour printing, as a specialised part of printing history, falls chiefly into the area of 'production', or 'manufacturing' in the Adams and Barker model of the event cycle in the life of 'the book', an historical study of the subject is facilitated by an appropriate thematic treatment centering within that area. From the wide variety of literature dealing with parts of the topic, several main themes have emerged: from both general printing history and

from literature focussed on narrower topics, for example, on particular printing modes, whether relief, planographic or intaglio, all of which have been adapted many times for colour processes. These themes will be further discussed in chapter 2.

In addition to fundamental chronology and background technological and other cultural information, themes that have emerged from the literature can be stated as: Colour Processes and Equipment; Influential People, (such as printers, inventors and other innovators); Genres and Markets; (including colour for book illustration, prints, maps and ephemeral items); and Standards. The literature reviewed will be grouped accordingly.

Figure 3: Some Aspects of Colour Printing as Part of the Production Phase of the Book Cycle

Background and Chronology

Some authors, particularly those with an interest in art and design, have taken a wide view of print culture history and have included in general studies the subject of the creation and transmission of graphic expression, especially that concerned with book illustration, an area in which colour printing has often featured. For instance, in *Anatomy of Printing: The Influences of Art and History on its Design* (1970), John Lewis focusses on art in printing and illustration as an integral influence, saying that printing, whether textual or graphical, became a primary way to transmit ideas, the different modes catering for both the literate and those who could not read.⁹

Bringing out the dual role of the book as both physical object and as vehicle for the content, *The Book Through 5000 Years* (1972), edited by Hendrik Vervliet, is an example of a

general work that has seen the synthesis of the separate elements as providing the essence of the book as an object, so that in the most successful cases, word and picture become complementary. In this work, themes such as market influences and the role of technological changes intertwine. A central philosophical discussion of the place of the book throughout its history begins with the period of the cradle of the book, the pre-Gutenberg manuscript era and the incunabula, to which a large portion of this work is devoted. Colour illustration, especially from this era, features strongly, serving to underline the fact that the element of colour was an everyday presence for those privileged to have access to books, and that although the model for the early western printed book was the manuscript, perversely it was during the period of the appearance of the printed western book that colour in fact largely disappeared. Other titles such as Levarie's *Art and History of Books* (1982), Eleanor Garvey's *The Artist and the Book, 1860-1960: In Western Europe and the United States* (1982) which has an introduction by Philip Hofer, and Twyman's *Printing 1770-1970: An Illustrated History of its Development and Uses in England* (1970; reprint, 1998), each covering varying time-spans and geographical locations, also take the wider view, incorporating history of prints and other categories of print materials in the discussion. Levarie, chronologically outlining some of the main influences on developments in the book arts, subdivides the discussion by European country, (including England). Emphasising the early period of printing, Levarie's work gives only brief references to colour printing, but is nevertheless a valuable contribution to the background literature of visual print culture.

Twyman's *Printing 1770-1970* (1970; reprint, 1998) excludes a discussion of book illustration in order to bring other less studied printing areas into more prominence, in particular, jobbing printing, a class of print production in which colour has frequently been used. Twyman is one of the few authors of general works to give attention to colour printing history, and devotes a short chapter to the topic. A bibliography is included which has been updated in the 1998 reprint of the work. Giving emphasis to the technical revolution that occurred in the nineteenth century, Twyman states "it seems very clear that the most important innovations in printing after about 1800 were not made by book printers, but by numerous craftsmen, engineers, artists, and designers..."¹⁰⁷

Reader in the History of Books and Printing (1978), edited by Paul Winckler, is a synthesis of scholarly studies on various aspects of print culture, a collection of reprints described as "essential contributions from ... the elusive sources."¹¹ Included in this book is a chronological survey of printing, a reprint from *Printing and the Mind of Man: An*

Exhibition of Fine Printing in the King's Library of the British Museum, July - September, 1963, in which it was reiterated that printing was "originally conceived as a process for the mechanical reproduction of manuscript."¹² Writing retrospectively of the exhibition from the perspective of the age of the computer, the modern tool that however lacks the same physicality that was afforded by the book, Sebastian Carter has said that it has been through such embodiment as the look and feel of a book that we are put in touch with authors in a special way, and that it was through the presence of the printed artifacts that *Printing and the Mind of Man* provided "an unmatched opportunity to study this embodiment of thought."¹³ However, it is ironic that the element of colour, so important to the look of the illuminated manuscript, proved difficult to include in the printed item. An understanding of the history of the technical processes is necessary to understand reasons for this.

Processes and Equipment

Just as an appreciation of the actual practice of setting type and the process of printing from it enlightens the study of typography and textual printing history, so an appreciation of the development of image printing is heavily dependant on an understanding of the underlying graphic art processes. From the broad spectrum of literature, one of the main features that becomes apparent is the contrast between the revolution that took place for textual transmission in Gutenberg's time and the much slower evolution, up to the close of the eighteenth century in particular, of graphical techniques which are the foundations of colour printing. It was not until over three hundred years after Gutenberg that the technological pace began to quicken for colour printing in the nineteenth century.

Accounts of the graphic techniques used for black and white printing apply also to the understanding of the colour processes which they frequently underly, and these often form a topic for discussion in the general printing histories. Some authors have published works that focus more particularly on this theme or on some aspects of it. Michael Twyman's authoritative work *Lithography 1800-1850: The Techniques of Drawing on Stone in England and France and their Application in Works of Topography* (1970) was seminal in drawing attention to the importance of this process as it relates to the printing history of the nineteenth century and beyond. A theme that Twyman emphasises is the key role played in that era by the increase in public demand that went hand in hand with new machines and processes to stimulate longer and longer print runs.

Like *Printing and the Mind of Man*, many works that have concentrated on a particular aspect or time period of colour printing have also emanated from an exhibition. The 1978 title, *Color Printing in England 1486-1870* by Joan Friedman resulted from an exhibition

held at the Yale Center for British Art, New Haven, 20 April to 25 June 1978. Organised chronologically, this book acts as a guide to English colour printing through the notes that accompanied the exhibition which comprised works from the period of the early eighteenth century revival of the chiaroscuro woodcut style to the nineteenth century development of the chromolithograph. Works were chosen from the collections held at the Center. Well-researched, detailed annotations for each example of the items in the exhibition, together with reproductions of each, including over twenty in colour, provide an excellent survey of many aspects of colour printing development over the period, mainly as applied to book illustration. John Feather considers that this book is particularly admirable for the pre-photographic period.¹⁴ Although some single prints were included, there is only one example of a colour printed map, and a very few of ephemera. Printers, publishers, engravers and artists all feature through the succinct but informative notes, which often also give a clear account of the particular colour process that was involved in the production of the example under discussion. The reproductions, however, form a separate section of the book, following the text, thus making it difficult to marry exposition with example. An index facilitates identification of specific detail and serves to offset the disjointed style that is inherent in the exhibition format. There is a useful bibliography.

The exhibition *Color Printing in the Nineteenth Century*, originally held in 1996 by the University of Delaware Library, an institution which possesses great strengths in the areas of the history and technology of printing and the book arts in its collections, has been mounted on the web.¹⁵ Taking a technical theme as its primary interest, some of the major colour processes are briefly outlined and effectively illustrated with colour examples according to the categories of relief, planographic, or intaglio printing, and with a separate section on nature printing. A more recent web-based exhibition is the British Library's *Aspects of the Victorian Book* mounted in 2001 to mark the centenary of the death of Queen Victoria. Drawing on the library's extensive collections this thematic exhibition contains many allusions to processes of colour printing.¹⁶

Books dealing with the technical side, such as Geoffrey Wakeman's *Victorian Book Illustration: The Technical Revolution* (1973), are essential to an appreciation of how the technical theme is pivotal to nineteenth century British printing history, particularly in its relationship to the graphic side of print expression. Works devoted to tracing developments in a particular printing style or process, such as Otto Lilien's scholarly study *History of Industrial Gravure Printing up to 1920* (1972) are invaluable sources for technical aspects of colour printing relating to a particular style, in this case, to the intaglio processes.

Wakeman's *Victorian Colour Printing* (1981), which contains examples of colour printed ephemera of the time in a back pocket, also concentrates on nineteenth century colour processes, with plates to illustrate, for instance some of the transfer grain patterns used in this period. In *The Production of Nineteenth Century Color Illustration* (1976), a limited edition publication, Wakeman has discussed aspects of the work of successive nineteenth century colour printers, with examples of their illustrative plates in colour.

James Moran's *Printing Presses: History and Development from the Fifteenth Century to Modern Times* (1973) is indispensable, as it is one of the few works to cover this aspect of the technical theme well. Much readable information on the background development of printing machines and equipment is given in this work, which is useful in helping to assess the state of the art of this side of printing as it was when imported to Australasia. For an historical discussion of one of the materials which is particularly critical to successful colour printing, printer's ink, Colin Bloy's *A History of Printing Ink, Balls and Rollers* (1967) is a definitive background work.

One of the technical break-throughs of the nineteenth century was the invention of photography, which was later linked to all the major printing processes, precipitating a rapid shift from the old manual processes towards the much more mechanised printing technology which is typical of international commercial colour printing today. John Szarkowsky treats this aspect thoroughly as part of the interestingly illustrated *Photography Until Now* (1989), an account which acts as an excellent bridge to texts which explain twentieth century photographically-based colour printing such as the book by Dr R.W.G. Hunt, *The Reproduction of Colour in Photography, Printing & Television*, (1987). Detailed technical information on twentieth century practice is given in this work, with colour illustration and further references. Another good basic account which focusses on the technical theme, discussing issues inherent in modern colour printing processes, is Anthony Mortimer's *Colour Reproduction in the Printing Industry* (1991).

In *Prints and Printmaking* (1980, 1996), Antony Griffiths succinctly surveys this side of printing from the viewpoint of the major processes that have been employed in print production. This work is a useful source for technical terminology, and includes a short section on colour printing. The general bibliography provides a list of further literature under several headings: it is telling that under the heading 'Colour Printing', Burch's is the only work cited in the 1980 edition, and in the 1996 edition, in which the text is largely unaltered but which has an enlarged bibliography, there are only two additions to this

section, one title by Otto Lilien (1985), on a specific innovator in the field of colour printing, *Jacob Christoph Le Blon*, and the other on a particular technique, *Chiaroscuro, the Clair-Obscur Woodcut by the German and Netherlandish Masters of the 16th and 17th Centuries* by Walter Strauss (1973). A particularly useful book, written as a guide, is *How to Identify Prints* (1986) by Bamber Gascoigne, as it gives a wealth of detail on the recognition of characteristics of prints as they derive from the scores of processes, including manual and photomechanical that were used to produce them in black and white or colour over the centuries. Providing a logical means of steering a course towards matching a specific example of printing with the process used to produce it, the book's 'Sherlock Holmes' approach is made possible by the classification of the material into print families and their branches, set out in part I. Many illustrations are given, and particularly in the second part of the book, magnified detail, essential to the identification process, is frequently given to visually demonstrate how impressions from different processes can be distinguished. The book does not specifically cover maps.

However, the genre of maps, which Burch mentioned only in passing, has been discussed by several authors in the work *Five Centuries of Map Printing* (1975), edited by David Woodward. A chronological approach has underpinned exposition of the major theme of the development of techniques and processes which have been used to produce maps over the centuries. Although colour in maps has been a prominent feature throughout their history, reference to their colour printing has been made only as part of the discussion of processes, rather than being treated as a separate topic, so that information must be gleaned mainly from passing references. However, in *Art and Cartography* (c1987) edited by David Woodward, Ulla Ehrensward has contributed a chapter entitled 'Color in Cartography: a Historical Survey' which deals more fully with this aspect.

Articles that have appeared in the periodical the *Journal of the Printing Historical Society* often illuminate a technical theme that is relevant to colour printing history, for example, Elizabeth Harris's four informative historical papers entitled 'Experimental Graphic Processes in England 1800-1859', (*JPHS* 1968/69). One article is on Nature Printing (*JPHS* 1970), a topic which was excluded by Burch, and another, 'The Lithographic Hand Press, 1796-1850', discusses the complicated subject of Senefelder's hand presses (*JPHS* 1967).

A nineteenth century periodical that began in 1867, *The Chromolithograph: a Journal of Art, Decoration and the Accomplishments*, printed and published in London by Zorn and Company, was a continuation of the earlier *Nature and Art* which had been published by the

well-known firm of Day & Son. The later journal, edited by William Day after the firm had gone into liquidation, had a life of only two volumes, but is an interesting source from the period. Because it was devoted to the chromolithographic arts, all its coloured illustrations were intentionally printed using that process, so that it contains many actual examples of chromolithographic printing. As noted by Joan Friedman,¹⁷ it was the first magazine to so focus on chromolithography as a process, but ironically, at a time when other processes were beginning to overtake it. The popular articles give an indication of the art interests of the day, especially through the two main categories that centre around artists and their works through the ages, and a series of lessons on art techniques, such as painting in watercolours, but, no matter what technique was being discussed or used by the artist of the paintings being discussed, all illustrations are printed using chromolithography as the reproductive printing process. Because the resulting chromolithographs vary in standard, the examples also inadvertently illustrate some of the difficulties of the process and the shortcomings of some of the work then being produced, although the overall standard in the magazine fell short of that generally being achieved in England by the sixties in other genre. For instance, the illustration accompanying an article on the Paris Exhibition of an item from the exhibition by Mm. Miroy Frères 'Bronze Candelabrum'¹⁸ suffers from inaccurate register, and many of the old master paintings have a muddy appearance, due to the use of the opaque inks more suited to the printing of facsimiles of illuminated manuscripts, or modern versions of the manuscript style, which use less overprinting. An example of the latter is the illustration of a portion of an Irish manuscript accompanying the article *The Study and Practice of the Art of Illuminating* by W.G. Audsley.¹⁹ (Plate 1.)

The trade journals are important sources of the trade information being disseminated in successive periods. Since it was specifically produced for all those who worked in the photomechanical print processes, the long-running British *Penrose Annual* was especially relevant to the visual side of print culture, including the facet of colour printing. This widely circulated journal, the first established journal dealing exclusively with photomechanical work,²⁰ grew from the Penrose Company's monthly circular *Process Work* which was produced when their new Photo-Process Stores opened around 1893 to facilitate the supply to printers of the necessities of the trade.

Until then such information was available from widely scattered sources. Avowedly aiming at the commercial printing sector, volume one appeared in 1895 as the *Process Work Year Book*, with a greeting "to our world-wide circle of customers", which included Australian and New Zealand printers, stating "we've got wares to sell, and this book is got up to cry

our wares.”²¹ Later a separate publication, the *Penrose Catalogue* was published as part of this first volume, and is a source of information for printers’ equipment, especially that which was pertinent to the printers using the latest photomechanical methods, including the colour processes, at a time when many printers were beginning to make the change to the trichromatic processes of colour printing. Articles by recognised experts on a wide variety of topics were published in the journal, many containing technical information or information concerning new processes and equipment, but others were historical or evaluative. Copiously illustrated with the best examples from all over the world, not only from British printers, many showing the latest colour processes, the *Penrose Annual* provides much information, itself graphic, that is useful for tracing developments in this side of print culture as they occurred.

The *British Printer*, which began in 1888 with six numbers a year and a circulation of 3000, was the official organ of ‘The British Typographia’ with which was incorporated ‘The Printers’ International Specimen Exchange.’ Characterising itself as “a journal of the graphic arts,”²² it contained not only articles but also many worked examples of the colour printer’s art for the educative perusal of its international readership. The journal gave prominence to items from the job printer, for example, in the first issue of the second 1889 volume, a notice appeared announcing a competition for the best business card to be printed in three colours from two workings. The winning entries were later thoroughly discussed and reproduced as supplements. Columns concerning both colonial Australian and New Zealand printing matters appeared in the pages of the *British Printer* from time to time.

Influential People

The people who have been involved in the long development of colour printing, and the changing relationships between them, is a theme that is closely allied both to the previous theme, and to the one which follows, that of the printer’s market. This theme is closely related to the technical since it was largely the evolution of processes, equipment and machines that dictated the shifts in how the actual work of printing production was carried out, and how training was acquired by those who participated in the various branches of the changing colour printing scene. By the late nineteenth century the photomechanical revolution had caused emphasis to be placed on originality as it resided in the hand of the

Plate 1: ‘Blessed are the Pure in Heart for They Shall See God.’ A portion of an Irish manuscript accompanying the article *The Study and Practice of the Art of Illuminating* by W.G. Audsley. Published in *The Chromolithograph*, vol. 1, 14 December, 1867: plate opp. 50. By permission of the Alexander Turnbull Library, Wellington, N.Z., New Zealand and Pacific Collection. Ref. No.: S-L 367-

artist, and the contribution of the colour lithographer as executor began to take a back seat, even although the partnership between artist and printer, especially for successful chromolithography, remained vital. Pat Gilmour, writing of her research into the French colour printer Auguste Clot, who was associated with the colour revolution of the nineties that began in France, when so many print artists were using lithography as a medium, makes the point that the consequent omission of the name of the actual printer from so many prints by the end of that century hinders research into the printers that were behind the process.²³ In the foreword to the book on lithography, *Lasting Impressions* (1988), of which she was editor, Pat Gilmour pointed out the need not only for more research into the under-researched subject of the history of print-makers and print-making, (evident from the fact that first study of the key nineteenth century British lithographer Charles Hullmandel was appearing in that book), but also “into commercial aspects of print production.”²⁴ Gascoigne’s (1997) book goes some way in both these directions, with its emphasis on the history of British prints, and especially on the nineteenth century production from the printing firm of Nelsons which was involved in the commercial side of colour printing.

Since the nineteenth century was the period in which printers were actively exploring colour processes in the effort to bring this element to products produced for the mass market, it is natural that some of the more influential figures, such as George Baxter, have been the subject of particular research. The early work of Charles Courtney Lewis, *George Baxter (Colour Printer): His Life and Work* (1908) was one reason that Burch did not write at length on that printer’s contribution. Other authors who have concentrated on the nineteenth century, for instance, Ruari McLean, have given accounts of the period in which the theme of influential people has been central, especially the colour printers themselves as innovators and keepers of standards. Ruari McLean’s recent book, written in collaboration with Antonia McLean, and entitled *Benjamin Fawcett: Engraver and Colour Printer* (1988) is a rare example of a study of a nineteenth century colour printing firm, and updates an earlier 1925 account of Benjamin Fawcett written by the Rev. M.C.F. Morris who knew him.²⁵ The front cover of the book features a colour reproduction by this nineteenth century printer, announcing him as “finest of the colour printers.” (Plate 2.) Relying heavily on correspondence from Fawcett himself, and leading up to a listing of the colour plates and books which he produced, this book contains not only interesting biographical facts, but also lays emphasis on science as an important nineteenth century market driver in England, as well as giving more information on the theme of colour printing techniques, especially concerning the colour woodblock relief processes that had been revived in Fawcett’s period.

One recurring theme in Burch's early account is that of 'innovative printers' as he discusses the sometimes brilliant attempts to use the printing press to add colour to the page through the centuries after Gutenberg. Burch often includes biographical information on some of those who were responsible for the gradual technical discovery that was vital to the earlier more gradual evolution of colour printing, as well as those prominent in the later quickening of pace in the nineteenth century, such as Savage, Baxter, Knight and Evans. In the introductory chapters of his 1997 book, the legacy of influential printers is also a theme picked up by Gascoigne as being closely linked to his narrative of many of the developmentally significant colour printing processes. One early printer mentioned by Gascoigne as having been part of the drive to achieve colour printing accuracy in the service of science, particularly of medical science, was Jacques-Fabien Gautier d'Agoty. D'Agoty had been an assistant to Le Blon, the first printer to try to apply Newton's 1704 concept of three primary colours to colour printing, in order to produce all colours from a combination of just three: red, yellow and blue. A recent book, with a short introduction by Adam Lowe, that highlights this pioneering colour printer, *Jacques-Fabien Gautier d'Agoty* (1996), is really a vehicle to display a selection of d'Agoty's anatomical colour prints which were originally life-size. Lowe states of d'Agoty that his "greatest insight was to realise the impact printed colour images would have on the formation of knowledge,"²⁶ that is, that he saw colour as an element of precise communication, that consequently had a pioneering influence in what was later a very important scientific segment of the market.

Some authors who have concentrated on the history of particular segments of the marketplace of print have discussed the influence of the artists and printers involved in colour printing beyond the nineteenth century as they created such objects as prints, book illustrations, maps and a wide range of other colour printed articles. Besides Ruari McLean, such authors are Percy Muir and Morna Daniels. Based on an exhibition, Eleanor Garvey's *The Artist & The Book 1860-1960 in Western Europe and the United States* (1982) is a work that provides much meticulous detail concerning many of the northern hemisphere western artists that have been involved in book illustration over the century in which British settlement of both Australia and New Zealand was being consolidated, and in which the Antipodean printing industry was developing with its eye still on the northern hemisphere

Plate 2: 'Rose-coloured Pastor, etc.' From H.G. & H.B. Adams, *The Smaller British Birds*, 1874. Printed by Benjamin Fawcett at Driffield.

Reproduced in Ruari and Antonia McLean, *Benjamin Fawcett: Engraver and Colour Printer: With a List of his Books and Plates* (Aldershot: Scolar, c1988.)

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Rose-coloured Pastor, etc.
From *The Smaller British Birds*, 1874.

as provider of not only equipment and expertise, but also of intellectual and artistic stimulus.

As well as those who were directly involved in the printing industry, whether as artists or in commercial printing firms, others who were particularly influential in the development of aspects of colour printing were scientists, teachers, inventors, and engineers. Information on these aspects are widely scattered in the literature, for instance of the history of physics and photography. Perspectives on such people as the scientist James Clerk Maxwell, who demonstrated important principles concerning the mixing of coloured lights, and others who were instrumental in developing such inventions as the half-tone, a break-through for the printing of graphics, must be pieced together from a variety of sources.

Genre and Market

In his lecture, 'The Book in History and the History of the Book', published in 1986 in *The History of Books and Libraries: Two Views*, John Feather's view is that printing should be seen as the hand-maiden of society. Like Michael Twyman, Feather believes that it was the occurrence of major social changes and the demands of the market that drove the industrialisation of printing. Feather's assertion that it is important to give attention to the technical history of printing springs from the tenet that the perception of form influences the perception of the contents of the book. Many authors discuss the theme of market drivers in close association with the technical processes that underpinned the ability for economic production of what the market desired, or in conjunction with an account of the printers and publishers whose business might stand or fall on their ability to correctly gauge that market.

Michael Twyman, in *Printing 1770-1970*, (1970; reprint, 1998) points to market drivers such as the nineteenth century nostalgia for the old illuminated books as being instrumental in stimulating a new demand for colour in that period, citing as indicative the fact that the authors of many of the important printing manuals of the time, including those by Senefelder, Savage and Hansard, all chose to reprint the well-known Psalter initial that had originally been colour printed by Fust and Schöffer in 1457 to display their own printing prowess.²⁷ (Plate 3.) This is fitting since it was this old firm of printers who in the fifteenth century were not only the first to invent a successful two-colour printing process, but were also the first to act in a business-like way in their use of effective advertising, now a staple tool of modern business. In the second part of his book, Twyman has illustrated applicable themes through an historical selection of published pictures that centre about the topics of ceremony, rural life, transport, wars and exhibitions, all of which can be seen as market drivers. Many of these come within the prominent theme of 'Events', the depiction of which

became ever stronger in the twentieth century when the camera enabled the newspaper and periodical literature to further satisfy the demand for news images.

The exclusion of books on botany or ornithology, because there were too many, from R.V. Tooley's survey *English Books with Coloured Plates 1790-1860* (first published in 1954, but reprinted in 1973) underlines the fact that natural history was an important market driver. Fashion as the prime arbiter, often reflected in art, was another major theme identified by Tooley as leading to a demand for colour illustration, while social concerns, travel, the existence of substantial wealth, and the fact that new colour processes such as aquatint and lithography were available had acted as further stimuli.

Throughout the history of twentieth century colour printing, the themes of process and market have been closely intertwined. *Printing in the Twentieth Century: A Penrose Anthology* (1974) edited by James Moran, contains a selection of articles from *The Penrose Annual*, which gives a flavour of the printing concerns of the study period as the twentieth century proceeded, underlining the importance especially to the wider market of a variety of reading matter: many of the articles cover processes that were developed to further the ability to service the needs of this market for a wide selection of colour printed magazines, and, later, for colour printed newspapers in addition to the more expensive books.

An excellent general guide to the literature of that important part of the market, that for the illustrated book, is given by Gwyn Walters in the chapter entitled 'Developments in the Study of Book Illustration', which was published in *The Book Encompassed: Studies in Twentieth-Century Bibliography*, edited by Peter Davison (1992), while a standard work for comprehensive chronological background on the illustrated book is David Bland's work *A History of Book Illustration* (1958, 1969) which is organised by country. For the closer topic of colour illustration in the British tradition, Ruari McLean has written on the coloured book segment of the market, especially that pertaining to the nineteenth century, in *Victorian Book Design and Colour Printing* which was first published in 1963, but which was later enlarged and revised for a second 1972 edition. This is one of the most substantial works on nineteenth century colour printing and its important relationship to book printing and publishing. McLean's account centres around the subject of book design of which

Plate 3: The famous letter 'B' from the *Psalterium Canticis*, 1457. Printed by Fust and Schöffer at Mainz. The first two-colour printing known.

Reproduced in Hendrik D.L. Vervliet, ed., *The Book Through Five Thousand Years: A Survey by Fernand Baudin [and Others]*, introduced by Herman Liebaers; afterword by Ruari McLean (London: Phaidon, [1972]), opposite 356.

(Held: Victoria University of Wellington Library.)

Dñicis diebz post festū trinitatis. Inuitatorium.

Regē magnū dñm venite adoremus, *ps Venite.*
Dñicis diebz post festū ephie Inuitatorium.

Adorem⁹ dñm qui fecit nos, *P Venite añ Seruite.*

Iustus vir qui
non abiit in Evorae.
consilio impiorū et in
via pccōe nō stetit: et in
cathedra pestilēcie nō se-
dit, *S*ed i lege dñi vo-
lūtas ei⁹: et in lege eius meditabit⁹ die ac
nocte, *E*t erit tanq̃ lignū qđ plātātū iste
secus decursus aq̃e: qđ fructū suū dabit in
tpe suo *E*t foliū ei⁹ nō defluet: et oīa q̃cūq̃
faciet p̃sperabūt, *N*ō sic impij nō sic sed
tanq̃ pulvis quē picit ventus a facie terre,
*I*deo non resurgi t impij in iudicio: neq̃
pccōres in cōsilio iustorū *Q*m̃ nōne dñs
viā iustorū: et iter impiorū p̃ibit, *G*ha *P*

colour is but one element, rather than on illustration as such, highlighting such genres of the period as the illuminated gift book.

To integrate some facets of the colour printing market, it is necessary to glean information from a wide range of sources. A particular side of the market, the demand for prints has been discussed in Frank and Dorothy Getlein's 1963 title, *The Bite of the Print: Satire and Irony in Woodcuts, Engravings, Etchings, Lithographs and Serigraphs*, which contains lively discussion concerning the interaction between the content of prints and the print-making processes. Stressing the influence of the innovative artist, many telling contributions from print-makers, some British, are discussed, as well as that market concept, the limited edition. This book brings attention to one market facet which drove a whole segment, referred to as "the shady side of things" and also to the theme of the questioning of power in any form, a topic that has often occupied the print-maker. Another aspect of the print, a by-product of its endurance as a marketable object, has been its potential over the centuries to either obscure or aid communication. This facet was considered by William Ivins in his 1969 title, *Prints and Visual Communication*.

Discussion of the colour printing of maps and its relationship to the marketplace of print has been rare. The topic has been touched on by authors such as Coolie Verner who contributed the chapter 'Copperplate Printing' to David Woodward's *Five Centuries of Map Printing* (1975), in which the technical challenges faced by map printers are discussed. In his more recent article, 'Maps, music and the printer: graphic or typographic' (*Printing History*, 1986), Woodward has discussed some of the technological advances of the twentieth century that enabled map printing costs to be dramatically lowered, so opening up new markets for the map, such background information being important to an understanding of this side of the printing market. Ulla Ehrensverd's chapter in *Art and Cartography* (c1987) provides a historical survey of colour as it was applied to maps.

As a category of print materials, 'ephemera' is of interest in the context of colour printing research, since colour has featured prominently in this side of the market, where it has often assumed, among others, a promotional or advertising role. John Lewis was an early researcher in the area of ephemeral printing, particularly with regard to its typographical side, his *Printed Ephemera: the Changing Use of Type and Letterforms in English and American Printing* (1962) being a pioneering work which has provided valuable information on this less-studied aspect of print culture. Copiously illustrated, this work is appropriately presented via the visual. *Collecting Printed Ephemera* (1988) by Maurice

Rickards, although written from the collector's point of view, contains a useful bibliography. Rickards has indicated a growing interest in this side of print culture history, and from the point of view of their use, has included in his book a discussion of categories of ephemera and the printing methods whereby they have been produced. Particularly interesting are the themes which have emerged as giving clues to the culture in which the various items were objects of daily use, and the market drivers indirectly indicated for disparate print objects: their existence indicates their once commercial viability. Published posthumously in 2000, Maurice Rickards' *The Encyclopedia of Ephemera: A Guide to the Fragmentary Documents of Everyday Life for the Collector, Curator and Historian*, edited and completed by Michael Twyman with the assistance of Sarah du Boscq de Beaumont and Amoret Tanner, has been arranged alphabetically, largely by category of ephemeral item, a feature which allows ease of reference. The copious illustrations in both black and white and colour have assisted this work to "illustrate the field by example."²⁸ Written for collectors, the book by Frank Staff, *The Picture Postcard & Its Origins*, first published in 1966, but with a second edition in 1979, also contains many colour examples, and is particularly useful for tracing the detail of the development of this genre, as is G. Buday's *The History of the Christmas Card* (1954), for these items.

Standards

Closely allied with the above is the question of standards, since the difficulties experienced by printers in achieving cost-effective colour printing has always been closely linked to the need for standards appropriate to the work in hand. Burch (1910) emphasised this theme, bringing out the fact that one important inhibitor to successful colour printing was the difficulty of obtaining good register when overprinting was required. Printing manuals have always had at the heart of their purpose instruction for the trade in order to ensure acceptable standards of printing practice, including instruction on colour printing methods particular to the era, for example, as seen in Joseph Moxon's (1683-1684) *Mechanic Exercises on the Whole Art of Printing*, or in T.C. Hansard's *Typographia* (1825). First published in London in 1882, John Southward's *Practical Printing: A Handbook of the Art of Typography*, deals with several aspects of standards for colour printing practice that were especially relevant to the period under study, including choice of suitable inks. Like Burch's book on colour printing, this manual (reprinted in 1980), grew from a series of practical articles for a trade magazine, in this case, the *Printers' Register*. Another nineteenth century author whose aim was to improve colour printing standards by providing practical knowledge for the colour printer was W.D. Richmond, whose detailed practical instructions for the colour printer of 1885 makes fascinating reading today. *Colour and Colour Printing as*

Applied to Lithography: Containing an Introduction to the Study of Colour, An Account of the General and Special Qualities of Pigments Employed, Their Manufacture into Printing Inks, and the Principles Involved in their Application is a valuable primary source.

Much has been written on William Morris, a man of many parts, and a central figure in any discussion of the foundation of the private press movement or of printing standards, especially those relating to fine printed books and their design, of which colour is but one element. William S. Peterson has edited *The Ideal Book: Essays and Lectures on the Arts of the Book by William Morris* (1982) to allow an appreciation of Morris' point of view on the arts and crafts of the book, a subject very much related to discussions on standards, to spring from his own words. Another author to have considerably enlightened the discussion on this subject, from the vantage point of teacher, was Joseph Pennell, whose *The Illustration of Books: A Manual for the Use of Students* (1896) is a collection of lectures on the subject, in which he not only pithily covers graphic art techniques of the day but also brings insight born of long experience to the cause for improvement of printed illustration standards, whether black and white or colour. One key element as he saw it was the benefit of a closer relationship between artist and printer.

The innate human ability for colour vision is an ability which is in today's mechanised printing environment still called upon to assist in the achievement of high standards of colour printing. The necessity for excellent colour vision was especially vital before the advent of the photomechanical processes, for instance in the chromolithographic era. In order to shed light on the place of human colour vision in print culture, it is necessary to gain an overview of recent research in the area from authoritative authors. Some publications, such as the recent *Readings on Color*, edited by Alexander Byrne and David Hilbert (c1997) introduce many facets of this huge subject. This is a wide-ranging work on many aspects of colour research which is reported in two volumes, one dealing with the philosophy of colour and the other focussing on some areas of the science of colour. *Color Vision* by Leo M Hurvich (c1981) is an important text from an authority on the narrower topic, while the more recent *Theories of Visual Perception* by Ian E. Gordon (2nd edition, 1997) places the study of colour vision within its wider field, explaining approaches that have been taken by researchers who have worked on some of the various aspects of vision research within the area of cognitive science. The title *Colour: Art and Science*, edited by Trevor Lamb and Janine Bourriau (1995), includes a useful and authoritative summary of recent colour vision research. With the advent of modern colour printing methods and the gradual mechanisation of many facets of the technical side of colour printing, titles already

mentioned such as Hunt (1987) and Mortimer (1987), also give valuable information on the question of the development of standards for colour printing.

Aspects of Colour Print Culture in New Zealand

Introduction

At present there are no studies that focus specifically on New Zealand colour printing history: indeed it has been noted in the 1997 publication *Book & Print in New Zealand: A Guide to Print Culture in Aotearoa* (1997), edited by Penny Griffith, Ross Harvey and Keith Maslen, that even for the general history of printing in New Zealand, “there exists at present little or nothing in the form of major general studies.”²⁹ The literature for the topic of colour printing therefore becomes the existing secondary sources on general printing history and that from related fields, primary literature from the period under study, and the printed materials (artifacts) and records that may have survived. For this study the details of the history of New Zealand printers and their colour printing activities have been gleaned from a wide variety of sources, the colour printed materials being particularly valuable, since few records relevant to the printers chosen for more detailed case study research appear to have survived. Secondary sources have ranged through the trade and exhibition literature, the biographical sources and available histories of individual firms, printers, engravers, artists and others that were active in the New Zealand printing industry.

Because the wide variety of New Zealand sources are of varying quality, with most having only passing references to colour printing, a formal review of the literature is not practicable. Instead, this review identifies the kinds of sources that were available and the kinds of evidence that they provided. Themes appropriate to the topic have been derived from the parent European/British print culture literature. Since the literature is also part of the source material for the research, review of the literature has been ongoing, as scattered sources have been identified and come to hand.

Guides to New Zealand Print Culture Literature

Book & Print in New Zealand is invaluable for its timely summary of the state-of-the-art of the subject in New Zealand and is also the only work to act as a guide to the literature of print culture in this country to date.³⁰ Now known as ‘*The Guide*’, this book has identified a wide array of literature under the broad umbrella of the field of the history of print culture in New Zealand, and has been organised largely on the framework of production, transmission and reception that has been mentioned by Keith Maslen and other book historians, and which is in keeping with the Adams and Barker paradigm. The topics chosen cover the medium of print especially as it is embodied in the major area of printed reading

matter; little mention has been made of prints and maps. An extensive bibliography has been provided, as well as an index which points to specific information, including to individual printers. Although in the *Guide* colour printing as a specific topic is not dealt with except in passing, the section on 'Printing and Production' which is inclusive of such topics as printing, the printing trade, the technology and economic matters, provides leads that are especially relevant to the present study.

While *Book & Print* is clearly the most useful single guide to the literature of this subject, other guides to print materials such as prints and maps that are not extensively treated in that work include E.M. and D.G. Ellis' *Early Prints of New Zealand, 1642-1875* (1978), a valuable source which has been based on Bagnall's *New Zealand National Bibliography to the Year 1960* (1969-1985), and *The Directory of New Zealand Map Collections* (1989) which acts as a guide to most existing collections of this genre³¹ and leads on to other sources such as Brian Lovell-Smith's *Maps: A Catalogue of Historical Maps in the Canterbury Museum Library*, (1988), which has been valuable for this study since it includes colour information.

Secondary Literature

Background and Chronology

The only major general history of printing in New Zealand, R.A. McKay's *A History of Printing in New Zealand 1830-1940*, was written at the time of the New Zealand centennial in 1940. This work, published in Wellington, was edited by R.A. McKay for the Wellington Club of Printing House Craftsmen. The organisation is by topic, and includes chapters, for example, on general printing history in the four main centres, Auckland, Wellington, Christchurch and Dunedin. This is the only history to include any substantial coverage of the development of graphic reproduction techniques in New Zealand, a topic that is essential background for colour printing history. The chapter 'Process Engraving', written by McKay himself, provides background information on techniques, equipment and processes, especially those that were introduced in the late nineteenth century New Zealand colonial setting, and includes some reference to the introduction of colour printing processes, but lacks technical detail. Although anecdotal in approach this essay evokes the conditions under which the New Zealand pioneers of graphic reproduction worked, and the link between worker and process brought out by McKay is also particularly salient to the sometimes complicated processes of colour printing.

McKay's history does include examples of colour printing that illustrate the state-of-the-art in New Zealand by 1940. These plates stimulate the desire for further historical

investigation into the question of who have been the influential colour printers since settlement, and what were the antecedents of this aspect of printing in New Zealand. Background information on some of the influential printers of the wider print culture is given in a separate chapter, although not on the colour printers in particular. Another chapter devoted to the Government Printing Office is indicative of the importance of the Government Printer's influence and helps to give perspective to the theme: 'Influential People.' A chapter that was contributed by W.B. Sutch, 'Economic Survey' is a good starting point for research concerning the development of the New Zealand market for print products, while a separate chapter entitled 'Stationery Manufacture' is in keeping with the fact that jobbing printing has played a major role in the New Zealand marketplace of print. McKay's stated objective, "To create the most beautiful book ever to be produced in New Zealand"³² indicates an underlying central concern with standards among the printers of New Zealand. This general printing history, then, confirms that data for this section of the research can be appropriately gathered using a broadly similar thematic structure to that suggested from a study of the parent British colour printing culture.

Processes and Equipment

McKay's 1940 history brings out the technical theme both in the chapter, 'Cavalcade of Printing' in which there is some discussion of printing machinery as well as by reference to technical topics such as the development of the offset process. Both are of significance for colour printing. In the chapter 'Process Engraving' McKay has provided background material on photomechanical methods used in New Zealand which underpinned the development of many colour printing processes, especially in the last decade of the nineteenth century and the early years of the twentieth.

Other information on machines and processes were sought in regional histories, and in books and articles on related topics, as "there have been no general surveys of the development of printing machinery as such in New Zealand."³³ *Printing in Canterbury: A History of Newspapers and Printing Houses of the Province From the Earliest Times* by A.A. Smith (1953) is one such regional study, while *Printed in Auckland: Book Production and Design: Past and Present* (1956) contains some allusion to New Zealand colour printing. As well as to secondary sources, for details of the application of processes basic to graphical printing in New Zealand, recourse to primary trade journals of the period was necessary. (See Primary Sources.)

Information of relevance to this theme was also found in works from other disciplines, such as *The Southern Ark: Zoological Discovery in New Zealand 1769-1900* (1986) by J.R.H.

Andrews and Bruce Sampson's *Early New Zealand Botanical Art* (1985), both of which contain references to colour printing processes such as early New Zealand chromolithographic printing and contain illustrations which are reproductions of examples of historic plates and prints that were originally produced from such colour printing methods.

Influential People

It has been stated that in the New Zealand context of the history of print culture, "the initial task of identifying who was engaged in the trade in any given locality must be pursued through the general sources."³⁴ An invaluable source from the point of view of regional history of New Zealand printing, taken as a snapshot at around the turn of the twentieth century and looking back, is *The Cyclopedia of New Zealand: Industrial, Descriptive, Historical, Biographical Facts, Figures, Illustrations* published between 1897-1908 in six volumes, each one covering a different region, from which people active in the trade were indexed according to occupation. Thus not only printers, but also engravers, including process engravers and those in related trades were able to be located for each region. Systematic searching reveals the prominent New Zealand colour printers of the time by name, for instance, A.D. Willis of Wanganui, and Bock and Cousins of Wellington.

For further biographical information the biographical sources were consulted, *The Dictionary of New Zealand Biography* (1990-), being among the most important, especially, for this study, volume 1 (1769-1869), volume 2 (1870-1900) and volume 3 (1901-1920). Material in this resource, which is now on the web³⁵, is presented to give an insight into the New Zealand cultural context, accessible through headings such as 'Commerce and Trades.' The 1940 *Dictionary of New Zealand Biography* by G.H. Scholefield is another standard source for information on personnel of the printing trade.

The Alexander Turnbull Library's 'Tapuhi' database was searched by names of people associated with the production of printed items held in the collections that are recorded there, and supplementary indexes, for example, the *Biographies Index on Microfiche* (1997) and the microfiche *New Zealand Biographical Clippings, 1890-1988* (1997) were searched for additional information on known colour printers. Sources such as *Nineteenth Century New Zealand Artists: A Guide & Handbook* by Una Platts (1980), and the *Australian Dictionary of Biography* (1966-1996) edited by Douglas Pike and others were useful additional sources while *The Dictionary of Australian Artists: Painters, Photographers and Engravers to 1870* (1992), edited by Joan Kerr, yielded information concerning colour printers who came to New Zealand from the sister colony of Australia. *The Directory*

Directory: The Family, Local and Social Historian's Guide to Contents and Holdings of New Zealand Almanacs, Business, Postal and Telephone Directories, 1842-1960 (1994), by D. Hansen is a valuable finding aid for elusive primary sources such as historical directories and almanacs which are useful for locating additional details.

Although histories of printing firms other than newspaper firms are uncommon, one example that has been published on a long-standing Wanganui jobbing firm is *H.I. Jones & Son Limited, Booksellers & Stationers, Printers & Bookbinders, Wanganui, New Zealand: A Jubilee Souvenir 1861-1961* which is of use for printing history background of this centre where the colour printer A.D. Willis also was in business. An unpublished bibliography of items printed by Lyon & Blair of Wellington between 1874 and 1894 by John Muir, entitled 'Headpieces and Fairytales' (1998), contains clues to some of the lithographic colour printing activities of this firm. W.A. Glue's *History of the Government Printing Office* (1966) adds further perspective to the official arm of New Zealand printing, with information on the successive Government Printers, as well as on many other aspects: colour printing was undertaken at this establishment particularly in the lithographic department. A more recent work by Rachel Salmond, *Government Printing in New Zealand, 1840 to 1843*, published in Wellington by Elibank Press in 1995, has elicited a great deal of information focussing on that early three year period.

Genre and Market

Besides information from the general literature, sources pertinent to this theme include titles that have dealt with the more specific genre, as well as those which have centred on the products that resulted from jobbing printing in which colour has frequently featured, such as postage stamp production and poster printing. Some of the bibliographies in such identified works lead on to other useful sources, such as that in Ellen Ellis' *New Zealand Poster Book 1830-1940* [1970] which features colour reproductions of a selection of historical posters. R.J.G. Collins and C.W. Watts were editors of *The Postage Stamps of New Zealand* published in Wellington from 1938 in five volumes by the Royal Philatelic Society of New Zealand Inc., a work which is a comprehensive survey of the history of postage stamps in this country to that period. Although lacking an index, aspects of colour printing relating to this genre can be gleaned from this work. *All the Stamps of New Zealand* by Laurie Franks has used Collins and Watts as a major source. Largely written from the point of view of a stamp collector, this book first appeared in 1977 and a revised edition was published in 1981. *Alfred Ernest Cousins, A Postage Stamp Die Engraver, Die Sinker, Medallist, Copper and Brass Plate Engraver: An Illustrated Biography* (1980) by Marcel Stanley is an

example of an article that also provides information relating to this side of colour printing history as well as giving details about a local colour printer who was active in this area within the study period.

The scholarly chapter by Anne Kirker entitled 'Lithography in New Zealand, A Coming of Age' in *Lasting Impressions: Lithography as Art* (1988), edited by Pat Gilmour, sheds light on colour printing in relation to New Zealand prints, and provides further references. For passing references to colour printing relating to the cartographic segment of the market, the many titles produced by R.P. Hargreaves, who has extensively researched the history of New Zealand maps, can be searched. For instance *Maps in New Zealand Provincial Council Papers* (1964) and *Historical Maps of New Zealand; A Guide to the Map Exhibition Held in the Otago Museum... August 1964* (1964). Brian Marshall's *Mapmaking and Map Keeping in New Zealand: A Review and Bibliography* leads on to additional relevant titles. The monograph-in-series, 'New Zealand Maps Published in 19th Century Periodicals' (1998), by the same author, is a thorough and valuable key to that aspect: historical maps that were printed as part of other serial publications.

Standards

In the isolation of the New Zealand colonial situation, maintenance of given standards was dependent not only on the possession of suitable equipment and machines but also on factors such as the training of practitioners, knowledge of the latest way of doing things, and communication of ideas and trends from the hubs of printing activity in the northern hemisphere. Keeping up with technical trends was part of the maintenance and improvement of standards, and this was often made possible through the overseas trade journals such as *Penrose's Pictorial Annual* which sometimes contained both articles and passing references to New Zealand printing standards, occasionally demonstrated in the form of colour printed examples from New Zealand printers. Beginning in the last decade of the nineteenth century, this was therefore also a primary source of local information. Local New Zealand trade journals as they relate to this theme are discussed under primary sources. Data relevant to the theme of standards emerged sporadically from many of the secondary literature sources on other aspects of the topic, but especially within the trade literature.

Primary Sources

Data from primary sources obtainable from studying the primary literature, relevant archival manuscripts, and surviving artifacts (print products) from the period, as well as personal memories of practitioners can all be analysed in their own right. Surviving trade records of

relevance may be consulted if available. The evidence of all these primary sources can be used both to provide factual evidence as the basis for research question responses and to provide illustrative examples, for instance of printers' products by genre.

Literature as a Primary Source

Primary sources of relevance include historical publications dealing with printing or containing information recorded during any period under study, such as catalogues from historical printing exhibitions which include colour printing. For this study such items as the *Reports and Awards of the Jurors* (1866) from the New Zealand exhibition held in 1865 was relevant. *Official Record* (1886) from the New Zealand Industrial Exhibition held in 1885 and the New Zealand and South Seas Exhibition *Official Catalogue* (1889) are other such printed sources. As mentioned, the trade journal literature was a rich source of primary material, for example such overseas British journals as *Penrose's Pictorial Annual*, as this publication was known in its early years, and the *British Printer* which sometimes also carried articles dealing with, for instance, the state of Antipodean printing.

New Zealand Trade Journals

Gradually local journals also began to assume the role of informing the trade. One of earliest of these and also the most influential, not only in New Zealand but in the whole of Australasia was Robert Coupland Harding's remarkable *Typo: A Monthly Newspaper and Literary Review Devoted to the Advancement of the Typographic Art and the Interests of the Printing, Publishing, Bookselling, Stationery and Kindred Trades* which has been an important source for the present study. This publication brought a wealth of information to late nineteenth century local printers and was also influential overseas. Published by Robert Coupland Harding in Napier and Wellington between 1887 and 1897, *Typo* was instrumental in improving standards in the industry, particularly in the area of typography, through its educative stance. In the chapter 'Robert Coupland Harding on Design in Typography', published in *An Index of Civilisation: Studies of Printing and Publishing History in Honour of Keith Maslen* (1993), edited by R. Harvey, W. Kirsop & B.J. McMullin, D.F. McKenzie reviewed Harding's great contribution, particularly to this side of printing. Harding had systematically covered every side of typographical design through the successive monthly articles he wrote for *Typo*, often including comment on the element of colour. Published during a period of significant change in the printing industry, *Typo* is not only a New Zealand trade journal but also provides actual examples of colour printing. Since, for instance, it contains colour printed title-pages, advertisements and inserts, it is at once both a colour printed artifact and a valuable primary source. D.F McKenzie drew attention to the importance of the considerable body of primary historical printing material

within this journal, stating that “little of this is now known.”³⁶ He considered that Harding’s contributions to typographical design “probably constitute the most sustained, as well as the most percipient, record by anyone of the type designs issued over those years.”³⁷

Other Australasian trade journals produced during the study period include the *Australasian Typographical Journal* (1870-1916) and the *New Zealand Press News and Typographical Circular* (1876-1879) which was published in Dunedin (the first in New Zealand). It was followed by *The Colonial Printers’ Register* (1879-1880) which was later continued by *Griffin’s Colonial Printers’ Register* (1880-1881). Directories and almanacs are also sources of primary data from the successive printing eras, for example, the *Wellington Almanac* which carried extensive advertising, occasionally in colour for quick effects. Locally published journals such as *The Southern Monthly Magazine*, as well as the New Zealand newspapers, including the weeklies, for instance, the *Auckland Weekly News*, are all primary sources from which information and examples concerning the topic under study were gleaned. Papers from the period sometimes recorded technical details relevant to trade practices of the day, such as the 1875 publication *Photo-lithography as Practised at the New Zealand Government Lithographic Department* by Herbert Deveril.

Artifacts, Records and Archives - Guides to Sources

For print culture, surviving printers’ products are themselves valuable primary sources, as well as archival records from printing businesses, although in New Zealand it appears that in many cases such records have not been preserved. For a survey of New Zealand archival sources of such materials, particularly of archival documents, records and maps, as well as photographic materials, *Archives New Zealand 4* (1992), and the companion volume, *Archives New Zealand: Statistics* (1985), both compiled by Frank Rogers, acted as a comprehensive general guide.

Printers’ products may be grouped according to the genre outlined above: reading matter (includes books, pamphlets, periodicals and newspapers), single prints, maps and ephemera. In addition to tertiary guides to sources of these materials already mentioned, and which provide locations in New Zealand, other finding tools are mentioned below in relation to the particular sources and genre to which they give access. From the identified sources, colour examples were pinpointed for examination from each genre category.

Printers’ Products as Artifacts

Books, Periodicals and Newspapers

Bagnall’s *The New Zealand National Bibliography to the Year 1960* is a basic and comprehensive bibliographical source which indicates holdings for the books and pamphlets

cited. The National Bibliographic Database (NBD) on 'Te Puna'³⁸, the successor to NZBN,³⁹ is worth searching for this category of primary material, since some items, including a few from the nineteenth century not cited by Bagnall, are recorded on the database: for example, items from the lower North Island printer, A.D. Willis. The Alexander Turnbull Library's 'Tapuhi'⁴⁰ database is a major finding aid for much primary material held in the National Library's Turnbull research collections. It is the electronic catalogue of unpublished manuscripts and archives, drawings, prints, photographs, oral history and music that allows identification of holdings for several categories of print materials, including colour plate books that were printed in New Zealand during the period under study, pictorial items and also printed ephemera. The whereabouts of periodicals which may be used to look for the point at which colour processes were introduced in their printing may be located from the *Finding List* and Te Puna – both are valuable resources for locating national holdings, including those not accessible in the Wellington region, for instance, printers' journals held in the Dunedin Public Library. The former, although frozen in 1995, is still worth searching for holdings of the older journals from the period. Ross Harvey's, *The Union List of Newspapers Preserved in Libraries, Newspaper Offices, Local Authority Offices and Museums in New Zealand* (1987) is a useful source for newspaper holdings.

Rather than in the daily newspapers, it was in the special numbers of the weekly newspapers that colour appeared during the period under study: these can be seen more as periodicals. Local holdings of artifacts in this category include those at the National Library, especially the Alexander Turnbull Library, which holds the national heritage of books and periodicals published (and often also printed) in New Zealand. Victoria University's J.C. Beaglehole Room holds many of the major nineteenth century New Zealand colour printed books, while the Hocken Library also holds early books, maps, prints and posters relevant to this study. Another resource of interest is the collection of New Zealand illustrated books being assembled by Rowan Gibbs of Smith's Bookshop, Wellington.⁴¹ Gibbs has also organised the first volume of Bagnall (to 1899) according to printer, publisher and town, a further aid to identification of colour plate books that were produced in particular centres.

Prints

Early Prints of New Zealand, 1642-1875 (1978) is an indispensable source for locating early prints and collations of prints from the press. The Alexander Turnbull Library's department of Drawings and Prints is a major repository of such primary print material, the 'Tapuhi' database now recording the greater proportion of these holdings. Some material from this database is also being made accessible through 'Timeframes', a National Library

website which now contains over 20,000 images⁴², many that were created during the period under study relating to New Zealand. The advantage of this tool is that thumbnail images (in colour where appropriate) of listed items may be viewed, as they have been included as part of the record for the items cited. Tapuhi may be searched not only according to the names of people associated with their production (for example, artists, printers, and publishers), but also according to terms for the printing processes used to produce an item, for example, 'chromolithography' or 'photomechanical prints'. Cross-referencing enables efficient searching, as links, for instance, between printers and their products (which are held in the collections) may be made. 'Tapuhi' records include colour information, some of which must be treated with caution, since the database is not reviewed.

Maps

Directory of New Zealand Map Collections, published by the New Zealand Map Society in 1989 is a general guide to map sources in New Zealand. For information on the nature of some of the important New Zealand map collections, useful research articles are 'The Map Collection at the Alexander Turnbull Library' (1972) by Brian Marshall,⁴³ 'The Hocken Library Map Collection,' by R. P. Hargreaves (1973),⁴⁴ and 'Sources of New Zealand Maps',⁴⁵ also by Hargreaves (1967). A further, although older source is Clifford McFadden's *A Selected Bibliography of Pacific Area Maps* (1940). Brian Marshall's *New Zealand Maps Published in 19th Century Periodicals* (1998), organised by year, usefully indicates whether the map is in black and white or in colour, and is indexed according to publishers, lithographers and printers.

In *Archives New Zealand: Statistics* (1985), Frank Rogers has ranked government archives as the most important repositories of New Zealand maps, followed by art galleries and museums. Many of the maps held in government archives were published in the period under study by government departments, such as the Department of Lands and Survey, and the Government Printer, or by the early provincial governments: the cartographic collection held at Wellington's National Archives, accessible for research, is part of this heritage. However, an important map collection in the Canterbury Museum has been given particularly enhanced accessibility through Brian Lovell-Smith's *Maps: A Catalogue of Historical Maps in the Canterbury Museum Library*, published in 1988. This listing gives dates, publishers, and types of map, and includes atlases of New Zealand. The maps are categorised by subject and there is a section listing the maps printed by the Lands and Survey department, many of which date from the nineteenth century. These lists act as a key to the catalogue entries themselves, which have been meticulously compiled, and include

colour information. The catalogue has also been indexed by names of people associated with the production of the map, such as printer/publisher, and is therefore a valuable resource for this genre, which, for New Zealand, has had less attention from the cataloguer than has been received by other genre such as books.

Ephemera

The 'Tapuhi' database was also searched for ephemera, and is a good starting point for gaining access to the Alexander Turnbull Library's important Printed Ephemera collection, although only a small proportion of the total holdings have been entered to date. However, search capabilities often enabled useful links between genre and printer to be made for many classes of ephemera, such as posters, labels, letterheads and cards, and, as for prints, allowed listings by printing process to be made.

Ellen Ellis's *New Zealand Poster Book 1830-1940* (1970), acted to some extent as a guide to other holdings of colour printed posters. Some locations of these items are the Railways Library, the Hocken Library and the Turnbull Library. (Rowan Gibbs' collection of New Zealand books is a valuable local resource to check for their colour printed jackets, although not within the period of this study.)

Printers' Records and Archives

For printers' records and archival manuscripts of a particular region archival sources must be searched. The Turnbull Library Manuscripts and Archives section is a major repository of non-government New Zealand records holding some manuscript documents and records relating to printers and printing. These may be identified by searching the 'Tapuhi' database as described above, for example, by name of a printing/publishing firm or individual printer. For instance a folder of correspondence pertaining to Robert Coupland Harding, *Typo* and other printing matters is held.

Archives from colour printers of the period under study have generally not survived. The National Archives in Wellington holds records from the Government Printing Office as well as records for such government departments as Lands and Survey and Public Works which both produced maps in the nineteenth century. Some records and documents relating to printers such as Frederick Sears and Bock and Cousins are also held. The New Zealand Regional Museums are important repositories for this class of primary material. Records may be located using the Government Archives Integrated Management System (GAIMS). A project to provide enhanced access to New Zealand archival material is being pursued

from 1999 onwards as NRAM in electronic form (the National Register of Archives and Manuscripts), and in time will result in a more integrated search facility.

Other records that have survived from New Zealand printing firms and organisations are,

- ¹ Of the many bibliographies compiled by Vito J. Brenni some which have provided relevant titles are *Book Illustration and Decoration: A Guide to Research* (1980), *Book Printing in Britain and America: A Guide to the Literature and a Directory of Printers* (1983) and *The Art and History of Book Printing: A Topical Bibliography* (1984).
- ² Note: the London publisher of the 1910 edition I have used was I. Pitman. Page [iv.] of the 1983 reprint indicates that the work had also appeared from an American publisher in 1910: "Originally published: New York: Baker & Taylor Co., 1910".
- ³ R.M. Burch, *Colour Printing and Colour Printers* (London: I. Pitman, 1910), vi.
Note: Held, State Library of South Australia.
- ⁴ R.M. Burch, *Colour Printing and Colour Printers* (1910; reprint, with a new introduction by Joan M. Friedman, New York: Garland Pub., c1982), introduction, x.
- ⁵ Joseph Moxon, *Mechanick Exercises on the Whole Art of Printing*, ed. Herbert Davis and Harry Carter (1683-1684; reprint, London: Oxford University Press, 1962), 300.
- ⁶ Philip Weimerskirch, review of *Milestones in Colour Printing 1457-1859: With a Bibliography of Nelson Prints*, by Bamber Gascoigne, *The Library Quarterly*, April 1999: 264.
- ⁷ Michael Twyman, *The British Library Guide to Printing History and Techniques* (Toronto: University of Toronto Press, 1998), 59.
- ⁸ *Ibid.*, 61.
- ⁹ John Lewis, *Anatomy of Printing: The Influences of Art and History on its Design* (London: Faber, 1970), 64.
- ¹⁰ Michael Twyman, *Printing 1770-1970: An Illustrated History of its Development and Uses in England* (London: Eyre & Spottiswoode, 1970; reprint (London: British Library, 1998), 2.
Page citations are to the 1970 edition.
- ¹¹ Paul A. Winckler, ed., *Reader in the History of Books and Printing* (Englewood, Colo.: Information Handling Services, c1978), foreword.
- ¹² *Ibid.*, 333.
- ¹³ Sebastian Carter, 'Printing and the Mind of Man', in *Matrix*, 20 (2000): 179-180.
- ¹⁴ John Feather, *A Dictionary of Book History* (London: Croom Helm, c1986), 72.
- ¹⁵ University of Delaware Library, *Color Printing in the Nineteenth Century: An Exhibition at the Hugh M. Morris Library, August 27-December 19, 1996*, curated by Iris R. Snyder (Newark, Del.: The Library, 1986). URL: <http://www.lib.udel.edu/ud/spec/exhibits/color/>
- ¹⁶ The British Library, *Aspects of the Victorian Book*, 2001. URL: <http://www.bl.uk/collections/early/victorian/intro.html>
- ¹⁷ Joan Friedman, *Color Printing in England 1486-1870: An Exhibition: Yale Center for British Art, New Haven, 20 April to 25 June 1978* ([New Haven]: The Centre, c1978), 64.
- ¹⁸ *The Chromolithograph* (London: Zorn & Co.): 1: opp. 18.
- ¹⁹ *The Chromolithograph*, 1 (14 December, 1867): illustration opp. 50.
- ²⁰ *Process Work Year Book: Penrose's Annual for 1895*, 1 (1895): last page advertisement.
- ²¹ *Process Work Year Book: Penrose's Annual for...* (London: Land Humphries and Co., Ltd. [etc.], 1895-): 4.
- ²² *British Printer*, 2 (January-February 1889): 1.
- ²³ Pat Gilmour, 'Cher Monsieur Clot...Auguste Clot and his Role as a Colour Lithographer', in Pat Gilmour, ed., *Lasting Impressions: Lithography as Art* (London: Alexandria Press, 1988), 129.
- ²⁴ Pat Gilmour, *Lasting Impressions: Lithography as Art*, foreword, 7.
- ²⁵ Ruari and Antonia McLean, *Benjamin Fawcett: Engraver and Colour Printer: With a List of his Books and Plates* (Aldershot: Scolar, c1988), 7.
- ²⁶ Adam Lowe, ed., *Jacques-Fabien Gautier D'Agoty: The Anatomical Prints: De Couleur et Grandure Naturelles* (Tokyo: Lampoon House, 1996), 6.
- ²⁷ Twyman, *Printing 1770-1970*, 37.
- ²⁸ Maurice Rickards, *The Encyclopedia of Ephemera: A Guide to the Fragmentary Documents of Everyday Life for the Collector, Curator and Historian*; edited and completed by Michael Twyman; with the assistance of Sarah du Boscq de Beaumont and Amoret Tanner (London: British Library, 2000), vi.
- ²⁹ P.A., Griffith, Ross Harvey and Keith Maslen, eds., *Book & Print in New Zealand: A Guide to Print Culture in Aotearoa* (Wellington: Victoria University Press, 1997), 15.
- ³⁰ *Book & Print in New Zealand* is now online at the Virginia Electronic Text Centre: URL: etext.lib.virginia.edu/toc/modeng/public/GriBook.html
Note: A New Zealand site is now also under construction, as at 5/5/02.
- ³¹ G.A. Wood, *Studying New Zealand History*, 2nd ed., rev. by Simon Cauchi and G.A. Wood (Dunedin: University of Otago Press, 1992), 5.

³² R.A. McKay, ed., *A History of Printing in New Zealand 1830-1940* (R.A. McKay for the Wellington Club of Printing House Craftsmen, 1940), preface.

³³ Griffith, Harvey and Maslen, eds., *Book & Print in New Zealand*, 62.

³⁴ *Ibid.*, 69.

³⁵ *The Evening Post*, 21st February, 2002, 17: www.dnzb.govt.nz

³⁶ D.F. McKenzie, 'Robert Coupland Harding on Design in Typography', in *An Index of Civilisation: Studies of Printing and Publishing History in Honour of Keith Maslen*, ed. R. Harvey. W. Kirsop & B.J. McMullin (Centre for Bibliographical and Textual Studies: Monash University, Clayton, Victoria, 1993), 188.

³⁷ *Ibid.*, 188.

³⁸ Te Puna in Maori means "the well."

³⁹ The New Zealand Bibliographic Network

⁴⁰ Tapuhi in Maori means "to nurture" or "to care for"; it is also an acronym that stands for the Alexander Turnbull Library's Automation Project: 'Turnbull Automation Project for Unpublished Heritage Items'.

⁴¹ Griffith, Harvey and Maslen, eds., *Book & Print in New Zealand*, 66.

⁴² As at 22/11/01

⁴³ *New Zealand Cartographic Journal*, 2 no.1 (1972): 3-5.

⁴⁴ *New Zealand Cartographic Journal*, 3 no.3 (1973): 8.

⁴⁵ *New Zealand Libraries*, 30 (1967): 41-47.

⁴⁶ Griffith, Harvey and Maslen, eds., *Book & Print in New Zealand*, 51.

SECTION I

An Historical Study of Colour Printing In New Zealand

CHAPTER 2

SIGNIFICANCE OF THE STUDY, THEORETICAL FRAMEWORK, RESEARCH QUESTIONS AND METHODOLOGY

Significance

The gap in the literature concerning the development of colour printing in New Zealand is indicative that the present study is necessary, given that colour is now such an important aspect of modern printing. As an aspect of print culture, the study is also timely in the light of the recent establishment of a project to look at a number of facets of the subject of book and print culture in the New Zealand setting. In recent years there has been more emphasis on the visual dimension of print culture.¹ Research into colonial New Zealand colour printing and its links with both the neighbouring Australian colonial print culture and the parent British culture enlarges understanding of this important visual element. Being exploratory, the research begins analysis, interpretation and documentation of this particular corner of New Zealand print culture history, and provides a portion of the chronological and factual basis for future more detailed research. In a field where many of the source materials are fugitive or lying under-used, there is the danger that some may disappear, for instance, through fire, or library culling. For this reason, too, it is timely to commence research into New Zealand colour printing history.

Apart from the suggestion of a general framework of production, transmission and reception for the study of the history of New Zealand print culture, no single best way to approach the subject has yet been advocated as a basis to carry out an analytical study. Therefore, a thematic framework appropriate to the present colour printing study has been developed as part of the research to act as an effective and appropriate organising principle. The framework is based on themes which not only have emerged from the relevant literature but which are appropriate to an historical print culture study that centres in the 'production' phase of the Adams and Barker book cycle (shown as figure 1), although some account is taken of relationships to other phases represented within that model.

Theoretical Framework

The Historical Approach

Mauch and Birch (1998) point out that research projects in a given field should follow a mode that is normal for work within that subject.² This thesis is set within the field of printing history, which, as part of the history of print culture, is also a branch of mainstream history, and therefore adopts the standard conventions of historical research. John Tosh, an authoritative writer on the conduct of historical inquiry, asserts that such mainstream history “continues to account for a great deal of first-rate historical work and to dominate academic syllabuses.”³

The essence of traditional historical procedure is to first identify relevant sources, and to critically study them in order to gather an array of factors salient to the study. These factors are then analysed to show relationships, interactions and changes over time, so that their significance may be evaluated, and, in view of the fact that answers can seldom be final and absolute, tentative answers to formulated research questions proposed. Sources must be viewed with both internal and external criticism. Lyn Gorman (1997) sets out steps to be taken to ensure that sources are what they purport to be, and to assess their reliability.⁴ To avoid the perpetuation of myth, wise practice includes the critical consultation of as wide a range of sources as possible. The need is to guard against error, and to this end historians have articulated standards for evidence, under which the ideal situation would be “to find independent corroboration for any proffered fact.”⁵

Essentially the historian’s job is to tease out: What happened? What did it feel like to be there? Why did the events occur? What were the resulting changes? That is, a history essentially provides practical explanations of the past. John Tosh (1991) sees the task of the historian as being “to identify trends, to analyse causes and consequences - in short to interpret history as a process and not just as a series of brightly coloured lantern-slides.”⁶ An important aspect of the historian’s task is to appropriately report findings, for which purpose “the three basic techniques of description, narrative and analysis can be combined in many different ways.”⁷ The New Zealand academic historian Miles Fairburn (1999) comments that “there are a multitude of ways a good writer can combine analysis with narrative.”⁸ John Tosh explains that, in general, the fact that the historian must variously employ these three modes results from “the tension which lies at the heart of all historical inquiry between the desire to *re-create* the past and the urge to *interpret* it”, and that in general, variety of historical writing is engendered because “narrative and description address the first requirement, while analysis attempts to grapple with the second.”⁹

Lyn Gorman succinctly sums up the historian's dual task as: "1. to convey a sense of time or to show chronological development [and] 2. to analyse and explain the interrelationships of the events studied, to detect underlying patterns, to unify the various elements [into] a satisfactory whole which provides a response to the initial research problem." The resulting account should therefore contain "a mixture of two styles: narrative, or a chronological approach, and analysis, or an approach by topic."¹⁰ There has been much discussion concerning the place of narrative and chronology in history, but in the end both are natural modes of human understanding, especially the retrospective understanding of the past, because we are ourselves temporal beings. The human affinity for narrative is intrinsic: our lives all have a beginning, a middle and an end. The construction of basic narrative and chronology is needed to give a basis for placement in context, and to reveal links and relationships, which can in turn explain paths along which influences have been transmitted. On the other hand, the demonstration of a lack of links, could explain idiosyncratic development.

Historical research at present is not characterised by agreement as to any over-arching proper theoretical approach. Dennis Trinkle (1998) has commented that the discipline is in a period of intellectual confusion, best described as a fragmentation of approach.¹¹ John Tosh remarks that, for historians, the use of theory as such has been a matter of great controversy, but that if wisely used, can nevertheless be seen as a valuable tool. To this end, the formulation of hypotheses and/or research questions can provide a useful approach, amounting to the application of appropriate theory, for instance, to test available evidence in order to give provisional explanations, while reducing the risk that findings may be biased towards constituting initial assumptions.¹² David Madsen (1992) states that the usual mode for the historian is most often the non-experimental qualitative approach: "the historian, for example, must use a non-experimental approach because she cannot re-create the personalities, events, and conditions that combined to produce historical record."¹³ However, that is not to say that if useful to problem solving a statistical approach should never be taken, but that appropriate tools for a particular study should be used, to allow enrichment and supplementation when warranted.

Since the rise of the 'New History' last century to allow for an approach that could be not only characterised as attempting to "follow the fate of nations" but also which would allow the "habits and emotions of the most obscure individual"¹⁴ to be taken into account, various schools of thought have arisen and a range of approaches has been taken by historians

within the schools, two influential groups being the 'Annales' school and that of 'Mentalities'. Robert Fogel and G.R. Elton have set out some of the differences in modes of thought across the historical spectrum in *Which Road to the Past: Two Views of History* (1983). It is not my purpose to discuss the development of these schools of thought, both of which have influenced subsequent developments in the academic discipline of the History of the Book, but to comment that the admission to legitimate historical thought of a greater range of approaches has also opened up a greater range of possible source material, from the particular to the general. In these circumstances, in order to deal with the analysis and evaluation of a wide range of data, historians advocate a thematic conceptual approach in which the themes may be chosen to act as the framework and organizing principle which is necessary for a scholarly interpretive analysis (and later synthesis) of the research data, and to enable as systematic and objective a methodology as possible.¹⁵ Lyn Gorman comments that subheadings also allow organisation at the data collection stage, if these "reflect a breakdown of the research problem"¹⁶ and that such an organisational framework may also facilitate the inclusion of new questions that may arise during the course of research.

The Australian academic historian, Wilfrid Prest (1999), has said that current historical methodology uses a combination of approaches: "Many historians are now more concerned with interpreting the cultural meanings of the past than to narrate and explain the causes of past events (although the best manage to combine these roles)."¹⁷ Thus the tools of chronology and narration can be used to point to patterns of cause and effect, as well as being a basic framework on which to hang thematic studies of aspects of micro-history in greater depth and which attempt to analyse the evidence, put forward feasible interpretations of the historical situation and draw out empathetic cultural meanings.

The New Zealand historian, Miles Fairburn (1999), advocates that to take advantage of the possibilities now open to historical research, some of the tools and concepts of social history can be employed to advantage, for instance, to combine the hermeneutic with the naturalistic approach, both stances being useful according to the circumstances and stages of the historical inquiry, while diluting the disadvantages inherent in each. Hence an overall eclectic method is often an effective and appropriate strategy. At the stage of consulting primary sources, in order to inform the conceptual framework of a study, a hermeneutic¹⁸ approach can help to guard against 'presentism', by making the effort "to understand the concepts of a society (or a subsection of it) in the same way as it understood them itself."¹⁹ Fairburn points out, however, that such an approach is not adequate on its own, for a variety

of reasons. For instance, one reason is that "an insider's view cannot easily, if at all, account for the unconscious structures that constrain the range of options available to the actor in any given situation", and another is that for explaining "human events and states of affairs which impinged on the society and of which it had no knowledge," or for explaining forces "which the society may have vaguely felt but had no concepts for (such as microbes)", the hermeneutic framework would be unreliable.²⁰ In such conditions, Fairburn states that "it is perfectly legitimate to use our concepts embodied in our theories to describe and explain the society."²¹

In the conclusion to *The Pursuit of History: Aims Methods and New Directions in the Study of Modern History*, John Tosh says of history that:

now more than ever it can only be adequately characterized in terms of paired opposites. It concerns both events and structures, both the individual and the mass, both mentalities and material forces. Historians themselves need to combine narrative with analytical skills, and to display both empathy and detachment. Their discipline is both re-creation and explanation, both art and science; in short...history is a hybrid which defies classification. These distinctions should be seen not as warring opposites but as complementary emphases, which together hold out the possibility of grasping the past in something like its real complexity.²²

Recent Approaches to the Study of the History of Print Culture.

The variation in point of view that is apparent among scholars working on the history of print culture is the result of input from a variety of influences, reflecting not only cross disciplinary approaches, but also variations that have their root in the distinctive scholarly traditions that have come from the different national schools of thought. The 1988 article 'New Directions in Book History' by John Feather, published in the *Bibliographical Society of Australia and New Zealand Bulletin (BSANZ Bulletin)*, is an excellent summary of the origins and significance for print culture history of some of the directions that have been taken, and some of the issues that have been hammered out over the last few decades as the discipline of the history of print culture (or the history of the book) has matured.²³

Particularly influential authors have been Lucien Febvre and Henri-Jean Martin who, in an authoritative and comprehensive study entitled *L'Apparition du Livre*, first published in Paris in 1958, brought a fresh view to the subject. Febvre's 'Annales' school employed a broad approach to include the many facets of cultural influence that have interacted in any period under study to allow a more all-embracing account of print culture. Febvre and Martins' study of book history to 1800, later published in English in 1976 as *The Coming of the Book*, a landmark, can profitably be consulted for background information, although the chronology span stops short of the period of the nineteenth century when colour printing began to come into its own.

Part of this new approach to book history was to locate the historical artifacts in the economic, intellectual and social context of the world from which they came. Philip Gaskell was one of the first English authors to examine the book as an historical object in his *A New Introduction to Bibliography* (1972). The bibliographic treatment allows the reader to empathise with the history of problems of printing and printers as seen from the perspective of their own times. For example, with regard to colour printing, Gaskell details the difficulties experienced by early printers in accomplishing even the simplest two colour printing to obtain copy printed partly in red and partly in black.²⁴ This book leads on to many secondary sources through its extensive bibliography.

Elizabeth Eisenstein, well-known for her 1979 title, *The Printing Press as an Agent of Change*, is an author who has taken the wide historian's view with her thought-provoking study. In the later abridged title, (without the footnotes) *The Printing Revolution in Early Modern Europe*, (1983, 1993), Eisenstein alludes to S.H. Steinberg's assertion of the importance of the influence of printing, but finds that this has been a hitherto under-recognised factor in mainstream history. This gives room for Eisenstein to highlight the significance of the interactions of print culture with such important historical eras as the renaissance and the reformation as well as its role in other far-reaching changes such as those which were consequent on the advent of the scientific mode of thought.

Adrian Johns gives an exposition of the way in which the evolution of scientific thought was bound up with the history of the book. In a recent work, *The Nature of the Book* (1998), he shows that the ever-changing cultural context in which books were created affects meanings and interpretations: the book as vehicle is the mediator between author and reader. However, Johns takes issue with Elizabeth Eisenstein's view (1979) that printing brought a revolutionary 'fixity' to texts, in turn important to the scientific revolution, demonstrating that the road to the reliable and the uniform, both desirable print attributes for scientific communication, was much longer, and was achieved by a slower evolutionary process.

In his article 'Cross-channel Currents: Historical Bibliography and L'histoire du Livre,' published in 1980 in *The Library*, John Feather described the contrasting approaches that had been taken on the one hand by Anglo-American scholars, characterised as book centred, or bibliographical, and the culturally-based approach of French scholars who had rich documentary sources available, but without the emphasis on books, and shows how cross-fertilisation can occur by combining artifact-centred scholarship with the skills of historical

and cultural scholarship, to produce an enriched middle ground. In his later article, Feather (1988) traced the history of the subject from its intellectual beginnings in Bacon's concept of 'historia litteraria' which initially caught on in Germany where the history of the book, including the history of printing, first became a serious subject for study, through the traditional 'bibliographical' schools of thought that developed from book collecting and the subsequent need for antiquarian book cataloguing, particularly in France and England. Feather attributes to Febvre and Martin's influence a broadening of the subject in France, as well as the intellectual swing away from pure bibliography, which influenced subsequent research directions particularly in England and America, especially through scholars such as Robert Darnton and the New Zealander D.F. McKenzie. Darnton's 'What is the History of Books' (1983) was seminal in bringing a modelling approach to the construction of theoretical and conceptual frameworks for the subject, while D.F. McKenzie's 'Printers of the Mind: Some Notes on Bibliographical Theories and Printing-House Practices' (1969) sounded a methodological warning by demonstrating that some findings of analytical bibliography that had been produced through the blinkered use of inductive research methods were erroneous, and showed through his own work that besides using bibliographic evidence, there is also the need to take account of the actual printing processes and printing house practices by obtaining other evidence if possible. Corroborative evidence may come from other archival primary sources such as printers' records, if available.

This criticism paved the way for a future middle ground for research in the discipline between a pure bibliographical approach on the one hand and a comprehensive, social historical view on the other. An advocate for the use of a deductive methodology for print culture history, McKenzie lucidly discussed the need for the researcher always to keep an open mind, while at the same time, by using Cambridge University printing archives as evidence in his research, demonstrating the efficacy of his methodology. McKenzie said: "the evidence is consistent with my belief that we should normally proceed in our inquiries by the hypothetico-deductive method which welcomes conjectures in the positive knowledge that productive conditions were extraordinarily complex and unpredictable, but which also insists that such conjectures be scrutinized with the greatest rigour and, if refuted, rejected."²⁵ Robert Darnton was one of the most prominent researchers to use printing archives as evidence in his 1979 study, *The Business of Enlightenment* for which he drew on the Neuchatel archives of the Typographical Society. The New Zealander Keith Maslen had also used this approach for his 1952 thesis on the Bowyer paper stock ledgers.

Thought in the various strands of the history of print culture studies since then has been further developed by authors such as these as well as by other contributors. In his 1985 Panizzi lectures, entitled *Bibliography and the Sociology of Texts*, D.F. McKenzie introduced the concept of a diversification of the idea of 'text' to include all printed forms, and encouraged the view that studies of the interaction of 'texts' and society would be an important source of cultural history, and must include not only functional investigation, but also the processes through which 'texts' came into being, including their means of production. McKenzie's term the 'sociology of the text' became the intellectual slogan for the new breed of book historian.

From the viewpoint of the textual bibliographer, G. Thomas Tanselle called for an intellectual middle ground, suggesting in his paper 'The Bibliography and Study of American Books,' reprinted in *Needs and Opportunities in the History of the Book* (1987), that both the bibliographer and the book historian could benefit from taking note of each others' evidence, so that the connections between content and the printing processes involved in the 'production' side could inform the influence of books on social and intellectual life, and vice versa. Tanselle's was one of six essays that had originally appeared in *Proceedings of the American Antiquarian Society* (volume 94, part 2 through volume 96 part 1). The paper by William S. Pretzer, 'The Quest for Autonomy and Discipline: Labor and Technology in the Book Trades', which looked at the history of the book trades as part of the history of labor and technology, saw 'technology', when considered in this context, as both an arena and a weapon. This paper appeared in the same publication, along with one from Michael Winship 'Publishing in America: Needs and Opportunities for Research.' As well as outlining some research needs in the area, including the need to use as many different types of source materials as possible for print culture studies, the need to locate and interpret primary sources, and to continue the work of establishing the record of the published output, Winship turned his attention to constructing a model to distil essential publishing relationships. With publishing shown at the centre of activities, closely allied to creation and manufacturing through one axis, and distribution and financing through the other, Winship acknowledged that in America "all publishing activities also took place within the larger matrix of American society and culture, and were influenced by intellectual, economic, and political trends and forces."²⁶

Now characterised by a diversity of approach, evolution of print culture scholarship continued in the decade of the nineteen nineties, and is reflected in the literature with further

papers from scholars such as McKenzie, Tanselle and Winship, as well as fresh directions in the mapping of the subject from others such as Thomas Adams and Nicolas Barker, whose "A New Model for the Study of the Book" was published in 1993 in Britain in *A Potencie of Life: Books in Society*. (See figure 1.) Considering 'the communications circuit' model that had been suggested by Darnton to be more appropriate to the study of the history of communications, and taking the view that an appropriate framework for print culture studies was not the same as a model appropriate to social history, Adams and Barker constructed a new model for the study of 'the book', which this time placed 'the cycle of the book' consisting of the events of publishing, manufacturing, distribution, reception, and survival at the centre, surrounded by socio-economic influences. A definition of 'the book' is offered as "something printed or written in multiple copies that its agent, be it author, stationer, printer or publisher, or any combination thereof, produces for public consumption."²⁷

In his 1992 article, 'History of the Book', a contribution to *The Book Encompassed*, D.F. McKenzie traced the development of the now apparent diversity of research and research approaches in the subject, summing up the interpretation of the place of all forms of 'the book' as pointing to 'conditions', and as such, being powerful means of recovering the past, so that 'the larger plan' of print culture studies or history of 'books' is "what their production, dissemination and reception reveal about past human life and thought."²⁸ Dismissing argument concerning the place of narrative and analysis in history as an insoluble problem,²⁹ McKenzie saw as commonsense the fact that 'the book' as a physical object or artifact should be regarded by researchers as indispensable evidence of its history, and that changes in the physical form indicate changes in the conditions of reception which are to be interpreted by the historian.³⁰

Michael Winship (1995) has given an overview of two main approaches to the study of print culture in the American setting, where the project 'History of the Book in American Culture' was established in 1983. In the paper 'The Art Preservative: From History of the Book back to Printing History,' Winship encouraged the study of printing history, which had been somewhat submerged in the new diversity, as worthy of a renewed research effort to enable fresh insights into that part of the cycle of the book, the production phase, but on a middle ground, taking advantage of both the new print culture approach and the best of the more traditional approach. In a prefatory section, Winship cited points previously made by David Hall³¹ who has characterised former American research in this field as printing history often organised by place, and focussing, for example, on production and printers,

craftsmanship and fine printing, and which he viewed as limiting to the wider view being taken. This wider view was seen by Hall as embodying an interpretation of printing to include its relationship to American politics, culture and society. Hall envisaged that future themes for researchers might include “readers and reading, popular culture in its multiple dimensions, texts and textuality, power and the structures of authority embodied in print.”³²

On the other hand, Winship cites the vision of the printing historian Rollo Silver as exemplifying the best of the more traditional approach, as expressed by Silver in a 1977 lecture ‘Writing the History of American Printing’, in which he had called for a variety of areas to be addressed. These included the need for effort to develop relevant bibliographic aids, more work on the industrial setting of the nineteenth century, collaboration between printers and historians and attention to a scholarly mode. Winship comments that many of these pointers were now being followed, but that in addition, he believes that some leaves from the book of the newer approach to print culture set out by Hall can profitably be taken to make future printing history “just as exciting and relevant”³³ as the agenda set out by Hall for wider print culture studies. However, Winship also believes that part of the basis of any history of book and print culture should be informed by the current approaches to printing history that were fired by Silver’s words, so that vague generalisations are avoided, while still addressing broader cultural and social issues.

In the same year, Tanselle focussed on the same issue, but from the analytical bibliographical perspective, in his article ‘Printing History and Other History,’ in which he encourages the use of archival materials, asserting that “our best chance of capturing the human spirit, as it has existed in different times and places, is through studying the artifacts that it has produced, reading their significance in the light of how they came into being. Printing history is essential for examining a major class of those artifacts by helping us to decipher, in the fullest way possible, the physical marks that constitute verbal messages from the past.”³⁴

Within the growing push towards projects aimed at publishing national histories of print culture, scholars have outlined agendas. This has included New Zealand scholars in the field, such as Keith Maslen, whose suggested broad themes of production, dissemination and reception, adopted from D.F. McKenzie (1992), and mentioned in the 1993 article, ‘Towards a History of the Book in New Zealand’,³⁵ approach a conceptual framework for such a history that fits with the Adams and Barker model. In his 1988 paper John Feather

mentioned a similar concept that had been embodied in Richard Altick's *English Common Reader* as far back as 1957:

Altick's book is particularly instructive in this respect. Two chapters are concerned with the history of the book trade, and aspects of trade history appear throughout the book; he is writing about books as cultural objects, but recognises that their cultural significance is determined by the commercial pressures which are implicit in their production, distribution and sale.³⁶

A 1998 article on the state of the discipline by Wallace Kirsop refers to both the Darnton and the Adams and Barker models as providing a general theoretical context, and agrees that the tripartite thematic scheme mentioned by Maslen and "commonly identified by historians" would be a convenient organizing structural principle for the 'History of the Book in Australia' but warns that such a framework "should not create artificial and arbitrary barriers to research across the range."³⁷ The Australian history has now begun to appear, the title *A History of the Book in Australia, 1891-1945: A National Culture in a Colonised Market*, edited by Martyn Lyons and John Arnold, being published in 2001.³⁸ Kirsop's 1998 article, entitled 'Booksellers and their Customers: Some Reflections on Recent Research', published in *Book History* Volume 1, points to future areas of research mainly in the area of 'distribution', but many of the succinct general observations apply also to the wider field, including the corroboration of the fact that there is now enormous diversity in the field of contemporary print culture studies, that there is a need for bibliographic guides for the subject, and that the exploitation of a wide range of evidence will be beneficial to research. For instance, speaking of the use in German-speaking countries of early trade magazines as a resource for research, Kirsop asks, "Have we done enough to exploit this resource in other parts of the world? Australia is not alone in having to give a negative answer to this question."³⁹

Published in 1996, the paper by the British scholar David McKitterick, 'Perspectives in Two Hemispheres: Approaches to the History of the Book in New Zealand' was first presented in the previous year at the first New Zealand History of the Book conference held at the University of Auckland. McKitterick gives pointers for possible research directions in this country, including the need to look at relationships between what was printed locally and what was imported, and the need to set questions around such topics as "what was brought to, bought in, made in, exported from and read in New Zealand."⁴⁰ McKitterick also suggested in this article that vital links should be studied, including those to both Britain and Australia, and urged that we should be asking "not only about the book in New Zealand, and how its writing, production, distribution and use was achieved....," but also

how 'the book' "fits into a world of images – whether paintings, drawings or photographs, or film and television....".⁴¹

In his 1988 historical survey John Feather remarked that the fact that some of these relatively recent developments, such as photography, recorded sound and television, have caused a media revolution has shown that the sound and visual images we absorb are also potent cultural influences, thus giving credibility to the power of other influences and traditions such as the aural and the visual.⁴² Clearly, the visual memory as it has been manifest through print traditions must have also been an influence on the culture, and conversely, reflects the culture as a shaping force on print products and the ways in which they have been produced.

The present research falls within the printing history aspect of the history of print culture, or the history of the book. Michael Winship, whose own career has followed a path from printing history study, through the new territory of history of the book and print culture, and now back again to printing history research, stated: "I hope to point the way that printing history might proceed in future."⁴³ In the second part of his 1995 paper, 'The Art Preservative', in order to both fulfil the idea of a middle ground and to extend the vision for this area of scholarship, Winship outlines directions, themes and concepts for future printing historical research. Some of these are illustrated via reference to his study of the nineteenth century Worcester printing firm of Charles Hamilton. Winship is of the opinion that for printing history it will be salutary to seek surviving records of printing firms for use as source material, saying that "we need more work with primary materials, printed and manuscript, [and] more case studies."⁴⁴

It can be observed that many historical changes, including social changes, have gone hand in hand with underlying technological changes, and for printing history this is a key factor, as new means of production opened new ways of communication. Not least among such changes was the development of the means to provide printed colour as a tool of visual communication, especially in the nineteenth century. Winship indicates that research questions to be asked within printing history studies should cover topics such as biographical details and career paths of printers, nature of the printing business, what machinery and processes were in use, and what range of print materials were produced. Winship's themes constitute a framework that is relevant for research into printing history, and which have been drawn on for this study.

In the article 'Announcement: A History of the Book in Australia', (*BSANZ* 17 no.4 (1993): 203-206), it is acknowledged that for this project, "production, distribution and reception would need to be given equal weight."⁴⁵ In the absence of any other established framework for the New Zealand history of print culture in general, this proposed tri-partite structure which meshes with the new model for the study of the book suggested by Thomas Adams and Nicolas Barker (1993), which has been mentioned by the New Zealand book historians D.F. McKenzie (1992) and Keith Maslen (1993), and which has also largely underpinned the structure of *A Guide to Print Culture in Aotearoa* (1997), provides a good starting point. Part of the research methodology has been to develop such a model further to provide a conceptual framework to be used for this study, particularly the portion that is central to the present topic, the production phase of the book cycle. Incorporating themes that have emerged from the literature, this has acted as an organising principle for the research, and as the arena in which salient research questions have been posed.

RESEARCH QUESTIONS

Printing was a northern hemisphere invention and was a technology that was subsequently transmitted to the southern hemisphere. In the nineteenth century, as technical changes were opening up new possibilities for European colour printing to serve a more diversified market, New Zealand had become a colony of British settlement. During that time much printing technology was brought to New Zealand from the British parent culture, so that the research questions for this study aim to explore the development of colour printing in New Zealand particularly in relationship to that British heritage, with side-glances to its Australasian setting.

Primary Research Question

To what extent was colour printing in New Zealand an offshoot of British colour printing and how closely did development and business patterns follow the parent print culture, particularly in such aspects as the technology, the practitioners, the products and the markets within the period under study?

Thematic Research Questions (See figure 4.)

To answer the questions within the study, it has been necessary to establish some comparisons and contrasts between the British experiences of colour printing and the colonial experiences in New Zealand. The initial establishment of an order of events facilitated interpretations such as divergences, correlations and comparisons. The establishment of basic chronological context has therefore underpinned the direction of this research as an interpretive thematic study of aspects of New Zealand colour printing history.

For example, after establishing a chronology of developments in Britain and New Zealand, analysis has allowed discernment of, for example, significant differences in the speed of the application of particular processes and machines, and in the kind of colour printing which was produced locally. With this baseline established, material collected under other

Thematic Research Questions in Relation to the Primary Question.		
Theme	Segment of Primary Research Question	Research Question
Chronology & Background	How closely did early New Zealand colour printing development follow the British?	<p>1. What were some of the relevant background cultural factors operating in Britain and in New Zealand during the period, and how were they impinging on colour printing developments.</p> <p>2. Within an Australasian context, how did the early development of colour printing to the time of the establishment of chromolithography in New Zealand compare with developments occurring in the British culture?</p>
Processes & Equipment	To what extent was colour printing in New Zealand an offshoot of British colour printing in such aspects as...the technology...	3. What was the range of colour printing possibilities available over the period to British printers? Which ones were taken up by New Zealand printers and which ones were not; which ones were adopted quickly and which were adopted slowly, and what were the reasons?
Influential People	To what extent was colour printing in New Zealand an offshoot of British colour printing, in such aspects as the practitioners...	<p>4. Who were colour printers in New Zealand during the period, especially in the lower North Island; and did the nature of their career paths, skills and business aspirations typically diverge from those of their British counterparts during the period under study? If so, how?</p> <p>5. What problems did the colonial New Zealand colour printers encounter compared with their British counterparts, and what solutions did they devise to overcome these problems?</p>
Products & Market	To what extent was colour printing in New Zealand an offshoot of British colour printing in such aspects as...the products and the markets...	6. What were the colour print products and market drivers for colour printing in New Zealand, and how did they differ from the colour print products and market drivers in Britain? How did the New Zealand colour printers respond to these market differences?
Standards	How closely did New Zealand development follow the British?	<p>7. What has been the role of standards in colour printing? What advice was being given to printers concerning excellence of standards for colour work and how did New Zealand colour printing standards over the period compare with those in Britain?</p> <p>8. What part has colour vision played in colour printing production, and why has an understanding of the mechanism of human colour vision been important to colour printing standards?</p>

Figure 4

applicable themes has been analysed to indicate tentative answers to the questions and to supply provisional explanations. In addition, establishment of colour printing landmarks has been essential as the basis for analysis and assessment of some of the similarities and differences of the New Zealand experience (within the Australasian regional setting) viewed against the characteristics of the British parent culture from which New Zealand printing was first derived, and has allowed observation of some divergence that occurred over time from the traditions and directions of that parent colour printing. To further explore selected aspects of colour printing in New Zealand, closer study has been made of some of the colour printers operating in the lower North Island of New Zealand, with a case study of A.D. Willis of Wanganui and emphasis given to Bock and Cousins of Wellington. A particular study of colour as it appeared in relation to the newspaper weeklies has also been made.

The research questions fall into the following thematic areas of inquiry:

Relative Chronology and Background

1. What were some of the relevant background cultural factors operating in Britain and in New Zealand during the period, and how were they impinging on colour printing developments.
2. Within an Australasian context, how did the early development of colour printing to the time of the establishment of chromolithography in New Zealand compare with developments occurring in the British culture?

Processes and Equipment

3. What was the range of colour printing possibilities available over the period to British printers? Which ones were taken up by New Zealand printers and which ones were not; which ones were adopted quickly and which were adopted slowly, and what were the reasons?

Influential People

4. Who were colour printers in New Zealand during the period, especially in the lower North Island; and did the nature of their career paths, skills and business aspirations typically diverge from those of their British counterparts during the period under study? If so, how?
5. What were some of the problems the colonial New Zealand colour printers encountered compared with their British counterparts, and what solutions did they devise to overcome these problems?

Products and Markets

6. What were the colour print products and markets drivers for colour printing in New Zealand, and how did they differ from the colour print products and market drivers in Britain? How did the New Zealand colour printers respond to these market differences?

Standards

7. What has been the role of standards in colour printing? What advice was being given to printers concerning excellence of standards for colour work and how did New Zealand colour printing standards over the period compare with those in Britain?

8. What part has colour vision played in colour printing production, and why has an understanding of the mechanism of human colour vision been important to colour printing standards?

METHODOLOGY

Introduction

As European printing technology evolved and was later transported to other parts of the world, the diffusion of printing to America and to Australasia was associated with the European colonisation of these parts of the world, as mentioned. For New Zealand and Australia, the history of printing, and more particularly of colour printing, has therefore to be seen as initially embedded in the history of British printing, although with acknowledgment that there was some inheritance from continental Europe and added influence from North America. For example, in the North Island of New Zealand early French missionary printers were active at Pompallier House in the Bay of Islands.

There has been relatively little investigation by academic historians specifically into the history of British colour printing in the European setting, or of the history of its development in any one country and the links to others, and until recently there have been relatively few scholarly works on the history of colour printing by genre. Existing works have treated many specialised aspects, for instance Victorian colour illustration, or technical matters, such as the photomechanical revolution in the wake of the discovery and application of photography to printing in general. Of the works giving a wider treatment, Burch's 1910 *Colour Printing and Colour Printers* is not recent, and does not cover colour printing of maps. The more recent *Milestones in Colour Printing 1457-1859: With a Bibliography of Nelson Prints* (1997) by Bamber Gascoigne is in the form of published lectures with the main focus on the firm of Nelsons: it does not include a bibliography, and only a very few passing bibliographic references. The Australian history, which is more contemporaneous with the New Zealand experience, has in the past not had concerted

attention, although for example, Thomas Darragh has researched aspects of the topic concerning the establishment and development of engraving and lithography in Melbourne and of the colour printing of Australian maps. Other works on subjects relating to book and print are appearing in connection with the History of the Book project now in progress in Australia, and in New Zealand from the analagous History of Print Culture project currently being pursued. Graeme Johanson's *A Study of Colonial Editions in Australia, 1843-1972* appeared in 2000 to give insight into this aspect, while *A Book in the Hand: Essays on the History of the Book in New Zealand*, edited by P.A. Griffith, Peter H. Hughes and Alan Loney was published also in 2000.

The bibliographical guide compiled by Vito Brenni, *The Art and History of Book Printing: A Topical Bibliography* (1984) has a section containing nineteen titles specifically on colour printing, but these have been chosen for their focus on particular processes, the historical perspective for this section being incidental. Any historical treatment is under the heading 'History of Book Printing.' The northern hemisphere colonial experience in North America has recently had some coverage. In his 1979 study of the North American chromolithograph, Peter Marzio commented on sources, saying that "so little recent scholarship has dealt with American chromolithography that this survey was written chiefly from primary documents,"⁴⁶ serving as a pointer for this study. A more recent book, *Stamped with a National Character: Nineteenth Century American Color Plate Books: An Exhibition* (1999) by William Reese, bears on one aspect of the topic: that of nineteenth century American book illustration. Although Reese's work contains an informative overview in the introduction, there is no bibliography.

Methodology Appropriate to the Research Topic

For an academic historical treatment of the development of colour printing in New Zealand, it is necessary to use a methodology which will take proper account of the derivative nature of printing in New Zealand as an offshoot of British printing initially, the paucity of scholarly studies of such relationships with regard to colour printing, and the exploratory nature of this study. The book historian Wallace Kirsop points out that "no one mode of presentation stands out as inevitable" for frontier areas in which solid study is still to be done.⁴⁷

For a topic in which research into the past developments, relationships and patterns is central, an *Historical* methodology provides the best fit. The aim in the first stage of the historical methodology is to array available sources, and to gather data. In the field of New

Zealand colour printing, in which the secondary sources are thin and the primary sources fragmented and scattered through several subject areas, this has been a large and ongoing task. Procedure to collect historical evidence in a systematic way for historical subjects has been set out by Shafer (1980).⁴⁸ In essence, this involves bibliographic search, location of items, description, control and analysis to categorise the evidence in a way which will allow the answers to the research questions to emerge. Appropriate aids and guides are used to help isolate and locate the literature, both primary and secondary, and other archival materials that are relevant to the research topic.

Mauch and Birch (1998) have defined the nature of *Historical Methodology* as one in which “individuals or activities are studied to reconstruct the past accurately and without bias in order to ascertain, document and interpret their influences or to check the tenability of an hypothesis.”⁴⁹ They state that the posing of and responding to research questions may be seen as a similar activity to testing a hypothesis. Shafer has said that for an historical methodology “there are three well-agreed-upon elements” which consist of first ascertaining the categories of evidence, next collecting the evidence (using systematic bibliographic method) which he warns “is not child’s play,” and finally the communication of findings.⁵⁰ At the source identification stage, historical critique (both external and internal) occurs, and historical analysis may be done both at the data collection stage, as well as at a following stage. For this study, methodology of an historical nature has been appropriate to the choice of relevant sources, as well as for the collection, analysis and the reporting of data.

David Madsen (1992) says that the non-experimental approach must be used by the historian because “she cannot re-create the personalities, events, and conditions that combined to produce historical record.” Rather, the objective of the historian’s methodology must be “to determine the relationships between persons and events by studying documents, books, reports, films and a host of other sources.”⁵¹ In his paper ‘Extended Evidence: D.F. McKenzie and the Forms of Bibliographical Knowledge’ (2001), Michael Suarez said of book history that it is an inexact science, in which part of the task of the scholar is to recover the nature of a past that resulted from composite processes of creation in a community of artisans, for which a deductive approach and the posing of relevant questions is an appropriate approach.⁵² Historical research analysis and reporting deduces cause from effect, in that it explains retrospectively, and is most often qualitative in nature. Mauch and Birch have characterised qualitative research as typically using deductive methods, because such research “reaches conclusions by reasoning or inferences

from general principles to particulars.” Research of this nature seeks to provide “full and accurate descriptions of phenomena in all their complexity,” and aims to “reveal or establish cause and effect relationships in or among experiences or occurrences.”⁵³

For this study a non-experimental, qualitative approach has been indicated in order to document and analyse complex data which has sprung from the interaction of many elements, including the people involved in colour printing, the processes and the products, all within the socio-economic setting of the marketplace of print. In addition, a qualitative approach has been appropriate for such exploratory research which inherently seeks to increase understanding in a topic which has had little specific prior treatment, and where it has been necessary to begin to establish even general basic chronology and narrative. Mauch and Birch define *Exploratory Research* as being an investigation into “new or relatively unknown territory for the purpose of searching out or much more closely scrutinizing objects or phenomena, mostly to lead to a better understanding of them.”⁵⁴

This study has sought to interpret the data by responding to the research questions in an historical manner. Lyn Gorman says that “the historian may have used a wide range of relevant sources and come up with a satisfying interpretation which responds to the initial problem,”⁵⁵ but the challenge is still to convey the results in an integrated manner. For a qualitative study, Ronald Chenail (1995) advocates that the methodology be kept simple, “because in qualitative research the complexity is in the data. If you get too complex in your method, the reaction between a complex method and complex data will be disastrous.”⁵⁶ Within an historical methodology, thematic analysis facilitates the ordering of complex data and paves the way for the later synthesis of findings.

For print culture studies, Wallace Kirsop (1995) suggests taking the lead from general historians and employing a comparative approach as a useful tool to “profitably look at the parallel developments of other colonies of recent European settlement.”⁵⁷ Since the present study is concerned with historical printing development that has its roots in one country and which has then been transplanted over time to various colonial settings, including America, (in the 17th century), Australia, (in the late 18th century) and New Zealand (in the mid-19th century), a comparative approach is indicated, especially with the country of origin, but also where relationships, especially to Australia, are encountered in the course of the New Zealand research. In ‘Printing in Colonial New Zealand: An Insular History?’ (2000), Roderick Cave advocates that the history of the book in New Zealand should try to take account of cultural linkages, rather than treating the subject in an insular fashion: “A history

of the book in New Zealand, I maintain, should *not* be an insular history, but treated as part of the continent, the Main.”⁵⁸ Shafer advocates a comparative approach to bring out patterns and to assist generalisation in terms of probabilities.⁵⁹ The comparative can be used as an analytical device to bring out similarities and differences for the aspects of colour printing under study in separate geographical settings, the British background parent culture constituting the initial context from which some colonial developments were derived, including the development of printing within the colonies of both Australia and New Zealand.

Application of Chosen Methodology to the Study Phases

Overview

Using the historical methodology, first accessible sources relating to colour printing in Britain and Europe were identified and analysed to construct a conceptual framework within which data concerning the New Zealand development could be categorised and analysed comparatively to ascertain similarities and differences.

As well, search and then analysis of sources relating to the British experience was essential to provide background information and data on technologies, equipment, processes, skills, products and genre that were necessary for the researcher combing through the widely scattered secondary sources, and the much larger and more widely dispersed primary materials relating to colour printing in New Zealand, to identify what data was relevant. For example, very useful material was located in the trade journals. A knowledge of trade terminology and history was built as a basis for the glossary that has been compiled and included as Appendix 4.

Because there has not yet been any study directly on the history of colour printing in New Zealand, the approach for this study has had to be innovative in order not only to build a suitable conceptual framework, but also to take account of the fact that sifting of material from a wide range of sources, both primary and secondary, was necessary. It was therefore appropriate for historical research for this study to be carried out in two phases.

Phase 1. European and British Colour Printing

The general background history of printed colour especially as it appeared in Britain in book illustration, prints, maps and ephemeral items was initially studied, as well as history of the printing processes, machinery and essential tools particular to colour printing. A research bibliography was then gradually built, from which colour printing history information was extracted and organized for preliminary analysis. (See Literature Review.)

A broad structure or conceptual framework was created around the several themes that emerged from the literature and which meshed with the Adams and Barker model for the study of 'The Book.' The framework acted as an organising principle for the research as it moved on to the analysis of the literature relating to New Zealand, and also around which the later synthesis of findings were formed.

Significant Themes Identified:

Chronology and Background

This theme was necessary to establish timelines against which the development in other places could be compared, and to which other themes could be linked, and to establish relevant cultural contexts of the nineteenth and early twentieth centuries.

Processes and Equipment

The landmarks in the evolution of colour printing concerning processes and machinery were ascertained where possible in order to answer questions grouped around what was technically possible and how. The answers assisted in the later evaluation of New Zealand similarities and differences.

Influential People

The biographical theme was an important one for this study as it helped to bring out some of the personal qualities and specific skills that were important for successful colour printing in each of its developmental phases, including the necessity for the colour printer to possess excellent colour vision. This approach allowed answers to questions surrounding the colour printers and their characteristics, as well as the role of others, for instance, the artists, engravers, and pressmen, to be attempted.

Genres and Markets

This theme helped to identify what sectors of the market desired colour printing in successive periods, so that some of the market drivers were able to be discerned. To assist orderly examination of the literature, and allow answers to questions to be approached that are broadly grouped around – What were the drivers of the colour printing market? – the printed products in which colour printing has appeared were analysed under the following broad genre categories:

- ***Books, Periodicals, Newspapers*** (included plates in books and illustration in periodicals and newspapers).
- ***Maps*** (included plans, maps and atlases).
- ***Prints*** (both reproductions of original art-works and original prints).
- ***Ephemera*** (from job printing production).

Standards

This theme included the concept of standards as applied to colour printing which enable quality control, and history of standards as found working in the trade.

Phase 2: New Zealand Colour Printing

This was the major part of the work, and entailed a wide search effort since there had not been any substantial scholarly work specifically on the close topic to date. The two main bodies of evidence located and searched were the primary sources, consisting of the primary artifacts themselves, as well as primary literature, and a wide variety of secondary sources, as indicated in the literature review. Unfortunately, due to past events such as fires, few records from colonial colour printing firms were found to have survived that were also beneficial to this particular study. All sources were approached using an historical methodology.

Identification of Sources and Materials

Firstly the appropriate tertiary sources indexes and guides were used to provide the relevant array of primary and secondary materials and to locate references to New Zealand colour printing which were then analysed according to the conceptual framework developed.

Secondary Sources: Literature

Titles that have covered the field of the general printing history in New Zealand were the point of departure for analysis and location of information that were relevant to the topic, the one major title in this category being R.A. McKay's centennial history of printing (1940). Relevant passing references in any literature where there was at least some mention of New Zealand colour printing provided leads to other, often primary, sources. Thus data was collected from a range of literature, not only from the general printing literature, but also from the biographical sources and works with an historical approach from other fields such as the natural sciences, art and cultural history, as well as cartography; that is, fields in which colour printing was found to have played a significant part.

Sources which contained at least passing references to relevant elements were found in books and periodical articles within general printing history (and in overlapping publishing history); within general studies of related topics such as the histories of printing processes, newspaper printing, the illustration of books, and of jobbing printing; within regional printing histories; within specific studies on related topics, such as those on art processes, lithography, map printing, in histories of children's literature, of botanical and zoological illustration, philatelic and banknote history. Some works in fields such as historical geography, cultural and social history were also found relevant. *Book & Print in New*

Zealand: A Guide to Print Culture in Aotearoa (1997), the most specific guide to existing New Zealand print culture literature, was a key reference, and assisted in the identification of literature, including primary source materials and artifacts that were relevant to the proposed area of research, especially for print products that can be grouped as reading matter and ephemera, although taking into account the fact that in this guide the topic of colour printing was not specifically addressed. However, the overarching field of 'Printing and Production' has been covered in one section of this book, within which source literature in areas that are integrally related to colour printing such as graphic reproduction techniques have been indicated, as well as general sources such as those found in historical collections, museums, historical exhibition catalogues and reports. Expert knowledge from the *Guide* was used to determine further tertiary sources, as well as some primary sources.

Some secondary sources included bibliographies and lists of references which were used to help locate further arrays of secondary literature and to also lead into primary sources. Because the data for this subject is widely scattered, it was often necessary to unearth it from the literature by reference to the contents page and the index where provided, as well as sometimes to the footnotes in relevant chapters. Periodical articles with a historical perspective of relevance were sought in a range of serials that have appeared over the years, and systematic searches of tools such as *Index to the New Zealand Periodicals* and the Tapuhi database were useful, the latter particularly so.

For initial identification of the people who were engaged in the colour printing trade in New Zealand, the general printing literature was a starting point.⁶⁰ With regard to printers and others active in colour printing such as engravers and lithographers, the topic was then pursued by consulting biographical sources, particularly the relevant volumes of *The Dictionary of New Zealand Biography* (1990-), as well as the Turnbull Library's 'Tapuhi' database.

Primary Materials

Primary Literature Sources

Primary sources consulted consisted of literature from the times, most importantly the printers' periodicals such as the *Penrose Annual* and the New Zealand published *Typo*. A useful source for New Zealand colour printers present by the end of the nineteenth century was the *The Cyclopaedia of New Zealand: Industrial, Descriptive, Historical, Biographical Facts, Figures, Illustrations, 1897-1908*. Supplementary information was gleaned from sources such as the newspapers, directories and guides produced during the period.

Archival Records

The New Zealand colour printing firm A.D. Willis of Wanganui was active in the nineteenth century in the lower North Island region and was chosen for special attention as an illustrative case study, although emphasis was also laid on other colour printers of this region. As noted, the lower North Island, which is Wellington's 'home' region was chosen for special study partly because relevant archival records were more accessible. Colour printers from the period included several in Wellington, of whom the Government Printer was one. Although many of the printers' records from these firms have not been preserved, the material retained at the Whanganui Regional Museum, although not substantial, contributed to the case study of colour printing at the firm A.D. Willis, while in Wellington the Head Office of the National Archives held records, for instance, from the Government Printing Office, some of which were of limited relevance to the study.⁶¹

Printed Artifacts

A representative range of surviving printer's products across most genres in which colour has featured were examined in order to collect and analyse data both thematically and illustratively. Appropriate tertiary guides and indexes were first used to provide locations of items belonging to the variety of genre categories sought. These items included colour-printed reading matter, such as colour-plate books, serials, annuals and the special numbers of the weekly newspapers, coloured prints and maps, as well as a variety of the ephemeral items, such as the programmes, catalogues, labels, letterheads, cards of various kinds, and advertising material, for example posters, that all resulted from New Zealand job printing activities.

Uneven Source Materials

To allow for bias introduced by a divergence of approach, and also because of the fact that some relevant material came from sources of diverse standards, often in the nature of passing references rather than being the direct focus of the work, where possible more than one source was consulted as a cross-check on data of uncertain reliability.

DATA ANALYSIS

Data Collection: Application of Framework

Themes

At the collection stage, data was analysed around the themes that emerged in Phase 1 of the study concerning British colour printing. This gave the order and structure necessary for analysis of the sources and materials used in Phase 2, the New Zealand research.

Chronology

Data collected under this theme provided an outline chronology of significant events in New Zealand colour printing history, and allowed a provisional overview of the New Zealand experience to be formed which was augmented by thematic and case study. Comparisons were then made with the British development to identify differences, such as speed of uptake of the main colour printing processes, time-lags present in the New Zealand situation and significant variations in colour printing practice.

Colour Printers and Other Influential People

Subdivision of this theme was found useful in studying such topics as the skills and training of those involved in the trade: the printers and others such as the engravers, lithographers, artists, and pressmen, and in organising data under such subtopics as biography, career paths, and the nature of the printing businesses.

Processes and Equipment

Data collected and analysed under these topics enabled comparisons to be made between the colonial and the parent culture technology, and facilitated the identification of patterns, similarities and differences.

Genres and Markets

Primary materials were examined under genre categories, with subdivision into such topics as local versus overseas markets relating to both buyers (including private and public institutional influences) and providers in the market (printers). Discussion surrounding private buyer influences took into account such influences as general cultural, social, emotional, intellectual and economic influences, while discussion surrounding public institutional buyers has included topics such as practical business needs and official politics. Factors seen as trade influences were those such as the personal preferences, skills and abilities of printers and their wish to participate in colour printing technical innovation, as expressed, for example, in coloured title page decoration, posters, processes used for illustration, and the genre they produced. Other factors were such considerations as artistic and educational aspirations, financial resources and advertising needs.

Standards

Data collected related to processes used in New Zealand for plate, block and letterpress colour printing. The study of standards has included an assessment of the place of colour vision as an essential personal characteristic for those working to achieve quality colour printing.

Figure 5: A Conceptual Model: New Zealand Colour Printing Themes.
Adapted and Expanded from the "Manufacture (or Production)" Phase of the Adams and Barker Book Cycle Model (1993).

Conceptual Framework (See figure 5.)

The *conceptual framework* has been expressed as as a whole in the model ‘New Zealand Colour Printing Themes’ which has been adapted and expanded from the ‘Manufacture/Production’ phase of the Adams and Barker book cycle model (1993). This model has acted as an organising principle around which the relationships between the themes and subtopics have been studied.

Sampling

Since this historical study is qualitative in nature, *Judgemental or Purposive Sampling* which is non-random in type, has been appropriate. Kumar (1996) states that “this type of sampling is extremely useful when you want to construct a historical reality, describe a phenomenon or develop something about which only a little is known.”⁶² The essence of this approach is that the researcher goes to the place or person known to provide the best information to achieve the objectives of the study. Selection is made from the pool of materials available.

Preliminary Rank Order of Repositories of Primary Sources

Before data collection began, archival sources were assessed and ranked according to their probable importance to the research project, in order to determine the most efficient and effective data collection procedure for accessing and studying relevant artifacts. This identification and selection of archival resources was the first phase of positive sampling.

Archival Sources by Category and Rank Order by Importance to Project						
Rank	Institution	Records	Reading Matter – Includes Trade Journals	Prints	Maps & Plans	Ephemera
1	National Library/ Alexander Turnbull Library	X	X	X	X	X
2	Victoria University		X		X	
3	National Archives Head Office	X			X	
4	Hocken Library	X			X	X
5	Canterbury Museum				X	
6	Canterbury University Library		X			
7	Dunedin Public Library		X			
8	Whanganui Regional Museum	X				X
9	Otago Settlers Museum					X
10	Te Papa	X				

Figure 6

Figure 6 reflects the institutions used, and the categories accessed in each (not all categories held), roughly in order of use and importance to the research. Some institutions were visited

for a particular purpose, such as the Whanganui Regional Museum, which was of particular importance for the A.D. Willis Papers held. The rank order assigned was closely followed and was found to have been largely an accurate guide.

Conclusion

Evidence from the examination of print products (the artifacts) was of particular importance for this project, especially in view of the fact that many colour printers' records have been lost or destroyed. However, evidence gathered from literature, both primary and secondary, was able to be combined with the evidence from the artifacts and from other relevant documentary sources that have been preserved and that were accessible.

Data Analysis and Findings

Information from both primary and secondary materials was analysed and recorded according to the developed themes. (See also Literature Review.) The historical methodology was used to analyse and interpret the data collected under the appropriate themes and to report the findings as far as possible as a synthetic unity, as described by William Dray (1989).⁶³ Responses have been made to the research questions in chapters three to twelve that follow, to show changes over time and to bring out the complex relationships and dynamics of those changes as colour printing developed in New Zealand, particularly with regard to the aspects of the technology, the printers and other influential people, the colour-printed products and the markets for those products in the period under study. Special reference to the lower North Island colour printers, particularly the firm of A.D. Willis, and to the genre study of the special numbers of the New Zealand weeklies has been made.

Divisions of the Research Topic

After initial establishment of chronology and background, research topic themes fell into four main divisions which applied to the successive historical colour printing eras, as well as to the various geographical locations under inquiry. The divisions of the research topic itself are indicative of the broad structure under which the research questions have been grouped and under which all appropriate other themes were subdivided, as seen in the model. (See Research Topic Section: Figure 5.)

CONCLUSION

For this study, the need was first for a synthesis of data from British colour printing history secondary literature sources to facilitate an exploratory study of New Zealand colour printing history from the perspective of the British culture from which the New Zealand culture was initially directly derived. Although there has been no complete and definitive

scholarly history of colour printing yet written, even for the British history, portions of the subject have been covered in diverse ways, so that information for phase 1 of the study was synthesised from a great variety of sources, and has been placed for reference in volume II: Appendix 2 A-D.

Examination of the New Zealand literature of print culture relevant to this research topic revealed that for the history of colour printing in New Zealand there has been no specific study that has yet specifically addressed the topic. In the area of the history of print production, the approach was initially to the general print culture literature, and then to a wide variety of other sources, both primary and secondary. In the general printing history and in the related subject literature, reference to colour printing was sparse, requiring information on the New Zealand colour printing trade to be collected from passing references. Even to construct a cogent time-line of significant events for the colour printing trade (volume II: Appendix 1 A-C) required careful searching of the literature and cross-checking of detail in sources of varying quality. A preliminary part of the work was concerned with the development of an appropriate conceptual framework to facilitate the analysis of data for the aspects under study, the response to the research questions, and the reporting of the findings.

Aspects of the New Zealand history of colour printing that have been studied have been structured according to themes that have emerged from the literature relating to the history of the parent British colour printing culture whence the New Zealand culture sprang. The topic of colour vision, an attribute that has always been the essential tool of the colour printer, and its relationship to colour printing history has been explored as one aspect. After thematic data collection and analysis, responses to the research questions were made: these follow each thematic section of the study report. Rather than attempting to provide a definitive colour printing history, this thesis is an interpretive thematic study that has aimed to increase understanding in one area of print culture history, the area of printing history, by exploring some aspects of the development of one particular side, that of colour printing in colonial New Zealand.

¹ Scott Heller, 'Visual Images Replace Text as Focal Point for Many Scholars', in *The Chronicle of Higher Education*, July 19, 1996: A8, A9, and A15.

² James E. Mauch and Jack W. Birch, *Guide to the Successful Thesis and Dissertation: A Handbook for Students and Faculty*, 4th ed., rev. and exp. (Basel: Marcel Dekker, 1998), 98.

³ John Tosh, *The Pursuit of History: Aims, Methods, and New Directions in the Study of Modern History*, 3rd ed. (New York: Longman, 2000), preface to the third edition, viii.

- ⁴ Lyn Gorman, 'Historical Investigation in Information Organizations', chap. 9 in *Quantitative Research for the Information Professional*, ed. Gary Gorman (London: Library Association Publishing, 1997), 165.
- ⁵ Robert William Fogel and G.R. Elton, *Which Road to the Past: Two Views of History* (New Haven: Yale University Press, c1983), 14.
- ⁶ Tosh, *The Pursuit of History*, 30.
- ⁷ Ibid., 92.
- ⁸ Miles Fairburn, *Social History: Problems, Strategies and Methods* (Basingstoke: Macmillan, 1999), 11.
- ⁹ Tosh, *The Pursuit of History*, 93.
- ¹⁰ Gorman, 'Historical Investigation in Information Organizations', 171.
- ¹¹ Dennis A. Trinkle, *Writing, Teaching and Researching History in the Electronic Age: Historians and Computers* (Armonk, N.Y.: M.E. Sharpe, c1998), 204.
- ¹² Tosh, *The Pursuit of History*, 132, 134.
- ¹³ David Madsen, *Successful Dissertations and Theses: A Guide to Graduate Student Research from Proposal to Completion*, 2nd ed. (San Francisco: Jossey-Bass, 1992), 44.
- ¹⁴ Fogel and Elton, *Which Road to the Past*, 16.
- ¹⁵ Robert Jones Shafer, *A Guide to Historical Method*, 3rd ed. (Chicago: The Dorsey Press, 1980), 34.
- ¹⁶ Gorman, 'Historical Investigation in Information Organizations', 167.
- ¹⁷ Wilfrid Prest, 'The Future of the Past', in *Lumen: A Special Issue*, May 1999: 31.
- ¹⁸ Miles Fairburn, *Social History*, 310: "Hermeneutics. In the social sciences, a form of investigation of actions and practices that endeavours to interpret what these mean to the actors."
- ¹⁹ Ibid., 232.
- ²⁰ Ibid., 233.
- ²¹ Ibid.
- ²² Tosh, *The Pursuit of History*, 212.
- ²³ John Feather, 'New Directions in Book History', in *BSANZ Bulletin*, 12 no.2 (1988): 49-61.
- ²⁴ Philip Gaskell, *A New Introduction to Bibliography* (New York: Oxford University Press, 1972), 137.
- ²⁵ D.F. McKenzie, 'Printers of the Mind: Some Notes on Bibliographical Theories and Printing-house Practices', in *Studies in Bibliography*, 22 (1969), 6.
- ²⁶ Michael Winship, 'Publishing in America: Needs and Opportunities for Research', in *Needs and Opportunities in the History of the Book: America, 1639-1876*, ed. David D. Hall and John B. Hench (Worcester, MA: American Antiquarian Society, 1987), 86.
- ²⁷ Thomas R. Adams and Nicolas Barker, 'A New Model for the Study of the Book', in *A Potencie of Life: Books in Society: The Clark Lectures 1986-1987*, ed. by Nicolas Barker (London: The British Library, 1993), 13.
- ²⁸ D.F. McKenzie, 'History of the Book' in *The Book Encompassed. Studies in Twentieth Century Bibliography*, ed. Peter Davison (Cambridge: Cambridge University Press, 1992), 298.
- ²⁹ Ibid., 300.
- ³⁰ Ibid., 297.
- ³¹ David Hall is general editor for the multi-volume collaborative *History of the Book in America*. The points were made in his lecture, later published, 'On Native Ground: from History of Printing to the History of the Book', *Proceedings of the American Antiquarian Society*, 93 (1983): 313-336.
- ³² Winship, 'The Art Preservative: From the History of the Book Back to Printing History', in *Printing History* 17 no.1 (1995): 15.
- ³³ Ibid.
- ³⁴ G. Thomas Tanselle, 'Printing History and Other History', in *Studies in Bibliography*, 48 (1995): 289.
- ³⁵ Keith Maslen, 'Towards a History of the Book in New Zealand', in *BSANZ*, 17 no.4 (1993): 201.
- ³⁶ John Feather, 'New Directions in Book History', 54.
- ³⁷ Wallace Kirsop, 'Booksellers and their Customers: Some Reflections on Recent Research', in *Book History*, ed. by Ezra Greenspan and Jonathon Rose (Pennsylvania: The Pennsylvania State University Press, 1998.), vol. 1, 284.
- ³⁸ Martyn Lyons and John Arnold, *A History of the Book in Australia, 1891-1945: A National Culture in a Colonised Market* (St. Lucia, Qld.: University of Queensland Press, 2001).
- ³⁹ Kirsop, 'Booksellers and their Customers', 302.
- ⁴⁰ David McKitterick, 'Perspectives in Two Hemispheres: Approaches to the History of the Book in New Zealand' in *BSANZ Bulletin*, 20 no.2 (1996): 79.
- ⁴¹ Ibid., 89.
- ⁴² Feather, 'New Directions in Book History', 59-60.
- ⁴³ Winship, 'The Art Preservative', 17.

⁴⁴ Ibid., 22.

⁴⁵ 'Announcement: A History of the Book in Australia', in *BSANZ*, 17 no.4 (1993): 204.

⁴⁶ Peter C. Marzio, *The Democratic Art: Pictures for a 19th-Century America: Chromolithography 1840-1900* (Boston: D.R. Godine, 1979), 265.

⁴⁷ Wallace Kirsop, 'Books for Colonial Readers – the Nineteenth-century Australian Experience', *BSANZ Occasional Publication*, no.5 (Melbourne: Monash University, 1995), 2.

⁴⁸ Robert Jones Shafer, *A Guide to Historical Method*, 3rd ed. (Chicago: The Dorsey Press, 1980), 49.

⁴⁹ Mauch and Birch, *Guide to the Successful Thesis and Dissertation*, 119.

⁵⁰ Shafer, *A Guide to Historical Method*, 40.

⁵¹ Madsen, *Successful Dissertations and Theses*, 44.

⁵² Michael Suarez, 'Extended Evidence: D.F. McKenzie and the Forms of Bibliographical Knowledge', conference paper, 'Remembering Don McKenzie International Conference', 12-14 July 2001, National Library of New Zealand.

⁵³ Mauch and Birch, *Guide to the Successful Thesis and Dissertation*, 18.

⁵⁴ Ibid., 119.

⁵⁵ Gorman, 'Historical Investigation in Information Organizations', 171.

⁵⁶ Ronald J. Chenail, 'Presenting Qualitative Data', *The Qualitative Report*: 2 no.3 (1995): 7. URL: <http://www.nova.edu/ssss/QR/QR2-3/presenting.html>, downloaded 17/11/99.

⁵⁷ Kirsop, 'Books for Colonial Readers', 2.

⁵⁸ Roderick Cave, 'Printing in Colonial New Zealand: An Insular History', chap. 15 in P.A. Griffith, Peter H. Hughes and Alan Loney, eds., *A Book in the Hand: Essays on the History of the Book in New Zealand* (Auckland: Auckland University Press, 2000), 235-144.

⁵⁹ Shafer, *A Guide to Historical Method*, 24.

⁶⁰ P.A. Griffith, Ross Harvey and Keith Maslen, eds. *Book & Print in New Zealand: A Guide to Print Culture in Aotearoa* (Wellington: Victoria University Press, 1997), 69.

⁶¹ In the absence of complete business records, research questions must be devised in a way that enables data collected from the available archival materials to be tested for at least interim significance and value, enabling tentative responses to be made. Especially for an explorative study such as this, it is to be expected that such findings are open to revision or modification if other evidence comes to attention.

⁶² Ranjit Kumar, *Research Methodology: A Step-by-Step Guide for Beginners* (South Melbourne: Addison Wesley Longman Australia, 1996), 162.

⁶³ William H. Dray, 'On the Nature and Role of Narrative in History', in *On History and Philosophers of History* (Leiden; New York: Brill, 1989), 111-130.

SECTION II

Colour Printing Reaches New Zealand

CHAPTER 3

NEW ZEALAND IN AN AUSTRALASIAN SETTING

Research Questions:

1. *What were some of the relevant background cultural factors operating in Britain and in New Zealand during the period and how were they impinging on colour printing developments.*

2. *Within an Australasian context, how did the early development of colour printing to the time of the establishment of chromolithography in New Zealand compare with developments occurring in the British culture?*

First Northern Hemisphere Print Cultural Contact with Australasia

The Visual Record: The Earliest Images and Maps of the Antipodes

Print cultures in Europe, developed as a means for wider dissemination of print materials than had been possible before the time of Gutenberg, first enabled multiple copies of especially texts to be more efficiently produced, in turn allowing the individual originator to communicate with a much more extensive audience. The pressure for the development of colour printing was a part of the wish for a means of the greater dissemination of images, but because the associated technical difficulties hindered the development of economic printing processes, continued as essentially an art process until the photomechanical revolution of the nineteenth century.

The desire to convey to the homeland the visual impression of faraway lands had long been present as part of what was carried back from sea voyages. The efficacy of the image as a significant device for communication had been long recognised if it could be economically produced because it was capable of wide distribution, enabling it to speak to a wide variety of viewers.¹ Original drawings and paintings were the basis of the later printed images that through their greater availability and affordability began to fulfil this function. The early Dutch voyagers had brought back first-hand impressions of the great south land, and by the second half of the seventeenth century many of these images were housed in Amsterdam in the collection of the burgomaster Nicholaas Witsen.² One early profile of a portion of the Western Australian coastline in existence from 1658 was drawn by Johann Nessel in watercolour, pen and pencil during a search for survivors from the wreck of the Dutch ship *De Gulden Draeck*.³ Witsen's curiosity concerning the mysteries of New Holland led to a later voyage carrying two artists in the 1690s. This resulted in a series of eighteen

watercolours, the fifteen *Coastal Views of Western Australia* by Victor Victorszoon among them constituting “the earliest comprehensive views of the western Australian shoreline.”⁴

Although these originals were in fact lost and did not come to light until 1970 in the Prins Hendrik Maritiem Museum in Rotterdam, by 1692 Witsen had published part of this pictorial record as illustrations, although altered to conform more to his taste, for his *Noord en Oost Tartarye* (second edition 1705). This process of altering the original drawings during the engraving process was not uncommon at the time and indeed often continued during subsequent reproduction as well. It was to be some of Witsen’s idealised images that were later carried with James Cook when he set sail on the *Endeavour*.⁵ Also as far back as the seventeenth century, in Abel Tasman’s journal, early visual impressions of the New Zealand natives were recorded by Isaac Gilsemans in 1642, and these are said by William Eisler to be the only first-hand images of these people executed prior to the eighteenth century that survive.⁶

Since the sixteenth century, in response to the idea of the Terra Incognita Secundum Ptolemeum, or the Unknown Land according to Ptolemy, maps had depicted the existence of a great uninhabited southern landmass. In fact the idea of a southern continent to balance the world had existed since ancient times, and had been shown on the illustrative maps in a work, the *Dream of Scipio*, a commentary on a fifth century Roman treatise, that had lain hidden throughout medieval times.⁷ For map printing, the advent of copperplate engraving, also in the sixteenth century, had enabled the improvement of their appearance, and from that time onwards had paved the way for an upsurge in the publication of wall-maps and atlases. Many of these were handsomely hand-coloured: the means for the economical addition of colour from the press was yet a long way off. In 1569-72, Christopher Plantin’s Polyglot bible had appeared with a map of the world showing the fabled southern continent. Gerhard Mercator’s 1538 world map had also incorporated this southern land which had been named Terra Australis by Oronce Fine in 1531. From this map others that became widely known were derived, including a map published by Gerhard’s son that was later reissued in the Mercator Atlas of 1595. Another derivation was the famous *Typus Orbis Terrarum* of 1570, published by the Antwerp cartographer/printer, Abraham Ortelius, in which the mystical southern continent appears prominently, partly because the mercator projection exaggerates the area, but also because it is shown in colour, a pink wash added by hand.⁸ It is believed that from this particular map sprang a fascination for the “not yet known” southern land, firing especially the English imagination with “dreams of an English Empire in the South Sea.”⁹

During the first half of the seventeenth century, Dutch navigators added much to general knowledge of the southern continent, as they opened up routes for subsequent voyagers, although in the end their first encounters with the land that was later to become known as Australia led to disappointment. The lack of commercial opportunity in a seemingly empty continent caused them to turn their interests elsewhere. In spite of attempts by the Dutch to keep their discoveries secret, in 1625 Hondius published a map in which the pre-Tasman Dutch contributions, particularly those of Carstensz, finally began to replace the shadowy Terra Australis. After the 1642-43 and 1644 voyages of Tasman, when Anthonie Van Diemen's Landt was first discovered, (on December 13, 1642), and subsequently the west coast of the South Island of New Zealand, both Australia and New Zealand began to appear on maps as separate entities. At this time Amsterdam was the world centre for cartography. By the late seventeenth century the decorative aspect for maps had reached a zenith, being especially evident in the decorative borders and brilliant colouring that was often added. The first depiction of Australia in an atlas is considered to be in Jan Cloppenburg's edition of *Mercator Atlas Minor*, that had been first published in 1631. A later edition published in 1673 and 1676 by the heirs of the mapmaker Jansson also included Tasman's discoveries of 1642,¹⁰ first Anthonie Van Diemen's Landt and then the west coast of the South Island of New Zealand. Blaeu made new charts and revised old ones by rehammering the copper plates to include the results of Tasman's voyages, and is credited with producing the earliest printed chart with the name Nova Hollandia to represent Australia, Anthonie Van Diemen's Landt for Tasmania, and Zellandia Nova to represent New Zealand. After this period of updating, maps remained much the same until the time of Cook's voyages.¹¹

By the beginning of the eighteenth century France also had a well-established cartographic tradition which catered for the printing of maps and charts associated with the French voyagers of the time. In their quest for new trading routes and destinations, as well as new opportunities for colonisation, navigators from several European countries set out on exploratory voyages. By the middle of the eighteenth century there was much rivalry between the British and the French for expansion, and it was during this period, in 1768, that the British Royal Society sent Cook to observe the transit of Venus at Tahiti, and afterwards to further explore the Southern lands. Thus it was that in 1769-70 Cook successfully circumnavigated New Zealand and also in 1770 first discovered the more hospitable and economically promising eastern coast of Australia, a region that had hitherto eluded the Dutch.

Cook's Voyages: Pre-19th Century Images of NZ

By 1773 engravings from the South Seas had appeared in a London publication, and further early images of the South Pacific appeared in London in 1800 in the form of a published volume of engravings that was printed for J. Debrett in London with the title *An Account of a Voyage in Search of La Perouse*, by Jacques Julien Houton de Labillardière.¹² By the time Cook was exploring New Zealand and Australian waters, the visual arts programmes carried out on voyages had become significant ones, because this period coincided with the changing perceptions in western art from a traditional focus on classical naturalism to one of empirical naturalism. Between 1768 and 1780, Cook collected as many as three thousand drawings mostly portraying new natural phenomena, mainly of Pacific origin, and not before seen by Europeans. These drawings were purposefully conveying, in a scientific sense, the visual appearance of such things as new plants, fish, animals, land coasts and foreign people, and were eagerly awaited by home-based scientists and scientific organisations such as the Royal Society. This, then, was the time when the informational value of art came to be recognised and began to be used in the service of science.

The botanist on Cook's exploratory voyages to the Pacific, Joseph Banks, shared this view of the value of scientific knowledge, appreciating "the significance of the application of science to technology for the future of England." Cook had also been inspired to pursue such a visual arts programme by another voyager, Anson, who had been one of the first to bring back a visual record of an expedition. A copy of the publication that had ensued from Anson's voyage and which became a popular travel book at the time was in Cook's possession: it was Cook's chaplain, Walter, who had been the editor of that volume.¹³ Part of the wish to convey images to a waiting audience at home was the fact that so much of the natural environment of both Australia and New Zealand had a totally new appearance. The landscape, vegetation, bird and animal life, the native peoples – all were different. Banks contributed to the cause by striving for a scientifically based visual account and set new standards that were embodied in the prolific portfolio of drawings he brought back from the voyages. Part of this embodiment was the recording of the colours of new species viewed, and was also often part of what was revealed to a waiting public in subsequent publications: the natural history books for which there was a growing demand.

One of Banks' staff on the first voyage was the Scottish artist Sydney Parkinson who made the first illustrations of New Zealand plants, many of which were indigenous, and thus unique in the biosphere. Parkinson's watercolours, painted with photographic accuracy, are still regarded by botanist Bruce Sampson (Literature Review: 31) as "among the best

illustrations ever made of New Zealand plants."¹⁴ Of the first comprehensive collection of coastal and lowland plants of northern New Zealand made by Banks and Solander on Cook's first voyage, Parkinson managed to illustrate nearly two-thirds of the 360 collected. Plant collections were subsequently made on the east coast of Australia, and out of a total of 925 illustrations from both New Zealand and Australia, Parkinson was able to complete only about a quarter before his untimely death on the return voyage.¹⁵ Banks had most completed in London. Although copperplate engravings were later prepared in England from Parkinson's watercolours and a publication was planned, it did not come to fruition at the time, and so these early depictions of the New Zealand and Australian flora were never widely seen. However, again in recent times, in 1985 they were published as a limited edition of one hundred, with each set selling for around \$NZ 130,000, one of which has been purchased by the Alexander Turnbull Library in Wellington. Produced by Alecto Historical editions in London, the *à la poupée* technique has been used as the reproductive method to render the colouring. The fact that this technique of colour printing allows only one print to be taken from each inking of the chromium plated copper plate partially explains the high cost, as inking was executed by hand. Another recent publication, the book entitled *Sydney Parkinson* (edited by D.J. Carr), jointly published in 1983 by Nova Pacifica in Wellington, Australian National University Press in Canberra and the British Museum (Natural History) in London also contains colour reproductions of Parkinson's work as illustration to an article by Dr E.J. Godley. The relative difficulty of achieving cost effective colour printing for mass circulation in the eighteenth century contributed to the fact that it has not been until recent times that some of the early pre-settlement images of both Australia and New Zealand have been brought to a wider appreciation.

On Cook's second voyage in the *Resolution* both the naturalist Johann Forster and his son George were included with those who embarked with Cook. After a long voyage, anchorage in New Zealand waters was finally made at Dusky Bay in 1773 when George made many images, in particular of zoological subjects, especially paintings of birds, some of which in more recent times have been reproduced in colour in Charles and Neil Begg's 1966 book, *Dusky Bay*. (Plate 4.) Of the thirty eight new species described by the Forsters from both Dusky Bay and Queen Charlotte Sounds, George Forster illustrated thirty-five.¹⁶ On a later voyage, Cook's third, the Forsters continued this work. Some of the published images containing Australian and New Zealand subject matter from late eighteenth century voyages have also been reproduced in colour in twentieth century publications, for instance in the Beggs' *James Cook and New Zealand* (Government Printer, 1970) and in Sampson's *Early*

New Zealand Botanical Art (1985), an example in the latter being plate 8 showing Forster's depiction of the New Zealand mistletoe. Other images originally produced by the artist William Hodges who was the official landscape and figure painter on Cook's second voyage, have been reproduced in the 1969 publication, *Captain Cook's Artists in the Pacific 1769-1779* by Murray-Oliver.¹⁷

Of this whole period of the creation of images from the early exploration of the Pacific, William Eisler has concluded:

The discontinuous image-making process was, in turn, paralleled by the course of the history of Pacific exploration. Each period, each national effort remained distinct; and whereas important exchanges and borrowings occurred continuously, there was no steady progress from darkness to enlightenment. Written and graphic records were lost, concealed, or radically transformed. Precise depictions of human and animal forms were employed to create new myths. It is this remarkable series of oscillations between diffusion and concealment, between the real and the imaginary, which constitutes the intriguing vision of Terra Australis.¹⁸

Early 19th Century Maps and Images of Australasia

The early charts and maps that resulted from the expeditions of the European navigators such as Tasman, Cook and d'Urville added much to that important category of graphic representation and these were continuously refined, updated and extended by subsequent navigators and explorers. As time went on, the coastlines of both Australia and New Zealand began to be recorded with increasing accuracy. After the settlement of Australia, more detailed coastal mapping took place, especially around Sydney, and also as a result of the voyages of Bass, Flinders and Baudin. Matthew Flinders' circumnavigation of Australia in 1803 served to prove that the eastern seaboard (New South Wales) and the western New Holland were indeed continuous; it was Flinders who first recommended the name "Australia" for the continent, and in 1820 this was adopted. In 1814, the account of Flinders' exploration *Voyage to Terra Australis* was published in London with an accompanying 'General Chart of Terra Australis 1798-9'. Engraved on copperplate by W. Nicol, the outline of the continent, printed in black, was at last delineated with a fairly accurate shape.¹⁹ For copper-plate engraved maps, printing in black and white was typical. Inspired by Cook, d'Urville led three early nineteenth century French scientific expeditions to New Zealand, setting sail in 1822, 1826, and 1837. This navigator carried artists who recorded many aspects of the country first hand, including the colours encountered, and was also responsible for improved map-making techniques. From the first voyage, a few uncoloured engravings of New Zealand plants were included in a two-volume botanical

Plate 4: Early paintings of New Zealand birds made by George Forster in 1773 in Dusky Bay on Cook's second voyage in the *Resolution*.

Reproduced in *Dusky Bay*, 2d rev. ed. by A.C. & N.C. Begg, ([Christchurch]: Whitcombe & Tombs, [1966]), foll. 160.

Held: Victoria University of Wellington Library.

The bellbird (*Anthornis melanura melanura*).

The New Zealand pigeon (*Hemiphaga novaeseelandiae*). Although mentioned by Crozet in 1772, this fine bird was first described by the Forsters in Dusky Sound.

48. In 1773 the Forsters described thirty-eight new species of New Zealand birds in Dusky Sound and sketched thirty-five of them. All the paintings reproduced on this and the following page are by George Forster. (By permission of the trustees, British Museum, Natural History.)

The brown creeper (*Finschia novaeseelandiae*). George Forster labelled the painting *Parus urostigma*, and from it Latham wrote a description of the 'New Zealand Titmouse'.

The red-fronted parakeet (*Cyanoramphus novaeseelandiae novaeseelandiae*). Both Sparrman and the Forsters collected this bird in Dusky Sound.

The female paradise duck (*Casarca variegata*).

section under the general authorship of Dumont d'Urville of the five-volume atlas of illustrations that were additional to an eight-volume publication. Entitled *Voyage Autour du Monde, Exécuté par ordre du Roi, Sur la Corvette de Sa Majesté, La Coquille, pendant les années 1822, 1823, 1824 et 1825...* this publication first appeared in France in 1822.²⁰ From d'Urville's next expeditions, the voyage in the *Astrolabe* between 1826 and 1829 and the final one, with d'Urville commanding the *Astrolabe* and Jacquinot the *Zélée*, numerous drawings were produced that were later converted to hand-coloured lithographs on the return to France. Especially from the second voyage, many illustrative plates showing New Zealand flora and fauna resulted, as during the discovery of French Pass, and the exploration of Tasman Bay and Cook Strait, many specimens were collected. Thus it can be said that the origins of lithography dealing with New Zealand subject matter can be traced back to these two early voyages.²¹

The Establishment of Australasian Print Cultures

Socio-economic Background and Emergent Antipodean Print Cultures, Especially in New Zealand

Remoteness

As pointed out by Carl Schorske and reiterated by Roger Chartier, within the cultural historical context, as well as the "vertical" relationships in time, the spatial/geographical "horizontal" is an important dimension to be considered by the historian²² and is particularly relevant to this study. After British colonisation of first Australia, and then New Zealand began, so also began the establishment of printing and print culture in the Antipodes. For all Australasian colonial printing, including colour printing, one of the dominant features from that time on, was the distance from the northern hemisphere centres of print culture. Especially in the nineteenth century, this geographical isolation was profound, with shipping contact being the only means of communication to ameliorate the situation of being cut off from the parent culture, and this affected all aspects of Antipodean colonial culture, whether economic, political, social or intellectual.

Political Geography: Australasian Colonial Print Culture and 'Britishness'

Although New Zealand had initially been of interest to other sea-faring nations such as the Dutch and then the French, the eventual colonisation was by the British, and, despite other influences, it was this that was to stamp its print culture also with a Britishness. It was natural that the settlers sought to establish a similar culture to what they already knew, within the limits found feasible within the constraints of the remoteness, the small population, and the new physical and social environment they were encountering. Part of this was the transportation of technological and cultural preferences existing at the time of emigration, so that early print culture was in part a transplant that reflected as far as possible

the stage reached by the parent culture. Geographers Guy Robinson, Robert Loughran and Paul Tranter have recently summed up the historical cultural geography of the Australasian colonial situation:

Despite being over 12000 km from the 'mother country', the United Kingdom (UK), [Australians and New Zealanders of European origin] were tied irrevocably by cultural and economic links that rendered them islands of the Northern hemisphere cast adrift in the vast seas of the southern ocean. During the nineteenth and twentieth centuries the view of the worldwas Eurocentric, often Anglo-centric, with a shared heritage that was reinforced on the sporting field and supported by economic and military alliances with the UK...²³

In these southern colonies, many contrasting factors were operating, not least the differing physical environments within which patterns of early settlement began to develop their own characteristics that were reflected in their cultures, so that they developed both similarities and differences. Unlike the parent culture, the population in both colonies was disparate, composed on the one hand of indigenous peoples, and on the other of the settler/immigrants, a factor which facilitated diversification in the developing cultural milieu, giving a greater possibility of the appearance of the unique, but the cultural incongruity was also to be a source of many of the conflicts that hindered economic development. To found such remote colonies, great quantities of goods were shipped in, not only to break in the land and build new homes, but also to re-create the commercial environment and town-life that had been left behind. The new shores had the attraction of affordable land and easily attained space in which to set up. However, the machines, tools, materials and countless items of manufactured paraphernalia that had evolved with the western culture over centuries and that were now part of nineteenth century daily existence all had to be imported. The settlers looked to 'Home' for most of these requirements, especially at first, and for a long time to come trade with Britain was a central part of the emerging economies. Much that was brought was considered necessary for the physical survival and well being of the settlers.

Especially for the printing business, all essential equipment and materials had to be imported, and in Australasia, especially in New Zealand, that was to be the case for a considerable time to come. Initially, there was no local ink, no paper-mill, no type foundry, and no press manufacturer. Neither were there close neighbours from which such goods could be easily obtained, although New Zealand did obtain some supplies from the eastern seaboard colonies of Australia where printing, in conjunction with settlement, had begun at an earlier time. For the most part, all requirements had to be brought from England and set up on an alien shore, often in the flimsiest of structures that were built to provide protection from an almost completely unknown environment. For example, soon after the establishment of a colony in South Australia, in a hut under an old gumtree, a press was set

up to produce a hundred copies of the 'Proclamation of the Colony' that had just been issued, on 28 December 1836, by Governor Hindmarsh.²⁴ At the jubilee of the first South Australian newspaper, the *South Australian Register*, established on the 10th June, 1887, the occasion was recalled in a history of the paper, and a portion that was reprinted in New Zealand's *Typo* gives some telling background: Mrs Thomas, wife of the original proprietor writes:

We built a rush hut a short distance from our tents for the better accomodation of our family; but they had not long occupied it before everything was suddenly ordered to be cleared out to make room for the printing-press, in order to print the Proclamation of the Colony, and in this place, about twelve feet square, the first printing in South Australia was produced.²⁵

R.C. Harding's comment that hence it could be seen that "New Zealand was ahead of South Australia as regards the introduction of the Press"²⁶ is indicative of the mild rivalry that underlies relationships between these two Australasian countries.

In the absence of any local culture that already included printing, the Australasian settler printers typically began to create about them a workplace that was as close as possible to a replica of the one left behind. This replication not only helped to give an illusion of belonging, but also enabled them to continue their trade with as little hiatus as possible. Much as the modern spaceman survives in his enveloping spacesuit, the pioneer printers survived using familiar tools and routines and began to establish the printing trade. The Australian and New Zealand colonies were each others' closest neighbours: at first Britain was the parent culture of supply to both, but early links were also important. Because the establishment of Australian print culture pre-dates New Zealand beginnings, Australia, as neighbouring colony, was able to play a part in the establishment of early printing in New Zealand. However, because these colonial cultures were initially both derived from Britain, even developing interaction between them meant that cross influences, rather than adding diversity, were still at first, culturally speaking, British/European in character. Not only were they alike in their geographical isolation in the South seas, but, for the emerging print cultures, the parent was the same.

Many printers survived the early hardships and some began to prosper, seeding the printing business in new lands, thus helping to translate the initially British culture to the new setting, so that it not only took root, but began to flourish in an extraordinarily short time. Thus production from the early print culture of Australia and New Zealand was being accomplished far from the familiar context of the business world of Europe – in a geographical sense, in the uttermost part of the sea.

A New Socio-economic Environment

In Britain the nineteenth century rise of industrialisation with its attendant substitution of machinery for human labour, especially in the agricultural sector, had, by the 1840s led to poverty in the rural areas. Subsequent migration to cities had not solved the problem and unemployment was rife. The *Times* of August 1st, 1850 summed up the situation which caused many to try the solution of emigration.

There is misery and uncertainty everywhere...the trades, the professions, are stocked; public employment is out of the question for the commonality.²⁷

The settlers who emigrated to New Zealand built a society which W.H. Oliver has described as characterised by constant mobility in a setting of limited industrialisation and capital accumulation, as well as lacking the bases from which the class patterns of the society left behind had developed: it had neither the feudal aristocracy, the entrepreneurial middle class nor the industrial proletariat, so that, in Oliver's view, "our social evolution has gone on between a high floor and a low ceiling, and between these narrow limits we have had great mobility."²⁸ Although the classless society envisaged by Wakefield did not eventuate, social stratification was not as marked as in Britain.

In the main, New Zealand colonists were not wealthy, nevertheless the vision that was being painted for the potential settler by writers such as Charles Hursthouse in his work *New Zealand, or Zealandia, the Britain of the South*, was one of opportunity "for active men of business, possessing £2000 to £3000, and good mercantile connections in London, Manchester, and Birmingham." Prospects were seen to be advantageous especially for settlers' children. For example, the first Canterbury settlers were at pains to point out that they came as 'colonists' rather than 'emigrants', and that they were

exclusively cabin passengers—purchasers of land, and their families, who have helped to form the plan of the Colony and are going out as leaders to carry it into effect...not driven from the Mother Country...but are attracted by the prospects...not the younger sons...for the most part, but most of them are heads of families...[going] to find social room for their progeny without depriving them of the best social refinements and enjoyments...[and who are attracted by] the religious and educational provisions...²⁹

For those that made the voyage and settled in the new colony, the intellectual environment, although yet far from being characterised by a distinctively local quality, was sustained through shipments of supplies from the old country. In New Zealand, the demand for books and other printed goods was high, and many businesses were established to distribute the spoils being landed on the country's wharves. Bookshops and stationery stores were often well stocked with the latest of overseas publications to meet the voracious local demand. Hursthouse indicated that the pioneer European population, which stood at around 50,000, in general was able to afford such goods. In describing the New Zealand situation by 1857 he said that the colonists were

mostly young, vigorous, industrious, well-to-do people, engaged, more or less, in the work of producing, and well able to purchase and consume a large amount of British manufactures. Their annual raw-produce production, and their annual consumption of imported articles, is probably double the production and consumption of any 50,000 middle-class people in the United Kingdom. But it is not only the existence of a "free-consuming" European population which creates trade in New Zealand; there are some 70,000 natives who are every year becoming better customers to the merchants.³⁰

A little later, in the 1861 edition, Hursthouse encouraged professionals, including printers, to emigrate to New Zealand in order to become established in time to take advantage of the business opportunities that would be provided by the imminent population expansion that he envisioned, and that in turn would create a greatly enlarged market which could be tapped by the astute businessman.

The surgeon, the solicitor, the surveyor, the engineer, the artist, the music-master, the printer, the trader, the store-keeper, the builder, the brewer, each and every professional man...will...get *rooted*...when every emigrant of the thousands who may arrive after them, during the next five or ten years, would virtually be to them a fresh patient, or client, or customer, or employer.³¹

The printers who came brought with them technology and skill, gradually building the colonial pool of expertise. At least during the first two decades of settlement the attitude in the colony was that the essential business of local manufacturing industry of any kind was the provision of everyday necessities.³² Included in this was the fledgling printing industry, although the fact that by 1851 only seven newspapers remained of the sixteen that had been launched in the first decade of settlement indicates the economic struggle for survival.³³ Around that time New Zealand publications were occasionally being printed in the sister colony, for instance one produced to attract immigrants and capital from across the Tasman that was printed in Sydney in 1858 was entitled *A Brief Account of the Province of Canterbury Published by Order of the Provincial Government of Canterbury for the Information of Persons Intending to Settle in that Country*.³⁴

At first the print cultures of Australia and New Zealand were similar in that they sought to replicate their 'home' environment as much as was feasible in their new settings, and despite the great distance from their homeland, attempted to operate their sophisticated trade as normally as possible, if only to supply rudimentary requirements for the society being established around them. It is a feature of the printing industry that from the economic point of view, much of the financial return comes from the human input. Looking back from the New Zealand centennial year of 1940, W.B. Sutch stated that

the printing and publishing industry is the most important of all New Zealand's secondary industries, for in the processing of raw materials, the skilled worker adds more than any other major industry. His raw materials are paper and ink, and the organization and skill of the industry adds tremendously to the value of the product turned out.³⁵

In the light of the difficulties, it is remarkable that, in the realm of new techniques, even in the colonial setting of nineteenth century Australia and New Zealand, some of those who

came, and some who were subsequently born here were, in the global picture of their times, among the innovators in their industry. Men such as John Osborne, Herbert Deveril, Robert Coupland Harding and Frederick Sears were all to put forward new ideas to help further important printing developments. R.F. Watters points out that the timing of immigration to New Zealand in the nineteenth century, meant that by then the colonist was “the bearer and instrument of the new industrial revolution”: the settlers had come at a time when man’s knowledge of the world, and his understanding of the potential use of resources was greater than ever before. This translated into the fact that the industrial revolution had endowed the settler with a belief in the powers of his technology, and it was this conceptual advance that underpinned his habit of constant improvisation and innovation.³⁶

The awareness of the greater opportunity and social influence that the individual might have in the colonial setting is apparent in the early New Zealand periodical the *Southern Monthly Magazine* which stated that one of its aims was to discuss “the progress, resources, and government of the country.”³⁷ This periodical was published in Auckland by Creighton and Scales who also published Auckland’s first daily newspaper, the *Southern Cross*.³⁸ At the time of the Maori wars, the article ‘Ethics of our Colonization’ in the December 1863 issue of the *Southern Monthly Magazine* discussed the realisation in the colonies that the solution of colonial problems was not of paramount concern in Britain—the interest of politicians was primarily in local matters: “it is often difficult for a colonial question to receive the consideration and attention which it deserves at the hands of the people of the older countries.”³⁹ The consequence that problems and political dilemmas therefore would have to be worked on at the local level led to further discussion and a consideration of the personal qualities needed in the ideal settler. Characteristics that were seen as being of most benefit to the colonial society, especially in that period of internal wars were listed as: the knowledge of the political economist, practical financial skill, unflinching courage, judicial impartiality, administrative skill, benevolence and philosophical calmness.⁴⁰ The premise for colonisation as it had a bearing on the root of the contemporary conflict was also discussed. While expressing the view that the Maoris held no right “to retain in a barren state the land which is the gift of providence to the human race”, the obligation of the colonists to the Maori people was also stated: “Freedom, law and justice are necessarily elements of English colonization, [and] we are bound to extend these benefits to the Maori, if he will have them.”⁴¹

At the domestic level, an article that had appeared in the August issue of 1863 first commented on the nineteenth century changes to British social life, contrasting the status

quo in social relations that had existed "forty years ago", when domestic life had "a sense of quiet routine," characterized by sons taking a fathers' profession, daughters marrying locally, and children within reach, with the perceived new order of the times, when it was to be expected that a family may not even see the children at Christmas; but instead communication was more likely to come in the form of

letters from distant countries, some of which were hardly discovered when father was a boy...[which] will tell of Christmas festivities taking place in the midst of flowers and birds and green leaves, and the glaring beams of a tropical or midsummer sun, whilst their writers are all playing a part more or less important in the founding of new empires and the birth of fresh states.

Turning to those who had emigrated, the social change was seen as a discontinuity, bringing both opportunity and obligation, but of a new order:

We should all be anxious that the influence that we all of us, either for good or evil consciously or unconsciously, are lending to the course of events is in the right direction, and it is peculiarly important that this point should be carefully remembered and acted upon by those who are assisting ...to lay the foundations of a new society or settlement; for in these earlier stages of the progress of a new country, individual character often exerts an influence, and is potent for good or evil to a degree impossible in an older country.⁴²

A society with a culture of print, also inherently possesses the opportunity for the individual to cast influence by several means, by virtue of the fact that printing is multi-faceted. Print has not only served the industrial/commercial features of business and the interests of society and politics by its ability to efficiently disseminate knowledge and ideas, but also the purposes of the artist or craftsman in visually expressing a view; in such ways reflecting the current interests and identities of society at large. With the establishment of print culture in the new socio-economic setting, all of these means of influence became available to the colonials, to exert influence on both cultural character and direction.

In retrospect it has been seen that the socio-economic vision of the colonists often had not been synonymous with their experience. The social historian Miles Fairburn has described the reality of nineteenth century life in colonial New Zealand and has found that it differed from the Arcadian view held by many of the colonists that "an environment full of opportunities for material acquisition and self-betterment would necessarily lead to moral improvement, contentment, social harmony and social equity". Fairburn has contended that in fact many of the settlers experienced the opposite, although, because of the wish to believe that the society was ideal, as well as the "desire to boost New Zealand's virtues in order to attract a sufficient flow of immigrants and capital...", the reality was rarely expressed. In fact the opportunity for individualism and the relatively high standards of living which many were able to create was inseparable from an 'atomisation' that developed, with attendant "high rates of loneliness, drunkenness, and interpersonal conflict; [and] a low propensity for group or organised conflict and status competition."⁴³ Fairburn

commented that these conditions were in fact inherent in the very Arcadian dream which brought many of the immigrants to New Zealand in the hope of escaping the problems of “hierarchy, class conflict and oppressive status conformity” of the Home country. He expressed the view that “New Zealand secured itself from collective enemies on one front at the price of being infiltrated by individualised enemies on the other.”⁴⁴ In her chapter ‘The Pioneers’, in *The Oxford Illustrated History of New Zealand*, Janine Graham’s view corroborates these findings. Graham refers to images of New Zealand that were produced in the first thirty years of the colony, concluding that, at least up until 1870, even the illustrative record lacked “love, laughter and the spontaneity of life”, and that rather “the visual image is overwhelmingly one of the pioneers as serious individuals.”⁴⁵ However, the unhappiness that the condition of loneliness may have brought for many could be seen as the condition required by some. For example, for the artist, solitude can afford a return to the self, facilitating expression in the form of the artwork through which a continuing influence may be achieved.

The influence of the individual as artist was present in nineteenth century New Zealand, and was linked to printing in several ways—through the artist as originator of works, some of which were later committed to the printing surface, the artist as designer of commercial print products and the artist as individual print-maker. In all these roles there was the possibility of the inclusion of colour as an element of artistic expression, both as a tool and as part of the emotional response to environment. It was not until the end of the century that New Zealand artists were beginning to make images that reflected a feeling of identity with the New Zealand environment, but not long after, when in 1914 World War I again called forth a greater identity with Britain, this went underground, and it was not to be until later that New Zealand artist print-makers were to make greater use of colour printing as a medium. (See chapter 11.)

Colonial Production - The Industrial and Business Environment

Although printing was an early part of both Australian and New Zealand colonial life, local commercial production was at first characterised by its very small volume, which was in keeping with the nature and environment of the new Antipodean colonies where there were comparatively tiny populations. Cost effective mass production was far from being an option on these shores, and settlements were still very localised in their affairs, the rigours of the terrain being a primary limiting factor. Consequently the fragmented settlements were unconnected by land, and this major factor did not at first facilitate the ease of interaction necessary for the growth of a wider business and social context. Rather business was

conducted more on a regional scale in New Zealand, around the main centres of Auckland, Wanganui, Wellington, Nelson, Christchurch and Dunedin, and as well as around such minor nodes as New Plymouth, Napier, Westport and Timaru. In Australia, this centralisation was around the capital cities of the states, so that each state began to develop feelings of identity with the respective capitals, Sydney, Melbourne, Hobart, Brisbane, Adelaide and Perth, all of which were seaports.

The trading pattern, essentially based on seaport nodes linked by coastal shipping, had developed from the fact that many of the southern colony cities originally had been established as bases for sea-going whalers and sealers before organised European settlement began. After the establishment of the New South Wales penal settlement in the late eighteenth century came the impetus to exploit the neighbouring New Zealand resources, such as flax and timber, and by 1830, the year that the Reverend Yate brought the first press from Sydney to the Bay of Islands, and on which was accomplished the first printing in the country, the nearby Kororareka (later Russell) was a thriving trade depot. It was natural that the connection with New Zealand for trade had brought it under scrutiny as a possible colony.⁴⁶ After the British annexation of New Zealand in 1840, many of the whaling depots and trade centres became permanent settlements. Gradually infrastructure was constructed and communications were enhanced: all necessary to support the emerging land-based economies which soon became characterised by a reliance upon a few staple exports, at first wool and later grain, and later, especially in New Zealand with its twelve month growing season, dairy products. From the early eighteen eighties, refrigeration meant that meat export was feasible and henceforward became important to the economy. The first shipment of frozen meat occurred in 1882, and by the nineties, increasing ability to export meat and dairy produce helped to end the long depression that had begun in the seventies.⁴⁷

It can be seen that the New Zealand pattern was one of an economy of primary pastoral industry initially, followed by the addition of agricultural rather than manufacturing industry. Although the relatively early discovery of gold in Australia and New Zealand boosted population and export earning at the time in both places, the later discovery of the requisite iron and other raw materials that paved the way for heavy industrial development in Australia was not paralleled in New Zealand where the economy remained primarily based on farming, with local secondary industry largely an offshoot. Especially during the nineteenth century these colonial economies were centred around the fact that they essentially constituted remote British farms, and as such they were dependent economies, relying on a trading pattern that involved a heavy investment in shipping transport. Trade

with Australia which in the nineteenth century had reached a peak around 1889 had also been of particular importance to New Zealand.⁴⁸ British investment had also underpinned New Zealand development:

The colonial government invested considerable sums in communications, particularly after [Julius] Vogel obtained British loans in the 1870s. Government and business made the most use of the new telegraph system, which facilitated the centralisation of political administration and the abolition of the provinces in the mid-1870s and the growth of the regionally and nationally based businesses, such as the banks, thereafter.⁴⁹

The dependent nature of the New Zealand economy on which the printing industry was in turn dependent was underlined by the fact that it was a rise in British prices around the middle of the nineties that lifted the economy, just as the basic underlying factor that earlier caused a downturn from the middle of the seventies had also followed “the continued downward course of British prices, interest and wages.”⁵⁰

It was during the period of nineteenth century investment in New Zealand to about 1860 that an enduring economic pattern mainly based on land speculation had been established on which was built the backbone rural farming economy supporting an essentially pastoralist society. Those engaged in urban business were likely to be engaged in the necessary supporting service and supply industries. Print production in New Zealand, especially in the main centres, was a part of this developing town-based secondary industry which was dependent in turn on the economic health of the dominant farming concerns. Much job printing served public institutional needs, and printers sometimes gained extra work generated from this sector, for instance, when New Zealand became the first country to grant women the right to vote. In July 1892, R.C. Harding commented that although “one thing is clear – the country has made up its mind to confer the female franchise”, he added that it was not so clear what the results would be; but that it was certain, however, that “printers will rejoice in the double bulk of the rolls.”⁵¹

One of the prerequisites for all commercial development, including commercial printing, was capital: human capital as well as money. Sources of investment during this formative era in New Zealand have been delineated by historical geographer Alan Grey as having been firstly the immigrant money, goods and skills, and secondly British and Australian investments, chiefly in land, but alternatively in sheep that were run on leased land. Later, private and state investment allowed a tourist industry to germinate, as “increasing prosperity and improving roads enabled the country to display its beauties, curiosities and wonders”.⁵² During the period under study, businesses, including those connected with print production, were faced with a variety of limiting factors, which included the rawness of the physical environment, the “continual and severe shortage of capital and labour”, instability

caused by the Maori wars, as well as the ups and downs of an export oriented economy that was subject to sudden slumps. R.F. Watters saw all these factors as contributing to a certain institutionalisation in the commercial production, distribution and exchange sectors, dynamics which he viewed as “certainly a most distinctive characteristic of all forms of social and economic development in New Zealand,” where institutions such as credit agencies, loan boards, and local and government agencies functioned both to protect individuals from natural and economic hazards and to facilitate the improvement of production.⁵³

For commercial health to prevail, sustained returns on investments were needed, and the achievement of this relied on the continuing development of local colonial products and the markets for them.⁵⁴ Such a principle applied not only to the major commodities but also to all business sectors, including the developing printing industry. This fact was brought home when the long depression of the eighties provoked protests that the economics of the printing industry was being affected negatively by the perceived fact that the government was sending too much printing offshore. W.B. Sutch commented that it was the gradual reversal of that situation which ultimately caused positive change, as it “altered the economics of the industry and ...aided the introduction of better machinery and more variety in methods.”⁵⁵ As well, from the early nineties onwards, the general economy improved, as rising world prices, the development of the frozen meat trade, manufacturing industry and dairying helped to increase wealth and provide a sound foundation for an increasing population.

Antecedents of Colour in 19th Century Antipodean Print Production ***Australian Print Culture Pre-dates New Zealand European Settlement***

When the first fleet sailed for Sydney in 1788, northern hemisphere interest in the natural environment, kindled by the earlier sea voyagers, continued. Direct observation by such observers as John White who was not only the chief surgeon on the voyage, but also a naturalist, often resulted in later publication. For example, illustrations for one of White's successful books, *Journal of a Voyage to New South Wales*, published in London by J. Debrett in 1790, included depictions of new animals encountered, such as Snake, no 5, which appeared in colour in browns and greens.⁵⁶ The way in which this book came into being was to become a usual pattern for material concerned with the colonies, that is, of the recording of data being carried out in situ and the printing and publishing function being repatriated to the other side of the world, especially if colour was intended as part of the production. At the time, much of the coloured image-making for such books still required

the colour to be added by hand, and this situation was to continue in the nineteenth century, until more affordable means were more commonly in place for colour to be added by means of the press. Nevertheless, the desire to convey that part of Antipodean information concerning colours encountered was often strong enough to result in the extra effort being made to provide this aspect as part of many a publication on a colonial subject, in spite of the laborious and costly nature of the task. This was especially so where the aim was to convey information as to the actual appearance of the natural environment.

First Local Prints in Australia

For the first four decades of its existence, before the period under study, the small Sydney settlement, mainly penal in nature, had little use for local printmaking or the means for producing it, so that very few relief or intaglio prints were made in those early days.⁵⁷ The first print that was produced for separate issue was an engraved view of Sydney produced by W.S. Blake in 1802, and around this time John Lewin was producing local engravings to illustrate his books on insects and birds.⁵⁸ A decade later, also in Sydney, Absalom West established the first business to produce prints for sale: this was not until around a quarter of a century after settlement. However, engraving skill was at hand: several engravers were engaged to engrave the plates, the best known being Walter Preston. Thomas Bock appears to have introduced engraving into Tasmania in 1824, while the first engraving had been accomplished in Melbourne in 1838 by Arden and Strode, who must have had a rolling press, as they were able to carry out copperplate printing.⁵⁹ By 1821 in Sydney, the governor, Sir Thomas Brisbane had brought out two lithographic presses with the intention of printing antipodean star maps, this activity being part of his pursuit of an interest in astronomy, rather than for any commercial purpose. The first had come from Rudolph Ackermann in London.⁶⁰ Also about this time, as the free population began to increase, the market for decorative prints began to open up. Thus it was that, using one of these presses, the first lithographic prints to be made in Australia were produced by the artist Augustus Earle in 1825. Print making in the early nineteenth century was mainly concerned with the depiction of images drawn from the new environment to which the settlers had been transported. However, in general the publication of such images was accomplished "in Europe until the 1840s and 1850s, after which time it became general practice to publish them in Australia."⁶¹ Arden and Strode had been instrumental in the introduction of lithography to Melbourne, as it appears they had a lithographic press by 1840.⁶²

Most image making concerning colonial Australia was initiated with an illustrative purpose in mind. Examples were the hand-coloured aquatints produced by Joseph Lycett, who had

originally been transported to New South Wales as a convict, but who returned to England after being granted a pardon. Lycett produced the plates for the 1824-25 *Views in Australia or New South Wales and Van Diemen's Land Delineated*, a work that was published in London. In fact at the time most books of images concerned with Australia were being printed in Britain. Another example, also a view-book of note, was produced in London a decade after the planned settlement of Adelaide: the 1846 publication *South Australia Illustrated* by George French Angas, the son of one of this free colony's founders. The medium used to reproduce these images, which depicted a pleasant impression of life in that colonial setting, was the hand-coloured lithograph. This was also the period in which John Gould's famous images of Australian birds and animals were produced for publication in the books he published in London, for instance *Birds of Australia* (1848), in which some hand-coloured lithographs of New Zealand birds appeared, and *Mammals of Australia* (1863), in which the illustrations were also in colour.

Early Missionary Printing in New Zealand

Because printing was imported to New Zealand at first with the missionaries and then with the settlers, the development of printing in New Zealand was closely related, albeit with differences, to developments in Britain and Europe, as well as to similar development in other colonies of British settlement, for example, those in Australia or in North America, where printing was also, initially, an export from the home country. James Traue has explained that "there are two different histories of the book in New Zealand in the nineteenth century, that of the Maori language book and that of English language printing and publishing,"⁶³ a view that bears on any research into the history of book and print in this country.

In 1830 print had been introduced and became a major means of interaction with the Maori people, affording the early missionaries the technology to aid their cause of educating the native race and of propagating western religious ideas and artifacts. In his letter of 25th September 1834 to another clergyman the Rev. Samuel Marsden wrote that the native people were very receptive of missionary activity.

I have had some chiefs with me lately, begging for missionaries.... Since I began my letter a chief and his wife have arrived from the South Cape, and are with me. His object is get a missionary to reside at his settlement. I introduced him to the Governor, in order that he might tell his own story...I intimated to his Excellency that the Government and merchants ought to assist the society with means to supply the natives of New Zealand with instruction, as that island promises to be of such great importance to N.S. Wales and the whale fishery. The Governor promised the chief some presents of several articles he wanted....The Chief...told me he wanted no guns; he wanted missionaries.⁶⁴

In New Zealand, through the labours of the missionaries, who also were the first to set down

the Maori language in written form, printed matter such as pamphlets, broadsheets and occasionally books were produced. That any printed publications at all eventuated is to be marvelled at, but, for printing, pioneers such as William Yate and William Colenso broke in the land in New Zealand, producing Bibles and other religious materials in the very early years. In September 1830, at Kerikeri, the Reverend William Yate and his assistant James Smith had first printed some hymns and a catechism in the Maori language in New Zealand.⁶⁵ Almost from the beginning, as well as letterpress, some lithographic printing was used, the earliest lithograph probably being a lesson sheet, a text without title, date or imprint that was produced on a lithographic press brought out by William Wade in 1834. (See chapter 4.)

Illustration was evident in this early era, for example, on the 1835 cover-title for the main run of Colenso's first Paihia printing of the Maori translation of the *Epistles to the Ephesians and Philippians*,⁶⁶ later named by the well-known New Zealand publisher Mr. A.W. Reed as "the first book worthy of the name printed and published in this country."⁶⁷ Appearing only a short time after Colenso's arrival on 30th December 1834, this was a case where colour had been introduced quite accidentally, the proofs having been pulled on February 17th 1835 on pink blotting paper obtained from the missionaries' wives because paper supplies were at a premium: supplies from Britain were eighteen months distant, and even from the closer Sydney there was six months to wait.⁶⁸

European Settlement

It was on 29th January 1840 that Captain William Hobson landed at the Bay of Islands, and the next day proclaimed an extension of New South Wales to include New Zealand. Under instructions he "[entered] into negotiations with the Maori chiefs for the cessation of sovereignty. The outcome was the Treaty of Waitangi of 6 February 1840, which ceded the sovereignty of the islands to Queen Victoria, who in return conferred on the Maori people "all the rights and priveleges of British subjects".⁶⁹ "In a second proclamation Hobson declared invalid all land titles in New Zealand unless confirmed by the Crown. Port and Excise taxes were also levied."⁷⁰ The fact that the British already had interests in New Zealand had eventually led to its British annexation, following fears of racial unrest as the flow of prospective settlers from New South Wales increased, especially following a series of drought years at the end of the eighteen thirties,⁷¹ and as well, fears that the French were preparing to lay claim to these South Pacific islands. After settlement, New Zealand newspapers were established astonishingly quickly. For early settlers, the familiar print products, especially the newspaper in its familiar print format, which carried news from

home as well as from the local scene, provided communication that was vital to the emotional, social and business needs of the new colony. The prodigious growth of the newspaper element of print culture in colonial society met the obvious need for ongoing news about people, events and the world in general. Augmented by notices, advertisements, articles, and later, pictures, newspapers were a necessity for a society wishing to maintain its accustomed culture and desirous of constructing an environment conducive to a feeling of normal life. Newspaper advertisements provided information on where to obtain the goods and services needed to achieve this replication of the places the settlers had left behind. For the settlers, the daily papers functioned in this regard both as comfort and convenience.

The publication of the first New Zealand newspaper, the *New Zealand Gazette* “in Samuel Revans’s raupo whare on the banks of the Hutt River”⁷² on the 18th April 1840, was a small miracle, an early achievement for the incipient print culture of the Wellington region. It was the second edition: the first had been published in England on 21st August 1839, before the *Adelaide* set sail, and in between these first two numbers had been the long sea voyage.⁷³ This was an accomplishment that engendered confidence for the future, and was indicative of the courage, resourcefulness and resilience of these early men and their families.

Sometimes a printing press was brought in the same ship with the settlers, as it had been to Wellington, and as it was a little over a decade later, when the first four ships sailed for Christchurch. On arrival at Lyttelton on Dec 16th, 1850, supplies were landed from the *Charlotte Jane* and the press was set up not far from the wharf in a shed on Norwich Quay. Within the month, on January 11th 1851, volume 1 no1 of the fledgling newspaper, the *Lyttelton Times*, came off the press. For this paper, supplies of types, paper and ink also had been sent out to last the first year. Thus the new settlement was provided with the almost instant transfer of a familiar element from the culture left behind. In the article ‘For Gospel and Wool Trade: Early Printing in New Zealand’, Roderick Cave and Kathleen Coleridge have pointed out that each New Zealand Company settlement except New Plymouth included a newspaper among its first facilities.⁷⁴

The work of the early colonial printers constitutes a remarkable feat in the face of the obstacles and hardships that they were required to overcome, as they simply got on with the job in hand. In these circumstances, the printer was expected to accomplish the task of publishing the printed word to standards learnt in another context, in a place that was now at the other side of the world: there was to be no easy going back. The way forward was

closely tied not only to shipping that would supply equipment and bring trained tradesmen, but also to the resourcefulness of the early printers. Many of the printers who came to Antipodean shores as early settlers must have had special qualities: they dealt with the challenges of the pioneer period while yet still having the energy to practise the skills of their trade, often in makeshift surroundings and using improvised equipment. Having survived, seeded and begun to nurture the art of printing in a new land, relationships began to be forged and a tentative new culture began to be established, although with a strong dominance of the elements of the old, the known and the tried. When supplies to these remote colonies dried up, and new ones failed to arrive, imagination often came into play as elements found in the new environment were sometimes tested as possible substitutes for essential requirements. For example, the need for lithographic stone led to an early trial of west coast limestone as a substitute in New Zealand for Bavarian stone, although in this case the substitute did not prove to be suitable and printers had to continue to import supplies.⁷⁵ Across the Tasman, writing in 1860, the Sydney colour printer Johann Degotardi mentioned that there had recently been some success with using the native iron-bark for wood-engraving as a substitute for the traditional box.⁷⁶

It was in this climate that, in spite of setbacks and hardships, Antipodean print cultures had begun to develop. A primary need had been for print to keep the settlers in touch with what was topical, both in their own pioneer society and in the one that they had left behind. As population rose, the market for the dailies and the weeklies steadily increased, and poems, short stories, and articles on a wide range of topics were carried. Some of the elements of the more sophisticated print culture left behind in the Old Country that had been more characteristically found in magazines and books, the more costly productions that were yet to take root in the colonial society in viable forms in New Zealand, were appearing in newspapers. Another feature mentioned by James Traue was that “the newspaper in New Zealand seems to have picked up a great deal of the retail advertising that would have gone into posters and fliers in Britain.”⁷⁷ This simplification of the medium facilitated the primary objective of the provision of a regular news service: other formats had to wait.

Also in the interests of simplicity, black ink printing was paramount. The only appearance of colour in a colonial newspaper was completely unintended: it was the paper that was coloured rather than the ink. Because of early paper shortages, appeals to readers had brought forth paper in a variety of colours. It is known for instance, that the *The New Zealand Spectator* and *Cook Strait Guardian* occasionally came out printed on “red blotting paper, [and that some] specimens are extant printed on green and blue.”⁷⁸ As printers strove

to make use of the northern hemisphere technical developments it was not until the eighteen sixties that colour printing made its debut, and then only in a very specialised way. In New Zealand, the road leading to the regular appearance of colour in that ubiquitous print product, the daily newspaper, was to be a long one.

Bridging the Gap and Keeping in Touch

Communication Across the Oceans: The Influence from 'Home'

The early New Zealand settlers continued to seek familiar print products from home, especially reading matter in the form of books, magazines and newspapers, including illustrated items. The following examples, parts of letters written by John Godley's wife Charlotte from Wellington to her mother back in England are indicative of the thirst for such items from 'Home'. On May 3rd, 1850, Charlotte wrote:

Will you please let the *Illustrated News* be sent to us? I quite forgot it before, and it will be a splendid thing for Arthur, as well as the bigger children", and later, on July 31st, "On Monday we went on board the *Acheron* to see her...Captain Richards took us home again in one of the ship's boats, with a lot of *Examiners* lent to my husband by the gun-room. It is quite characteristic, the way in which he manages somehow to see and read newspapers, and everybody here who gets any sends them to him, and he reads all, and longs for more."⁷⁹

That there was a ready market for books and other reading matter produced overseas was a signal to agents and booksellers to obtain and distribute supplies imported from the Old Country. In response to the demand, such businesses soon proliferated at least in all the main centres in New Zealand, and by this means colonists were provided with access to such overseas production, albeit delayed in delivery by the long sea voyage.

Although the market desire for all kinds of printed materials was there and local printers often showed considerable enterprise in acquiring new skills and trying new processes, the small population was a limiting factor. The economy of scale that would aid success for a business enterprise attempting to take on production of a full range of printed matter was as yet lacking in New Zealand. Throughout the period under study, Antipodean printers were not able to emulate the output from the businesses of their northern hemisphere counterparts. As well, the orientation of the colonists was strongly to the Old Country as far as the production of the more ambitious and permanent forms of print production such as books were concerned. This was to continue into the twentieth century: overseas publishing houses had soon extended their markets to include Australia and New Zealand, and this competition was ongoing.

In spite of the strong cultural influences from Britain, over time, a recognisable New Zealand voice began to be reflected in its print production, incorporating a special mix of both indigenous elements and those that sprang from other roots. As New Zealand's pakeha inhabitants made a home alongside the traditional peoples, each contributed to a dynamic

New Zealand culture. By the beginning of the twentieth century, New Zealand texts and images were reflecting many aspects of the unique physical environment, as well as facets of its multi-cultural peoples.

Colonial Printers & Communication: The Trade Journals

It is true to say that success breeds success—the achievements of the pioneer printers were many. Not only did they have to maintain skills learnt before they had voyaged to New Zealand, but soon began to demonstrate that they were attempting to keep up with many of the print culture developments in both the Old World of the time, and the New World of printing in America. They kept in touch, often by means of the printed word itself. Through this means the trade journals acted as a lifeline as they helped to keep New Zealand printers nourished professionally. The printed word is another manifestation of speech, which together with fire and tools, has been considered to be one of the legs of the tripod of civilised human culture. Culture itself may be viewed as a collection of “behaviour patterns, institutions, values, bodies of knowledge and systems of belief,” the character of a particular culture being reflected by the concerns and interests of its individuals and the patterns of interactions between them, including the values that guide their activities.⁸⁰ Acting as vehicles of communication with the trade, the journals not only conveyed knowledge, but also contributed to the intellectual environment of printing professionals, so feeding and influencing the developing cultures.

As pointed out by Roger Chartier, the ‘space’ between historical figures is an important element of the culture in which they lived.⁸¹ For print culture, the trade journals occupied a part of that space, and provided a means of communicating across the many geographical separations that had developed in Western print cultures by the time printing began in New Zealand in the 1830s. By the end of the century when the photomechanical revolution involving many branches of the trade was in progress, bringing with it many new processes to be tried, especially for colour printing, H. Snowden Ward wrote in the *Process Year Book* for 1896 that “the trade journal, rightly conducted, is an educator.” He saw the trade journal as making trade information that was otherwise often difficult to obtain “easy of access”, as well as being instrumental in counteracting schemes that at the time were being perpetrated to sell processes that were “useless fakes” for large sums.⁸²

Recourse to some of the nineteenth century trade journals that reached the Australasian colonies shows that they contain a wealth of detail concerning the latest printing processes, including colour processes, as well as information concerning related technical improvements, for example, in photography. Discussion of processes and equipment as well

as of the skills needed for their beneficial use in business frequently appeared, and columns devoted to hints and 'trade wrinkles' were a regular feature. Articles contributed by acknowledged authorities of the day, such as William Gamble, editor of the English journal the *Penrose Annual* often appeared. Many a colonial Australasian printer must have tried a new process by following instructions from a manual that had been published on the other side of the world, and as will be seen in chapter 7, word of such publications often came by means of a trade journal.

Colour Printing and Some Overseas Trade Journals

Devoted to the colour printing process from which it took its title, *The Chromolithograph*, published in England from 1867 to 1869, had the potential ability to convey a sense of the state of the art, although in this case, to fulfil such a purpose, the journal had come rather late. By this time experimentation was beginning to move into the newer photographic processes that were to eventually succeed in taking over colour printing practice, at least in the commercial sphere. Later journals, such as the *British Printer* and the *Penrose Annual* better fulfilled this function, and were widely educative as well as influential in raising standards in the printing trades. However, a journal such as *The Chromolithograph* would have been expected to have been of interest to the New Zealand colonial printer attempting colour work, in a situation in which chromolithography, which was to be an enduring colour printing process here at least until the end of the period under study, was only just becoming established in the sixties.

The New Zealand Trade Journal *Typo*

In New Zealand, Robert Coupland Harding often drew attention to the trade journals as sources of inspiration, advice and excellent example for printers, especially for those in the colonial situation at distance from the main centres of teaching, practice and production. For instance, writing in *Typo* in 1891, Harding pointed to the November/December 1890 issue of the *British Printer* that had just arrived, saying "the title-page to the volume, in colours and tints, is the finest yet issued—a superb piece of designing, engraving and presswork."⁸³ However, he qualified the statement, commenting that such an example, involving a design for several colours "that had been specially prepared and arranged to combine with the type work" was of not much practical use to the ordinary job compositor. Realising that while such models of achievement might stimulate the colour printer to greater effort, but that emulation of some of the more advanced work shown in such a journal was beyond the reach of the average colonial printer, Harding believed that there was a place for advice directed especially to the New Zealand printer, and to that end, had begun his own journal *Typo* in 1887. Thus it was that communication was not all one way. *Typo* was to cast its

influence, not only within the New Zealand trade, but also back across the waters, to Australia and beyond—to the Northern hemisphere printing centres. On page one of the first issue published in January 1887, Harding said: “It is our design to issue a journal representative of the printing, publishing, bookselling, stationery, and kindred interests, and to provide a recognized channel of communication between those engaged in these industries.” (Literature Review: 34.)

Harding also made it clear that his aim was to be *prominent*, and that he intended to present matters of interest to the trade not dealt with in the newspaper press, such as practical notes and suggestions, laws relating to the press, new inventions and processes, as well as new publications, the last not only to bring information concerning sources of printing knowledge to the notice of the trade, but also to promote the wider circulation of colonial publications by bringing them to notice in reviews. Harding commented that “owing to the absence of any literary review or other organ appealing directly to the bookselling trade, some of the most useful publications in the colony have succeeded in obtaining little more than a local circulation.”⁸⁴ He appealed at once for the co-operation of the trade, stating that he perceived there was a gap to fill and therefore a niche for the publication. Harding’s words were echoed in the *Penrose Annual* nearly a decade later, where the trade journal was characterised as being potentially “the medium of help, and even mutual warning” with its strength depending on strong management together with support from the craft, each contributor helping the educative function. By such means the craft as a whole was improved and competition “from half trained outsiders” was cut.⁸⁵ That printers’ livelihood depended on providing a superior standard of work is implicit in this comment, and is a theme that was often reiterated in *Typo* as applying to all printers, including colour printers.

In his 1940 history, R.A. McKay stated that “the impact of Coupland Harding’s theories on typography in New Zealand cannot be over-emphasized.”⁸⁶ Although one nineteenth century observer, W.H. Foden, had commented in 1888⁸⁷ that many printers may not have been interested in accessing such a journal, nevertheless it is evident from comment given in his own times both in trade journals being published elsewhere and in newspapers at home, (and often reported by Harding), that not long after its birth *Typo* had begun to make its mark both at home and overseas. In the second issue, in February 1887, Harding remarked that already *Typo* had been received favourably by the press in New Zealand. An example that he printed, the “verdict of the Waipawa Mail”, declared:

Typo is gaining not only a colonial, but a world-wide reputation. How can it be otherwise, when so much taste, artistic skill and judgment are bestowed upon its production? Its technical columns are worthy of the

great subject on which they treat. Every compositor of the land should have his *Typo*. And no-one interested in the printing business should fail to support it.⁸⁸

He received such comment as encouragement to continue with the main objective of the paper: "above all [to] be of practical value".⁸⁹

Typo and Information for the Colour Printer

That Harding had a genuine interest in raising trade standards and keeping printers abreast of the latest and best through *Typo*, rather than having a purely profit motive, is attested by the fact that, in his regular critical series 'Our Exchanges' he reviewed other trade journals favourably if he felt that was deserved. For instance, in May 1890, Harding commended to the trade the London *Printing Times* for keeping well ahead with technical articles, pointing to the appearance in its March issue of "a beautiful illustration from a half-tone process block." Turning to the January/February *American Art Printer*, he mentioned that this journal contained "some beautiful 'process' supplements." Harding regarded *Paper and Press* as usually including intelligent discussions of the latest improvements: "no other journal enters so fully into these matters or is so complete a record of the progress of invention."⁹⁰ The *British Printer*, considered by Harding to be "both practical and artistic," was commended to *Typo*'s readers earlier in the same year when he declared the tenth number to be "one of the finest yet issued...full of fine examples of typographic design, in black and in colors, all printed in the best style."⁹¹ Clearly, R.C. Harding was indicating material that would inspire the colonial printer, including the colour printer who was so remote from the stimulation of the Old World centres of printing innovation and excellence.

Communication within the trade, partly facilitated by trade journals, increasingly included discussion of topics for the colour printer. Over the roughly ten year course of its life, Harding's journal regularly catered to the interests of this group, especially within the specialist series of articles on typographic decoration written by Harding himself. The journal often featured letterpress colour printed titlepages, showing by example what could be done in New Zealand where, technically speaking, the bread and butter work of newspaper printing created a largely letterpress environment, and where jobbing work was typically the partner to newspaper printing, especially away from the main centres. This environment allowed for a more even usage of both machinery and workforce, and helped to make the business operation both more efficient and effective, the latter by the diversification of both product and customer.

In his study of New Zealand pamphlets printed in New Zealand to 1889, a major class of the jobbing press production, Peter Hughes (1998) pointed out that "there is no reason to

believe that the importance of jobbing work for the New Zealand trade would differ in any significant degree” from the job printing in nineteenth century Britain, where, as reported by Simon Eliot, by the end of the century the total value of jobbing and general printing exceeded that of either of the print product categories ‘newspaper and periodical’ or ‘printed and manuscript books’.⁹² In early 1887 *Typo* recorded statistics concerning New Zealand printing establishments which at the 1886 census had totalled 135, the highest number at the time being in Otago (36).⁹³ This was the year before *Typo* began publication, and by this time it was probable that jobbing printing accounted for a great proportion of total print output in this country. That jobbing was increasing in importance is borne out by Noel Waite’s comment that by 1890, “a survey of 14 Dunedin printing offices [had] listed ten firms solely concerned with jobbing work, three combining jobbing and newspapers, and one...that did newspaper work only.”⁹⁴

Hence Harding’s two great emphases, represented by the continuing series on ‘Display in Typography’ and the regular column that was the vehicle for the criticism of type specimens, were appropriate to trade audiences both at home and abroad. It was in the less ambitious and therefore less costly productions of jobbing printing, the cards, posters, programmes and the like, that there was more freedom to try new concepts in design and colour without too great an outlay in either time or capital, especially where existing machinery could be used for new enterprise. In the case of jobbing printing, where colour effects could be more cost effectively employed, the economic risk was ameliorated if the expectation was that the element of colour could become a market advantage, especially if skills to execute it meant that customers could rely on work of high standards. In 1896, in the period towards the end of *Typo*’s run, H. Whetton, who was at the time editor of the *British Printer* said of the importance of jobbing printing:

But jobbing – comprising as it does, the best efforts of all in design, color, and general production – may be safely taken as a backbone of more or less competition, together with half-tone printing, which possesses particular interest just now.⁹⁵

The trade journals and other educational publications, as well as trade exhibitions and the emigration of personnel all helped to ensure the continued communication of information on the latest printing trends, so facilitating diffusion of printing developments and improvements to Australia and New Zealand not long after their overseas debut, even in the first few decades of the colonies as they carried information between printing nodes, including between the main nodes in the Northern hemisphere and those developing in the Australasian colonies. Especially before overseas agents made regular visits, the trade journals particularly were serving as mediators, and carried influences that affected the

social, technical, and intellectual aspects of the transmission of many print culture developments, including those that were relevant to colour printing.

By the last two decades of the nineteenth century, through the discerning Robert Coupland Harding, this discourse had become two-way as the colonial *Typo* was becoming influential in the wider global print culture. In the colonial situation where the emphasis had to be on the development of essentials, one would expect that in the printing industry the core business of providing the more easily produced and cheaper print products in black and white may have precluded much interest in colour printing. However, the fact that there are many references to colour printing in *Typo* shows that there was considerable interest in the subject in the colony by the time of the life of the journal, and practical information was needed. Such interest partly reflected the fact that colour was by then a popular aspect of the transmitted Victorian print culture, so that there was a market for it, but partly that local printers were also using colour.

Harding's articles were of real practical value, not least in raising typographical standards which were then at a low level. New Zealand colonial printers had emigrated at a time when English standards were in decline, so that they had, as A.H. McLintock put it, "inherited a bad tradition, and the untidy struggle of pioneering provided neither the men nor the means to improve it."⁹⁶ Following in the more recent English tradition of printers such as the Whittinghams, Harding, by concentrating on the principles of good design, gave valuable guidance to the printer, especially the jobbing printer who was by this time faced with a wide variety of choices due to the huge increase in processes and equipment that had occurred with the photomechanical revolution. Part of the guidance was of particular relevance to colour printers who were increasingly putting this string in the bow, not only in the 'Home' country but also in the Australasian colonies.

Working from principle to particular, Harding saw that, for the display side of printing which often included the use of colour, the basic concept of light and shade, embodied in the fundamental principles of harmony and contrast, was the over-riding concern. Such views underlay much of Harding's critical and instructive writing on other aspects of colour printing. For example, under the heading 'Trade Wrinkles', one item written by Harding gave instruction on the subject of 'Harmony of Tints':

Gray sets off a color better than either black or white. White, gold or black will serve as an edging to any color. A white ground has a tendency to make colors upon it appear darker, while a black ground has a contrary effect....⁹⁷

An independent thinker, Harding published his views on a wide variety of matters of interest to the trade, but in the doing also introduced many clues for the historical researcher. For instance, wishing to give encouragement to local enterprise, Harding wrote on the subject of the colour printed Christmas cards produced by A.D. Willis of Wanganui, stating that among the many lithographic establishments, Mr. Willis's is the only one to have "made any attempt at fine-art work."⁹⁸ Harding mentioned also that Willis' ball programmes were well-known to printers, and his greeting cards to booksellers, concluding: "To both trades Typo's advice is: Encourage local industry."⁹⁹

In the May 1890 issue, Harding commented at length on the views expressed in *Paper and Press*, reporting that "the editor is of the opinion that 'the color-printer is the coming man'", although that by the title 'color-printer' he meant more than the job printer with the ability just to add a little red ink—rather the printer who must "possess sufficient skill to produce perfect register, must have correct ideas of the harmony of colors, the distribution of masses, the style of ornament called for, the character of type-faces, the tint of paper necessary to harmonize with the inks made use of... in short he must be an artist."¹⁰⁰ Harding's opinion was that "in the States, the color-printer has already appeared", but "in these colonies there are colored inks, but few printers who have any idea of their use, or having the idea, can find any field for its exercise."¹⁰¹ (See also Section VI.)

Personal Contact: Tradesmen, Travellers and Settlers

By the end of the nineteenth century, as well as ongoing contact and communication with those who emigrated from the northern hemisphere and that between tradesmen and travellers moving especially between Australia and New Zealand, agents from the Penrose Company had begun to visit Australasia. In the last decade of the century, they came to the New Zealand colony often via neighbouring Sydney. Such personal communication was seen as a godsend, at least by New Zealand printers. Here was a kindred spirit to help keep them in touch with the latest trends from the parent culture, where activity in the printing world was at the time so innovative and stimulating, and where print production was huge and various compared with that of the New Zealand industry, which was at the time still characterised by remoteness, itinerancy and the isolation of the individual, and where, as will be seen in the following chapters, in the face of relative technological deprivation, innovation was often the child of necessity.

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- ² William Eisler, *The Furthest Shore: Images of Terra Australis from the Middle Ages to Captain Cook* (Cambridge, U.K.: Cambridge University Press, 1995), 119.
- ³ Ibid., 127.
- ⁴ Ibid., 128.
- ⁵ Ibid., 151.
- ⁶ Ibid., 83.
- ⁷ T.M. Perry, *The Discovery of Australia: The Charts and Maps of the Navigators and Explorers* (Melbourne: Nelson, 1982), 11.
- ⁸ Ibid., 18-19: plate 7.
- ⁹ Michael Richards and Maura O'Connor, *Changing Coastlines: Putting Australia on the World Map 1493-1993* (Canberra: The National Library of Australia, 1993), 10.
- ¹⁰ Robert Clancy, *The Mapping of Terra Australis* (Macquarie Park, N.S.W: Universal Press, 1975), 75.
- ¹¹ Richards and O'Connor, *Changing Coastlines*, 14.
- ¹² Alexander Turnbull Library, Tapuhi [database online] (The Library, ca1992-), PUBL-0056.
- ¹³ Bernard Smith, *Art as Information: Reflections on the Art from Captain Cook's Voyages* (Sydney: Sydney University Press for the Australian Academy of the Humanities, 1979), 6.
- ¹⁴ F. Bruce Sampson, *Early New Zealand Botanical Art* (Auckland: Reed/Methuen, 1985), 13.
- ¹⁵ Ibid., 25-28.
- ¹⁶ A. Charles Begg & Neil C. Begg, foreword by the Right Hon. the Viscount Cobham, *Dusky Bay*, 2d rev. ed. ([Christchurch]: Whitcombe & Tombs [1966]), foll. 160.
- ¹⁷ Sampson, *Early New Zealand Botanical Art*, 37-41.
- ¹⁸ Eisler, *The Furthest Shore*, 156.
- ¹⁹ Richards and O'Connor, *Changing Coastlines*, 22.
- ²⁰ Sampson, *Early New Zealand Botanical Art*, 4.
- ²¹ Anne Kirker, 'Lithography in New Zealand: A Coming of Age', in Pat Gilmour, ed., *Lasting Impressions: Lithography as Art* (London: Alexandria Press, 1988), 296.
- ²² Carl E. Schorske, *Fin-de-siecle Vienna: Politics and Culture*, 1st ed. (New York: Knopf: distrib. by Random House, 1980), xxi-xxii. Mentioned by Roger Chartier when speaking of directions for work in intellectual and cultural history in *Cultural History: Between Practices and Representations*, translated by Lydia G. Cochrane (Ithaca, N.Y.: Cornell University Press, 1988), 45-47.
- ²³ Guy M. Robinson, Robert J. Loughran and Paul J. Tranter, *Australia and New Zealand: Economy, Society and Environment* (London: Arnold, 2000), 1-2.
- ²⁴ D.H. Borchardt, *Australia* [Spread of Printing Series] (Amsterdam: van Gendt, 1969), 33.
- ²⁵ *Typo*, 1 (November 1887): 81.
- ²⁶ Ibid.
- ²⁷ Petone Settlers Museum Display Information, July 1999.
- ²⁸ W.H. Oliver, 'Reeves, Sinclair and the Social Pattern', in Peter Munz, ed., *The Feel of Truth: Essays in New Zealand and Pacific History*, presented to F.L.W. Wood and J.C. Beaglehole on the occasion of their retirement (Wellington: A.H. & A.W. Reed for the Victoria University of Wellington, 1969), 164.
- ²⁹ 'Departure of the First Four Ships', in *The Weekly Press Jubilee Number 1850-1900* (Christchurch: the Press, 1900), 29-30. (Published to celebrate Canterbury's Jubilee Year.)
- ³⁰ Charles Hursthouse, *New Zealand, or Zealandia, the Britain of the South* (London: Stanford, 1857), 423.
- ³¹ Charles Hursthouse, *New Zealand, or Zealandia, the Britain of the South*. 2nd ed. (1861), 251.
- ³² G.J.R. Linge, 'Manufacturing in New Zealand; Four Years in a Century of Growth', chap. 8 in *Land and Society in New Zealand: Essays in Historical Geography*, ed. by R. F. Watters for the Wellington Branch, New Zealand Geographical Society (Wellington: A. H. & A. W. Reed [1965]), 158.
- ³³ G.H. Scholefield, *Newspapers in New Zealand* (Wellington: A.H. & A.W. Reed, 1958), 3.
- ³⁴ A.H. Johnstone, *Canterbury Books, 1847-1955: A Bibliography* ([Christchurch]: Whitcombe & Tombs Ltd., 1956), entry for 1858.
- ³⁵ Dr. W.B. Sutch, 'An Economic Survey: Position of the Industry', in R.A. McKay, ed., *A History of Printing in New Zealand 1830-1940* (Wellington: R.A. McKay for the Wellington Club of Printing House Craftsmen, 1940), 170.

- ³⁶ R.F. Watters, 'Change and the New Zealand Scene', chap. 10 in *Land and Society in New Zealand: Essays in Historical Geography*, ed. by R. F. Watters for the Wellington Branch, New Zealand Geographical Society (Wellington: A. H. & A. W. Reed [1965]), 189-193.
- ³⁷ *The Southern Monthly Magazine* (Auckland: Creighton and Scales, 1863-1866): 1(1863): 1.
- ³⁸ Tolla Williment, *150 Years of Printing in New Zealand* (Wellington: Government Printing Office, 1985), 31.
- ³⁹ *The Southern Monthly Magazine*, December 1863, 547.
- ⁴⁰ *Ibid.*, 548.
- ⁴¹ *Ibid.*, 552.
- ⁴² 'The Individual Responsibility of Colonists' in the *Southern Monthly Magazine*: August 1863, 310-311.
- ⁴³ Miles Fairburn, *The Ideal Society and its Enemies: The Foundations of Modern New Zealand Society, 1850-1900* (Auckland: Auckland University Press, 1989), 269.
- ⁴⁴ *Ibid.*, 235.
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- ⁴⁶ Claudia Orange, 'The Maori People and the British Crown (1769-1840)', chap. 2 in *The Oxford Illustrated History of New Zealand*, 2nd ed., 37.
- ⁴⁷ Dr. W.B. Sutch, *Poverty and Progress in New Zealand: A Re-assessment*. [2d rev. ed.] (Wellington: Reed, [1969]), chronological table at the end.
- ⁴⁸ Linge, 'Manufacturing in New Zealand; four Years in a Century of Growth', 147.
- ⁴⁹ Space Transformed: Colonial Communications, 1850s to 1890s', in *Bateman New Zealand Historical Atlas = Ko Papatuanukue Takoto Nei*, Malcolm McKinnon, ed. with Barry Bradley and Russell Kirkpatrick (Auckland: D. Bateman in association with Historical Branch, Dept. of Internal Affairs, 1997), plate 52.
- ⁵⁰ W.J. Gardner, 'A Colonial Economy', chap. 3 in *The Oxford History of New Zealand*, 2nd ed., 76.
- ⁵¹ *Typo*, 6 (July 1892): 52.
- ⁵² Alan H. Grey, *Aotearoa & New Zealand: A Historical Geography* (Christchurch: Canterbury University, 1994), 363.
- ⁵³ R.F. Watters, 'Change and the New Zealand Scene', 192-193.
- ⁵⁴ Grey, *Aotearoa & New Zealand*, 151.
- ⁵⁵ Sutch, 'An Economic Survey: Position of the Industry', 169.
- ⁵⁶ White, John, *Journal of a Voyage to New South Wales* (London: J. Debrett, 1790).
- ⁵⁷ Roger Butler, 'Lithography in Australia: Melbourne 1948-1958', chap. 8 in Gilmour, ed., *Lasting Impressions*, 283.
- ⁵⁸ Thomas Alwynne Darragh, *The Establishment and Development of Engraving and Lithography in Melbourne to the Time of the Gold Rush* ([Thumb Creek, N.S.W.]: Garravambi [Press], 1990), 7.
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- ⁶⁰ *Ibid.*, 7.
- ⁶¹ [Ron Radford], 'Prints of the Late 18th and 19th Century' in *Outlines of Australian Printmaking: Prints of Australia from the Last Third of the 18th Century, Until the Present Time* ([Ballarat, Vic.]: Ballarat Fine Art Gallery, [1976]), [1].
- ⁶² Darragh, *The Establishment and Development of Engraving and Lithography in Melbourne to the Time of the Gold Rush*, 14.
- ⁶³ J.E. Traue, 'The Two Histories of the Book in New Zealand', in *BSANZ Bulletin Special Issue*, 25 no.1&2 (2001): 8.
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- ⁶⁵ P.A. Griffith, Ross Harvey and Keith Maslen, eds., *Book & Print in New Zealand: A Guide to Print Culture in Aotearoa* (Wellington: Victoria University Press, 1997), 22.
- ⁶⁶ A.G. Bagnall, ed., *New Zealand National Bibliography to the Year 1960*, 5 vols. in 6 (Wellington: Government Printer, 1969-1985), vol.1, pt.1, facing 128.
- ⁶⁷ Mr. A.W. Reed, 'Thoughts on the History of the Printing and Publishing of Books in New Zealand', in *New Zealand Libraries*, 4 (January 1941): 62.
- ⁶⁸ *Historical Notes From the Bedplate Press Printing Museum* (Silverstream, Wellington: The Bedplate Press Printing Museum Inc., n.d.), no1, [1].
- ⁶⁹ A.H. McLintock, ed., *A Descriptive Atlas of New Zealand*, 2nd printing (Wellington: Government Printer, 1960), 5.
- ⁷⁰ Robert W. Kenny, ed., *The New Zealand Journal 1842-1844 of John B. Williams of Salem, Massachusetts*, with an account of his life by Robert W. Kenny ([Providence, R.I.]: Brown University Press, 1956), 5.

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- ⁷³ R.A. McKay, ed., *A History of Printing in New Zealand 1830-1940* (Wellington: R.A. McKay for the Wellington Club of Printing House Craftsmen, 1940), 80.
- ⁷⁴ Roderick Cave & K.A. Coleridge, 'For Gospel and Wool Trade: Early Printing in New Zealand', in *Printing History*, 13 (1985): 20.
- ⁷⁵ Kirker, 'Lithography in New Zealand: A Coming of Age', 296.
- ⁷⁶ J. Degotardi, *The Art of Printing in its Various Branches: With Specimens and Illustrations* (1861; facsim., Sydney: the Officina Boronia, 1982), 16.
- ⁷⁷ Traue, 'The Two Histories of the Book in New Zealand', 14.
- ⁷⁸ Williment, *150 Years of Printing in New Zealand*, 24.
- ⁷⁹ Charlotte Godley, *Letters from Early New Zealand, 1850-1853*, ed., with notes, by John R. Godley (Christchurch: Whitcombe & Tombs, 1951), 37 and 80-81.
- Note: Charlotte Godley was on the way to Canterbury with her family where her husband John was to supervise the establishment of the settlement.
- ⁸⁰ David Novitz and Bill Willmott, eds., *Culture and Identity in New Zealand* ([Wellington]: GP Books, c1989), 282-284.
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- ⁸² H. Snowden Ward, 'Trade Journals and Process Mongers', in *The Process Year Book for 1996*, 2 (1896): 109. (H. Snowden Ward was editor of the *Process Photogram*, and was writing by invitation of the *Process Year Book* editor.)
- ⁸³ *Typo: A Monthly Newspaper and Literary Review Devoted to the Advancement of the Typographic Art and the Interests of the Printing, Publishing, Bookselling, Stationery and Kindred Trades* (Napier: R. Coupland Harding, 1887-1897): 5 (June 1891): 103.
- ⁸⁴ *Typo*, 1 (January 1887): 1. Note: Printed in Wellington from 4 no.43 (1890).
- ⁸⁵ Ward, 'Trade Journals and Process Mongers', 110.
- ⁸⁶ McKay, ed., *A History of Printing in New Zealand 1830-1940*, 105.
- ⁸⁷ See letter quoted in chapter 7 in section, 'Robert Coupland Harding', W.H. Foden to Robert Coupland Harding'; end-note 185.
- ⁸⁸ *Typo*, 2 (1888): 66.
- ⁸⁹ *Typo*, 1 (February, 1887): 10.
- ⁹⁰ *Typo*, 4 (May 1890): 57.
- ⁹¹ *Typo*, 4 (January 1890): 11.
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- ⁹³ *Typo*, 1 (February 1887): 10. Other statistics salient to the printing industry are also given here.
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- ⁹⁶ A.H. McLintock, ed., *An Encyclopaedia of New Zealand*, (Wellington: Government Printer, 1966), vol. 2, 871.
- ⁹⁷ *Typo*: 1 (January 1887): 4.
- ⁹⁸ *Typo*: 1 (July 1887): 55.
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- ¹⁰¹ *Ibid.*, 57.

SECTION II

Colour Printing Reaches New Zealand

CHAPTER 4

EARLY COLOUR PRINTING IN AUSTRALIA AND NEW ZEALAND: A BRITISH INHERITANCE

In *Book & Print in New Zealand* it has been said that “the technology of printing had to be imported into New Zealand accompanied by the skilled operators”¹ and that research into print material production should accord particular attention to the initial establishment of technologies used.² (Literature Review: 28.) The fact that New Zealand printers had in the first instance inherited a largely British print culture prompts important questions. What had been the state of the art of colour printing in the Old World at the time of the departure of the emigrants to Australia and New Zealand, and how did subsequent development, now in two hemispheres, compare and perhaps diverge? For a study of New Zealand colour printing development and practice in the Australasian setting, it is important to bear in mind the relevant technical factors that came from the Old World, to help account for both the technological inheritance and any local individuality that may be discerned. As background for a comparison with New Zealand colour printing, developments in British colour printing have therefore been outlined in volume 2. Because the separation from the parent print culture was incomplete owing to the ability for continued communication both in person and in print, the relevant technical environment relates not only to the time the colonists first brought printing with them to Australasia, but also to the environment after separation.

The technological theme is central to the model developed for the study and will now be explored. Chapter 4 will outline some aspects of Australasian colonial colour printing development up to the time of the establishment of chromolithography in New Zealand. Because relatively close links existed between Australia and New Zealand in the nineteenth century, an Australasian viewpoint is appropriate here. In section III, Chapter 5 will explore the technological theme further, focusing on some of the Australasian innovators of significance to colour printing in the study period, and Chapter 6 will look at the photomechanical revolution as it related to colour printing in New Zealand.

The Transmission of Colour Printing to Australasia

Early Colonial Print Production and the Graphic Arts in the Antipodes

The first printing press to be brought to Australia sailed with the first fleet in 1788, but due to the lack of printing expertise, on arrival it had lain idle until the “probably self-taught” George Hughes had used it to make some amateurish efforts at letterpress printing in 1796.³ A few years later, to meet official needs, George Howe had printed the first Australian book in 1802. Howe, born in the West Indies where he had first learnt the printing trade, had later worked in London newspaper offices before being transported to Australia. In the following year, he had also accomplished the printing for the first official newspaper. As noted by Wallace Kirsop, this established a pattern that endured in New South Wales and Van Dieman’s Land into the 1820s, in which against such official work, a little commercial printing had been accomplished on the side, but where normally, for major publications concerning Australia, printing had been repatriated.⁴

As mentioned in chapter 3, Sir Thomas Brisbane had brought the first lithographic press to Australia in 1821. After his departure from Sydney the government had signalled an interest in lithographic printing, such an official move beginning to set the stage for lithography to become an important process for colonial image replication and printmaking. This became the case not only in New South Wales, but also in Tasmania, Western Australia, South Australia and Victoria, where lithographic presses had begun operation in the capital city of each of these states over the period 1833 (in Hobart) to 1852 (in Perth). Furthermore, once thus established, lithography was to continue as “the preferred graphic arts process in Australia for the next half century.”⁵ Thomas Darragh has said that in Melbourne the beginnings of both engraving and lithography had followed soon after the establishment in 1838 of letterpress printing there three years after settlement in 1835.⁶ Melbourne’s earliest surviving lithographic prints were produced by Henry Lingham as illustrations for the early periodical the *Port Phillip Magazine* which began in January 1843.⁷ Lingham had trained in London at Darton and Clark. Women such as Mary Morton Allport in Hobart in the forties, and later Elizabeth Parsons in Melbourne were also among the early Australian lithographers.⁸

Continuing Australasian Connections with the Parent Print Culture

After 1850, the trend towards the use of lithography in Australia was also reinforced by the arrival of immigrants with lithographic experience, an increase in migration around this time being due especially to the gold rushes which began in 1853, when the demand for a variety of commercially printed images began to increase. Thomas Darragh has said that the gold rush in Victoria, “responsible for the influx of a host of engravers and lithographers

from Great Britain and Europe, totally [changed] the face of the trade in Melbourne.”⁹ This was the time when the demand for the visual had begun to be met, especially through the provision of illustrations in newspapers and magazines.

Many of the Australian practitioners of the lithographic art had enjoyed close contact with European developments in lithography before emigrating, and some had worked with a famous colour printer, for instance, Tasmania’s Thomas Bluett, who had trained with Day and Haghe in London. Others had published books on the subject, for instance, Joseph Aresti, who had been actively involved in the art of colour printing between 1840 and 1860. J. Aresti’s *Lithozôgraphia; or, The New Art of Obtaining Aqua-tinto Effects Upon Painted or Washed Drawings on Stone* was brought out in a second edition in London in 1857. Edward La Trobe Bateman had worked on the lithography for three of Owen Jones’s publications in London before embarking for Australia: the title *Flowers and their Kindred Thoughts* had been produced in 1848, *Fruits from the Garden and Field* in 1850, and *Winged Thoughts* by Mary Ann Bacon, designed by Owen Jones and lithographed by E.L. Bateman, had been published in 1851.¹⁰

First Printed Colour in Australia

The first known appearance of printed colour in lithographed art prints in Australia was in the early eighteen forties, almost two decades after the first local lithographs had been made. As had applied in the northern hemisphere, where, in the hands of many artists, colour by way of tint stones had often preceded chromolithography, tinted prints had appeared as forerunners to fully colour-printed images. John Skinner Prout, nephew of the English painter Samuel Prout who helped to popularize picturesque landscape, was making lithographs locally from 1842 for *Sydney Illustrated*. These lithographs were printed from the press in two shades of sepia, although a more expensive hand-coloured edition had also been available.¹¹ Roger Butler has stated that for *Sydney Illustrated*, “the lithographs were printed by Thomas Bluett,”¹² and that later, John Skinner Prout was “credited with the first lithograph printed in colour in Australia” in 1845, although the first true chromolithographs had not appeared until 1864.¹³

Rated as one of only two artists of better than average talent to have arrived in Sydney, the reason for Prout’s emigration to Australia is not clear, as due to economic depression at the time, this was not a period in which art was flourishing in the colonies. However Prout had toured New South Wales, as well as Tasmania, publishing many lithographs printed in tints, an example being *Rest Down on the Derwent, V.D.L.* in *Tasmania Illustrated* which was

published in Hobart from 1844. Some of Prout's lithographs were also produced as single prints, such as *The Wellington Falls, Hobart Town*, which, printed in tints, was issued in 1845. Prout also taught art and is said to have engendered much enthusiasm for drawing and watercolour, causing a rush on supplies from the stationers' shops. Further images of Australia were produced in Prout's *Views of Melbourne and Geelong*, and after his return to England, he found himself to be sought after by publishers to provide illustrations for books on Australia. The demand for these was being driven by the upsurge of interest in the southern colonies especially later in the wake of gold fever.¹⁴

Printed Items As Clues to Early Australasian Colour Printing Practice: The 4d Lithograph

Because of the fact that those everyday printed items, postage stamps, have become collectors' items and are the subjects of very close examination by philatelists, some interesting information as to the colour printing techniques, and also the circumstances in which the printing was carried out, has sometimes come to light. Such a case occurred when in 1867, flaws were noticed in an Australian stamp now known as the 4d lithograph. In Australia, the first postage stamps, for the values 1d, 2d, and 3d, had been issued in January 1850. Featuring the colony's seal, the 1d was in terracotta with white textual elements, and the 3d was a light grey-blue with the textual elements in a darker shade of grey-blue-green.¹⁵ The 4d lithograph, one that is considered by philatelists to be very handsome,¹⁶ depicts the image of that Western Australian symbol, the black swan, printed on a blue-grey ground bordered with white lettering in an octagonal frame, and had originally been printed at the Surveyor General's Department in Perth between 1854 and 1855. Since a flaw in a postage stamp greatly increases its value to collectors, much interest in this stamp was aroused amongst philatelists because flaws were noticed in some stamps. These discoveries led on to the close examination of the lithographic printing used to print the stamps, in order to explain the presence of such flaws.

From the nature of the flaws, Brian Pope has traced historical events, and has given an account of the probable printing procedures that caused them in *Western Australia: The 4d Lithograph, 1854-1864*. In the fifties, postage stamp printing in Western Australia was in its infancy, as is shown by the fact that, in June 1852, after the Legislative Council had decided to introduce reduced rates of postage, making the issue of new stamps necessary, the Governor, no doubt anxious to begin to effect the changes as soon as possible, sent advice to the Colonial Office in London. A quotation from the letter stated one of his requests:

With the view of enabling me to carry out this measure in the most simple way, I have to request the Colonial Agent may be instructed to forward to this Colony one Million of Penny Postage stamps the device of which I would suggest should be a black swan upon a colored ground...¹⁷

It was after this that the saga of the lithographic printing of the 4d stamp, set out in detail by Pope, had begun. It appears that the new postal rates had already been in force since July of 1852, and that a new 6d rate was also projected, but because of the realization of the time that would be taken to effect this change, a compromise was made, and it was decided to instead produce a 4d value stamp which would be printed in Perth. In September 1853, the following items were despatched to Australia: "a 1d engraved steel plate, 17 reams of Swan watermark paper, a printing press and associated items, together with 1,000,000 1d stamps."¹⁸ At this point colonial improvisation played a part: it was decided that a 4d stamp could be printed using the 1d plate, with judicious alterations. The instruction was to make the centre of the new stamp the same as the 1d, and to insert the price in the border which was to be altered to an octagonal shape. However, the problem was that all the paid time of the lithographers was occupied with work for the government in lithographing such items as forms and circulars, so that any other work, for instance maps, plans and stamps, had to be printed after hours. Thus it came about that, through the lithographers working extra hours in difficult conditions, the production of the 4d stamps began, with the help of the 1d plate supplied from where it had been kept at the Treasury.

Pope has shown that due to the complicated procedure which was carried out in less than ideal circumstances, various errors crept in that have shown up as variations, such as lines, dashes and slight tilts in the printed stamps, these imperfect stamps later becoming sought-after rarities. The sequence of events has revealed how the biggest blunder of all was caused. This mistake, the source of the rarest of the 4d lithographs, resulted in some of the 4d stamps being printed with the frame upside down, so that the printing in the borders also appeared printed upside-down. It has come to light that after only the first printing in July 1854 of 100 sheets of the stamps, the draughtsman, Horace Samson, who was superintending the lithography, resigned. Pope has proved that after Samson had resigned, it was during the next printing, in January 1855, that the major error must have occurred—Hillman was the lithographer in charge by then, and had apparently made a new transfer, perhaps due to some damage to the intermediate stone, and in transferring from the original he must have laid it upside down, "thereby producing one of the greatest philatelic errors of all time."¹⁹

The study of these philatelic rarities has shed light on their printing, as the varying shades of the blue-grey background have been an instrumental factor in unravelling the history of their printing. In the early experimental period of colonial lithographic colour printing, colour control was far from perfect: the variations in the 4d lithographs exemplify the

difficulties experienced in repeating exact shades of a colour for several printings as was required here. As far back as 1867, it was recognised that the 4d lithographs, which appeared in three basic shade groups ranging from “a deep dull blue, a slate blue and a wide range of blue from deep to pale,”²⁰ reflected such problems. There was much variation in the background shade even within a sheet: Pope comments that the use of the local blackboy gum on the back of the stamps has affected the colours as well. In 1925, the state of the colouring in one sheet of the stamps was described by a collector:

There was a pronounced wave of varying colour, the best shade being at the top left hand corner with a weakening in density to the bottom right hand corner. From the top you could get sharply executed and coloured specimens and at the bottom weak in colour and impression.²¹

As it turns out the varying colours were helpful in fixing the successive dates in the stamps’ printing history. Other imperfections that have been uncovered by the nature of other flaws such as creases have been explained “by the uneven operation of the scraper as the stone and the transfer paper go through the press.”²² In this case the early use of coloured lithography for stamp printing has pointed up colour control difficulties inherent in the process that was the most widely used in colonial Australasia for all kinds of graphics printing, and is indicative of the reasons that close contact was necessarily kept with the centres of Old World printing where, in the richer technical and artistic environment, research leading to development and improvement was more likely to occur, producing innovations that would in time be transmitted also to the southern lands.

Two Early 19th Century Sydney Firms Executing Graphics Printing

Experiences of the Sydney firms of Penfold & Co. and Johann Degotardi, both of which were engaged in graphics printing in the early years of the study period, serve to further illustrate some of the background factors influencing Australasian printing in this domain, including those affecting early colour printing around the time of its New Zealand beginnings, when frequent trans-Tasman interchange was a factor likely to impinge on New Zealand printing practice.

Penfolds

W.C. Penfold & Co. was an early Australasian printing firm that was founded in Sydney in 1830 by William Moffitt, a bookseller, printer and engraver who set up to print a variety of items that were needed by the colonial society, including engraved billheads, ornate business cards, labels, invoices, share certificates and promissory notes. The lack of nearby manufacturing centres meant that there were shortages of even basic supplies such as paper, and that essential printing equipment such as type, ink and a suitable press to fit the job at hand was difficult to obtain. Such a situation was soon to be repeated in New Zealand. The

appearance of colour in Penfolds' print products was, for the printer, sometimes not a matter of choice. History recounts that in the face of paper shortages, an appeal to the public for paper was not an uncommon last resort, but that the vexing results of such an appeal were print products of unavoidable colours:

We have had repeatedly to lament the necessity of vying with the chameleon its change of colour...To necessity we cannot dictate... We hope, nevertheless, ... still to prosecute our labours until relenting fate shall put an end to our vicissitudes.²³

Penfolds stocked a varied assortment of reading matter—from schoolbooks and magazines to special shipments of imported Italian and French books. In this way the firm was typical of early colonial printing houses, in that, to underpin other activities, bookselling was economically integral to the business. However, from the start Penfold's business was chiefly in publishing and engraving. Many of the copperplates engraved at Penfolds in the early days have survived, making evident the high-class work accomplished there, inspite of the challenging cultural and business conditions experienced.

Johann Degotardi of Sydney

1860 was the year in which Burke and Wills set out from Melbourne to cross Australia from south to north. Just after this, at around the same time Ward and Reeves were introducing the process of chromolithography into Canterbury in New Zealand, the first chromolithographs to be published in Australia as a collection, *Album of Chromo Lithographs* by Nicholas Chevalier, came off the press in Melbourne. This album appeared in parts between 1864 and 1865. Butler has commented that at the time, the Australian understanding of chromolithographs was that they were confined to being "reproductions of oil paintings, printed from numerous stones often with a final oil varnish and applied texture."²⁴

However, by the early sixties, it was evident that the process of chromolithography was being used for various purposes by the Sydney printer Johann Degotardi, who was working to adapt his capabilities to the local colonial market conditions. Degotardi was both the author and publisher of the first work that was published in Australia on the subject of printing, *The Art of Printing in its Various Branches: with Specimens and Illustrations*, which appeared in Sydney in 1861.²⁵ Johann Degotardi, an engraver and lithographer, had migrated to Australia from Slovenia at the height of the gold-rush era in 1853. By 1855 he had set up a printing business, the Sydney Printing House, from where he had undertaken printing of every description. It is known that he had regular correspondence with Alois von Auer in Vienna,²⁶ and was familiar with the Imperial Printing Institute which he described as a "vast establishment" employing about 1000 people in all its branches, with "50 iron

presses for book-work, 40 lithographic and 24 copper-plate presses, 50 printing-machines, and two for lithography...10 cameras with 40 copying-presses for photography.”²⁷

Degotardi intended *The Art of Printing* to be a vehicle to explain and showcase his skill as a printer, and it was for this work that he produced many samples of printing on a variety of papers to tempt the local market towards the greater employment of his skills as a colour printer. The uses of shading, photolithographic reduction and colour printing, especially the the art of chromolithography, were all explained with actual examples included to demonstrate the effects to be had from the application of various coloured inks, including gold. In providing examples of the many facets of his printing accomplishments, Degotardi was able to suggest to his clients how they might employ his services. In this work, which was itself originally encased in bright green coated paper wrappers printed in gold, descriptions of the many colour printing processes he was able to provide also gives insight into colour printing information disseminated to the Australasian printing trade just as colour printing was on the brink of an appearance across the Tasman in some New Zealand printeries.

In his section on Chemical Impressions, Degotardi vigorously promoted the usefulness of lithography, giving prominence to its capability of a wide application to the production of colour, as well as to the economies it offered:

Next to letter-press printing this is the most generally useful as well as the cheapest method, not only for commercial, but also for artistic purposes, exemplified in its celerity of execution and its marvellous capability of reproducing autograph letters, pen-and-ink drawings, flowers of the brightest hue, the chromatic shades of the butterfly, landscapes, shells, maps, monuments, architecture, the various shapes and appearances of contagious diseases, anatomical sections, copies of oil and watercolour paintings of the greatest masters, in fact, of anything on the face of the globe, in nature and art. This invention, if skilfully executed, may be truly designated the language of nature for the thousandfold reproductions in art of her original colours and peculiarities.²⁸

In his description of nature printing, Degotardi explains how the colour is applied, saying that when the printing plate is ready, “the different colours are given to it by putting the various inks on the plate at once, the latter reproducing the colours at one impression.”²⁹ In fact his descriptions are very thorough, giving his readers an overview of many branches of the printer’s art. Colour printing in relation to letterpress printing and the production of illustrations from wood engraving is also covered.

In Colour-printing, each colour is worked separately, and the greatest care and exactness is required on the part of the pressman in order to obtain cleanliness of colour and accuracy of registration in the different shades, the requisite colour being adapted to the right place by means of points, leaving only that part exposed to the roller which is necessary to receive each particular colour.³⁰

To preface a facsimile copy of *The Art of Printing* which is not in colour, Jürgen Wegner has written notes on the colour printing of the title page as it appeared in the original,

describing it as being “printed in a variety of typefaces and coloured inks – borders in blue; lines 2, 7 and 9 in red; 4 and 8 in green... Printed on a lightweight highly calendered laid paper...”³¹ A supplementary section at the back of *The Art of Printing* contained the actual examples of Degotardi’s printing, although the facsimile copies are not in colour. The originals, which I have not viewed, but which are described by Wegner, included a copper-engraved billhead on watermarked laid paper, specimens of engraved visiting cards on white coated paper, an engraved music score, a lithographic circular on wove paper and a chromolithographed wine label finely printed in gold and green with black. Further examples were to demonstrate the results of the anastatic process and zincography on wove paper. Another example was of a map photolithographically reduced ninefold, which in the original had folded out to provide a double page spread. A sample showing Degotardi’s process of photolithographic printing from stone in which captions were printed in brown ink on wove paper with an illustration printed in brown ink on white paper pasted onto a book page has also been included. The last example is of nature printing with a heading printed in brown ink on wove paper, and a fern inked and printed in dark green with the stem and description in brown. This last example was printed on tissue paper that has been pasted onto a book page.³²

Degotardi was one of Australia’s very early colour printers, as well as a pioneer in other colonial printing processes. In the section of his treatise devoted specifically to chromolithographic colour printing, he gave a detailed account of the process he used, in which the black impression was the last:

The first necessity in this branch of the art is a key-stone, or a complete outline of the intended drawing, taken usually in black; from this as many impressions are transferred as there are colours required; if, for instance, the drawing contains six colours, five transfers are made for the outline, for the purpose of filling in the colours, each stone bearing only that portion of the drawing that requires the particular shade. Each colour, therefore, has its own drawing and nothing else, and when the printing commences, the black ink drawing is washed out with turpentine; this leaves only the light grease on the stone, and all the requisite copies are then worked off in that one colour; if gold, the writing is usually printed with a brown ink and afterwards dusted with a gold bronze: in printing the second and all the following stones, two holes have to be pricked in each sheet of paper or card, these correspond with all the other stones, and by means of needles are put on the corresponding position on the stone, so as to fall in exactly the right places: the last impression is from the black stone, called, as it gives the entire finish with the outlines, the keystone. The process of zincography is almost the same, the only alterations being the use of zinc plates for stone, a few different chemicals for etching, and the capability for printing from copper-plate as well as from the lithographic presses. A good lithograph printer will print 500 to 800 impressions per day.³³

Degotardi, who was also a photographer, became known as “the founder of a photographic dynasty,”³⁴ and in Australia was instrumental in the early promotion of the photolithographic processes that were to become an important basis for many of the later colour printing methods. Of the process of photolithography, which he described as “the latest invention, not yet made public”³⁵ Degotardi had this to say:

For commercial purposes, no branch of the art can be of greater value, as it diminishes the expense of drawing and engraving, and at once supplies copies of plans, maps or any other objects in nature which are reproduced with the most astonishing accuracy....photography is available only to a comparatively small class of persons, whereas, in consequence of the rapidity and cheapness of its re-production when once on stone, photolithography will be essentially the art for the million.³⁶

Soon after this statement, around 1863, an example of a published map photolithographed by Degotardi appeared. It is listed in R.V. Tooley's carto-bibliography as the sheet 'New South Wales and Part of Queensland Shewing the Relative Positions of the Pastoral Runs, Squattages, Districts Counties Towns Reserves &c.' The preliminary photolithographic work was carried out for the Sydney firm of F.H. Reuss & J.L. Browne, Surveyors & Architects, who compiled, drew and published the map.³⁷ By 1866 photolithography was also in use officially in the Surveyor General's Office in Melbourne. J. Noone is named as the photolithographer for the 'Gazetteer Map of New South Wales' published in Bailliere's *New South Wales Gazetteer* that year from that office, it being recorded on the map that the photolithography was undertaken from the original map "by permission of W.R. Davidson, Esqre, Surveyor General, New South Wales."³⁸ It was also Mr. Noone who was the adviser to the New Zealand Government on the appointment of the first photolithographer to the New Zealand Government Printing Office a little later, in the early seventies. (See chapter 5.)

The Importance of Maps in Early Australian Print Culture

R.V. Tooley has observed that the maps of the early Australian colonial period were generally not appealing in the decorative sense, and this has partly contributed to the fact that research in this area has remained relatively neglected until recently. The need to document the marine environment for the benefit of shipping, and the topography and geology of newly explored lands, mainly for commercial purposes, had led to a great deal of map creation in manuscript form at the local level. Some of these were later converted to printed form. Many of these early Australian manuscript maps were made in situ for purposes that were specific to their locality, for instance the charts that had been created in connection with the early river-boat transportation that plied the important Murray River.

Most boats carried charts made by their captains in ink on calico eighteen inches wide wound onto rollers for different stretches of the river. Some were up to one hundred feet long and recorded snags, reefs, sandbars, trees, buildings and places....these charts were a skipper's most carefully guarded possession and went with him from boat to boat.³⁹

Useful local detail was included, for example, landmarks and hazards, such as the position of previously sunken boats.

Before the study period, many of the later published maps and plans from early Australian colonial times had been printed in Britain, a very early example being the 'Sketch of

Sydney Cove, Port Jackson, in the County of Cumberland, New South Wales, July 1788' which was published 1789 by J. Stockdale of London from an engraved copperplate. This map appeared in *The Voyage of Governor Phillip to Botany Bay; With an Account of the Establishment of the Colonies of Port Jackson and Norfolk Island*, the copy held by the Mitchell Library in New South Wales being hand-coloured as was usual at the time.⁴⁰ The imprint of such well-known English firms as Arrowsmith, Charles Knight, Joseph Cross, W. Nicol, and Day and Son often appear on early maps of the Antipodean colonies, one example being the 1826 'Chart of Van Dieman's Land Compiled From the Most Authentic Documents Extant', which was engraved, coloured and published by Joseph Cross of London. This map contained the note "the parts coloured green shew the land already granted to various persons from 30 acres to 7000 each grant."⁴¹

After European settlement the emphasis in Australia was on coastal mapping. Information gathered was used to update past maps, for instance, in the 1820s the Hydrographic Office of the Admiralty was able to update the charts of Flinders using such data. This period of information gathering culminated in the publication in Britain of the first volume of *The Australia Directory* in 1830. In fact it was not until the twentieth century, in 1921, that the Royal Australian Naval Surveying Service was founded, holding responsibility for surveys only from that time. Since World War II this body also assumed responsibility for the publication of the nautical charts of Australia.⁴² However, in the first part of the nineteenth century, as colonial publishing began to gather ground, some local printers and publishers branched out, attempting such formats as maps.

Colour for Maps in Sydney and Melbourne

The first map to be published in Australia appeared in 1832 in the directory *The New South Wales Calendar and General Post Office Directory*, simply entitled 'Map of the Town of Sydney'. Following established northern hemisphere tradition, this map is hand-coloured.⁴³ As a useful informational feature, colour was also employed in the lithographed 1837 map 'Plan of Sydney with Pyrmont, New South Wales: The Latter the Property of Edw.d Macarthur Esq.re Divided into Allotments for Building, 1836'. In the margin of this map "Select Committee on Transportation-1837" appears, although the year has been altered in ink to (183)6.⁴⁴ J. Basire was the lithographer but place of production is not stated. A note printed on the map explains the colouring employed to distinguish various features:

The part tinted Brown shews the ground reclaimable from the Sea.

Green, is proposed to be reserved.

Yellow, shews what is proposed as a reserve for Fortification.

Pink, as a site for a Church.

Blue, is reserved for a Wharf.⁴⁵

As settlement progressed the land surveyors and explorers often became map-makers, creating the first maps of inland Australia, many of which were published to illustrate explorers' journals, proceedings of the Royal Geographical Society or Parliamentary reports, while some were made available as separate maps. From 1828 onwards, using lithographic techniques, the Surveyor-General's Office had produced county and parish plans of various scales, these documents being updated by successive government printers right into the twentieth century. By the 1850s more maps were being produced in the colonies, Johann Degotardi, being one of the local printers capable of map production in Sydney. However, specialisation in map publishing was generally not a viable option for early colonial printers in Australia, as most maps and atlases pertaining to Australia in this period were published overseas.

As reported by Thomas Darragh (see chapter 2: 59) a few pioneer map publishers managed to make a living in the larger centres, Thomas Ham⁴⁶ and Frederick Proeschel being two such early firms in Melbourne, where a significant photolithographic innovation that was to underpin later colour printing processes in the field of map printing were to be pioneered by the late fifties. Darragh states that Thomas Ham, who had trained at Tolley's in Birmingham, had arrived in Melbourne in 1842. After setting up his pioneering Melbourne engraving business in the following year, he had accepted miscellaneous work, becoming the dominant Melbourne engraver of the forties. By 1844 he had also advertised as a lithographer prepared to print artists' sketches as lithographic views. Early work had included sketches of Melbourne buildings that had been issued to local newspaper subscribers; as well as George Gilbert's publications, *An Australian Drawing Book* (1844) and *Australia Felix Illustrated*, a series of prints, the first of which was issued in July 1845. Between 1849 and 1850 Ham had also engraved and lithographically printed the first issue of Victorian postage stamps by transfer methods, but he was chiefly known for the maps that he engraved, printed and published—in Melbourne between 1847 and 1854, and in Queensland later in the sixties. Darragh has said that his most popular map, the 1847 squatting 'Map of Australia Felix', which later went through many editions, had also been his first.⁴⁷

The Frenchman Frederick Proeschel arrived in Melbourne via America in 1852, establishing himself in business by 1853. In the 1992 article 'Frederick Proeschel, Colonial Mapmaker', Thomas Darragh has made a listing of the maps he produced during his time in Melbourne, observing that Proeschel appears to have relied for his livelihood on map publishing alone

until 1864, and that “for this reason...[he] occupies a unique position in Victorian and probably Australian cartography.”⁴⁸ Although trained as an upholsterer, Proeschel had seen that there was a need for maps in the colony, and, perceiving the business opportunity, had set about providing maps to meet that need, his first map, ‘Pocket Map of the Roads to all the Mines in Victoria’ coming off the press in 1853. It had been offered at a variety of prices according to format, options including a choice of paper or calico (for travellers), with a varnished copy being a little dearer. The map was available as a wall map and also as “forming the first sheet of the atlas of Victoria Directory Maps”. Proeschel the astute businessman was quick to actively market his whole range to the government, in this way endeavouring to sow the seed for future sales. Because most of the maps of the period were hand-coloured it is probable that some differences in his price-list are explicable as being the difference in price between coloured and uncoloured versions.⁴⁹

Proeschel had provided maps of Melbourne and other Victorian towns, and then turned his attention to maps of Victoria, his 1856 map ‘Commercial & Agricultural Map of Victoria’ being lithographed by his own firm rather than printed by an outside professional lithographer, as had been his previous practice. Again Proeschel used his initiative to market the map in three guises, this time employing colour in an inventive way: “a general map with just the county boundaries coloured; a goldfields map with the boundaries of the jurisdiction of the wardens indicated; and an electoral map showing the six electoral provinces for the upper house and the 37 districts for the lower house.”⁵⁰ The price list for these maps, coloured and mounted on a roller, consisted of a graduated scale showing increasing discount as the numbers purchased increased. By this time an advertisement for Proeschel’s firm declared “all kinds of Engravings and Lithography executed.”⁵¹

Always looking to improve his maps, Proeschel appreciated that the clever use of colour was a fruitful route to map enhancement, and apparently had gathered ideas accordingly. After one visit to the Surveyor General’s Office, Proeschel had written with a request, saying:

The map you had the kindness to show me in your office, upon which is indicated by colours, the quality of the different soils in Victoria, is of such an interesting nature for the public, that I would feel very much obliged if you would have the kindness to allow me to take a copy of its colours on one of my maps...

The response, according to a minute from Charles Ligar, the Surveyor General was, alas, in the negative: “Inform him that he cannot be allowed to copy the particular map referred to.”⁵²

Darragh mentioned that the standard of Proeschel's maps was considered high; reviews that were published in the local newspapers were nearly always favourable, and there were few criticisms as to their accuracy. In 1856, Proeschel had received a silver medal at the Victoria Industrial Society's Exhibition for an engraved map of Victoria. As Proeschel's list of published maps gradually widened, maps of New South Wales and South Australia had also begun to be included. A new engraved map of Victoria, published in 1859, and printed by lithographic transfer to preserve the original plates, included statistics and illustrative vignettes that were intended to be especially useful to the traveller. The map engraving in this case had been entrusted to John Grieve while the vignettes were by David Tulloch who was a picture engraver. The *Argus* reviewer reported that "the engraving is good and the colouring neat and distinct...in dimensions and general appearance it is one of the most compact and useful maps of Victoria we have seen."⁵³ In another edition of this map, a key to reference the colours used for the mining districts had been added. With respect to a later published revised edition, the *Argus* review notice had again been favourable in praising the standard of engraving and colouring, mentioning that "among other useful matters is the colouring red of all roads travelled by mail coaches."⁵⁴

At a time when there had been few official general maps available, the Surveyor General's Office being mainly focussed on the production of small land-sale plans, Proeschel's maps, by this time amounting to about 30,000 in circulation, had filled a gap. By combining expertise with awareness of need this printer had found a niche market for locally printed maps. To print the maps, Proeschel had often employed professional Melbourne lithographers, such as J.B. Philp, Campbell & Fergusson, and Hamel & Locher. Later, Proeschel had engaged the firm of Brown and Slight as printers, drawing on their long experience of map-printing for Survey Office issues for such series as the Geological Survey, the Geodetic Survey, the Hydrographic Survey and others. Judging the 1861 map of Melbourne as perhaps Proeschel's best, Darragh has attributed its high standard to the fact that "he was using two of Victoria's most experienced and talented map engravers to engrave and print it, [so that] the map possesses all the sophistication and quality found on the large-scale maps entrusted to them."⁵⁵ The *Argus* had noted that the new map, engraved by Brown and Slight, was both clearly printed and well-coloured.

It is evident that because colour in maps was both useful and desirable, from an economic point of view the achievement of the ability for its routine addition via the press was seen to be an advantageous development. The first colour printed geological maps of the Melbourne area were produced as a consequence of the establishment of the Geological

Survey of Victoria under Alfred Selwyn in 1852, the history of which has also been traced by Thomas Darragh. Quoting E.W. Skeats who said that “this Survey laid the foundations of detailed and accurate geological mapping in Australia”,⁵⁶ Darragh added that the Survey was the best in Australia, possessing not only distinguished field staff but also “highly skilled draughtsmen, and printers responsible for the fine series of geological maps issued by the Department during the nineteenth century”, and where both compilation and lithography could be accomplished.⁵⁷ However, an initial problem had centered around the achievement of map colouring in an economic manner.

At first, Selwyn had favoured the British system, whereby the teams of women and children typically hand-coloured the intaglio printed maps. However, finding that because of a shortage of the requisite female labour, “such colouring was prohibitively expensive in Victoria in the mid-1850s where it cost not less than 2/6 per sheet,”⁵⁸ around double the cost in Britain, the solution appeared to lie in the lithographic arts, although colour printing for geological maps had begun only a few years before on the continent, and even there had only been employed in a limited way. As related by Darragh, since “the Geological Survey of Great Britain did not adopt colour printing until 1895, Selwyn’s staff had to be innovators in this instance”⁵⁹ and had tried tendering the work out to local lithographic contractors, first to Fergusson and Mitchell, and then to Joseph Aresti “who seems to have been the first person to colour print a geological map in Britain...the first edition of Robert Mylne’s geological map of London in 1851...” and who had by the late fifties emigrated to Melbourne. However, because neither produced results to Selwyn’s satisfaction, eventually Thomas Ham had been transferred from the Lithographic Branch of the Lands Department where he was at the time working as an engraver and lithographer to the Geological Survey. Here, on a lithographic press purchased in January 1851, he had produced

the first colour printed maps of the Melbourne and Kyneton areas...during that year. The work was done on a hand press and each sheet of paper had to go through the press once for each colour. Since there were up to seven colours, it was a very time-consuming process to print 1,000 copies of each map.⁶⁰

It was the Sydney engraver and publisher William Baker who had the distinction of having published the first atlas in Australia, *Baker’s Australian County Atlas*, between 1843 and 1846⁶¹; prior to 1840 all other atlases of Australia had been published abroad. In 1835, Baker had set up the Hibernian Printing Office, from where he published many maps, particularly for the Surveyor General’s Office. By the sixties, Frederick Proeschel had perceived the need for a new atlas, and in 1862 had begun the production of the *Atlas Containing a Map of Australasia...* which he intended to sell in Britain as well as on the local market. With the actual maps covering just the eastern portion of Australia, this atlas

appeared amidst much acclaim in 1863, twelve different format options being offered, choices available including the (long) title being blocked in gold. Although the local engravers were Brown and Slight, it is not certain that the printing had been local—it may have been done in England as the atlas was entered at Stationer's Hall. However, according to Darragh “it was not listed in the *London Catalogue of Books*, which includes all books published in London with their publishers and prices.”⁶² However its local publication, at a time when the inland exploration of Australia was contributing much new information, had given it “the advantage of being up to date.”⁶³ Not long after the appearance of the *Atlas*, in 1864 Proeschel returned to France where he died in 1870. Darragh commented that “despite the importance of his maps, his return to France at the pinnacle of his career in Melbourne meant that he was quickly forgotten and his maps supplanted by others issued by publishers resident in Melbourne.”⁶⁴ However, printers such as Ham and Proeschel had led the way, seeding the private printing business environment with regard to the viable local production of maps, a genre that played an important part in colonial times, and for which colour printing was proving particularly useful.

Illustrations

Concerning the reproduction of illustrations, John Arnold has written that by the 1880s photo-engraving for the production of relief line blocks had reached Australia, and that:

This photo-engraving process began to replace the engraving of wood blocks. There was also the capability to reproduce photographs by the half-tone process...In lithographic printing the traditional stone slab was replaced by a flexible grained zinc plate, onto which a photographic image could be developed. In addition, new techniques made possible the cheap reproduction of illustrations in colour and tone.⁶⁵

Colour Printing Takes Root in New Zealand: The Early Period

Overseas Publications Concerning New Zealand

Although printing technology first came to New Zealand shores in 1830 with the missionaries and then particularly with the settlers, most of this early local printing was textual in nature. Nevertheless, as discussed in chapter 3, from the early days of European contact, there had been ongoing concern with the visual record. Besides images of New Zealand made by the early voyagers, others were created by both the first visitors and the residents. The Maori was a commonly chosen subject for images depicting New Zealand. Augustus Earle, who had already been active in early Australian printing, is well-known as a pioneer in this area, for example, as seen in his *A Narrative of Nine Months' Residence in New Zealand in 1827* which was published in London by Longman in 1832. As pointed out by E.M. and D.G. Ellis (Literature Review: 29, 36) these images are also among rare examples of New Zealand prints created using the technique of aquatint.⁶⁶

After settlement in the eighteen forties, published images of New Zealand began to become more common, especially those published abroad. In fact it was usual for such graphics including maps and plans, to be produced overseas. Some of these were prepared before the departure of the settlers, for instance, the hand-coloured 1839 plan drawn by Samuel Cobden for the New Zealand Company prior to the sailing of the *Tory* for Wellington. Entitled 'A Proposed Plan of the City of Wellington in the First Settlement in New Zealand Founded 1839-40', it betrays by its adoption of a standard grid street plan a complete lack of topographical knowledge of the site.⁶⁷ The 1840 'Plan of the Town of Wellington Port Nicholson, the First & Principal Settlement of the New Zealand Company 14th August 1840', prepared as a hand-coloured lithograph,⁶⁸ is mentioned in Carter's *Catalogue of Books on New Zealand* as one of a collection of six "views, maps and plans, relative to the colonization of New Zealand from 1840 to 1842", its in situ origination being attributed to Captain W.M. Smith.⁶⁹ Such hand-coloured plans indicate that the element of colour was present in New Zealand cartographic representation from the first, while an advertisement such as the one that appeared in the local newspaper, the *New Zealand Gazette and Wellington Spectator* on September 2nd, 1843, suggests that such items were widely available—"Just Received. Plans of the Town of Wellington. Plan of the Harbour of Port Nicholson."⁷⁰

Prints with New Zealand colonial subject matter also were appearing, especially overseas, for example, 'Birdseye View of Port Nicholson' which was drawn and lithographed in London by T. Allom from drawings and charts prepared by Charles Heaphy and others, probably in 1839 during Colonel Wakefield's Survey, and published by F.G. Moon in 1840.⁷¹ This item was a two-tone lithograph finished with hand-colouring. It was later also printed by Hullmandel and Walton and published as a hand-coloured lithograph by Trelawney Saunders, probably in 1843.⁷² For prints also, if colour was to be added at this stage it was commonly by hand, as for the early lithograph of Wellington 'Port Nicholson from the Hills above Pitone in 1840', also drawn by the New Zealand Company surveyor-artist Charles Heaphy, but printed in London by Smith Elder & Co. For this print, which is held in the Alexander Turnbull Library, the publication date has been estimated as around 1845, illustrating the time lapse that could occur between origination and printing because of the remoteness of the colony. By this time, some lithographs were being printed in Britain with colour added from the press, early examples of a New Zealand image treated in this way being 'Birdseye View of Port Nicholson' (above) which is recorded by the Ellises as a "lithograph in tints", first "printed by C. Hullmandel."⁷³ Another early example, John

Saxton's 'The Town and Part of the Harbour of Nelson in 1842 About a Year after its First Foundation', published also in London around 1845 by Smith, Elder & Co., appeared as plate VII in E.J. Wakefield's *Illustrations to Adventure in New Zealand* as a three part panoramic tinted lithograph printed by Day & Haghe, the London firm which was well-known for its colour printing expertise.⁷⁴

Early Local New Zealand Printers and Products

First New Zealand Lithographic Printing

Entry no.57 in Herbert Williams' *A Bibliography of Printed Maori to 1900*, first published in 1924, concerns a sheet of text, which is not recorded in Bagnall:

57. [Writing Copy]

407 x 330. A sheet containing an alphabet and fifty-nine Maori words arranged alphabetically, printed in copperplate script.

This item, held in the Alexander Turnbull Library, is in fact a lithograph in the form of a placard, which does not bear a title, date or imprint, but which was in fact printed as a lesson sheet: a template to be copied by pupils learning to write. Consisting of four columns of Maori words, with a Maori alphabet at the bottom, significantly, this lesson sheet appears to be the first known lithograph printed in New Zealand.⁷⁵ During research on early Maori imprints, Philip Parkinson traced the background to this item. He states:

The Southern District of the CMS wrote to the Northern district on 17 December 1838 "From the very urgent demands of the natives for lessons of writing & figures: Resolved that Mr Wade be requested to prepare a supply with the lithographic press as soon as possible." Two days earlier a meeting of missionaries at Tauranga, attended by Henry Williams resolved: "That the N.D. Committee be requested to urge the most active exertions of the press [...] & beg to reiterate our request that Mr Wade may supply us with lithographic lessons of writing and figures." (Minutes of Meeting of Missionaries S.D. Dec. 15 1838, in ATL-Micro-MS-Coll-04-33, CMS Archives CN/ Mv. 11 pp. 308-309). These requests were probably instigated by Robert Maunsell who was visiting the Bay of Islands in November 1838 and he probably provided the text for Wade to print. No other lithographs from this press are recorded.⁷⁶

Parkinson therefore attributes this lithograph to Robert Maunsell, who appears to have produced it, probably a short time later, in 1839, "on the lithographic press brought out by William Wade in 1834."⁷⁷ The order for the press is recorded in the Church Missionary Society's Day Book for 1831-1834 as having been placed by Mr. W. Day in June 1834: the cost of £33.11.0 was to be paid for a "Lithographic Press, Rollers &c: o/a N. Zeald."⁷⁸ William Wade had come to New Zealand as Superintendent of the Missionary Press with William Colenso, who is known as an explorer and scientist, but who was also a trained printer. William Wade and The Rev. Maunsell, who was a linguist, were both resident missionaries in New Zealand and were friends. Both had a keen interest in the Maori language as well as in improving the literacy of the people of Aotearoa. In 1838 during a period spent travelling, observing and learning in the North Island, Wade had visited Maunsell at Moeatoa, and recounted one of his own learning experiences:

Mr Maunsell's native, a sharp, and rather pert lad, afforded much help in improving my acquaintance with the language; as he readily agreed, for a trifling remuneration, to set me right whenever I spoke incorrectly.⁷⁹

Along with other "Printing Apparatus and Material in the Printing Office", including "1 Columbian Press, complete" and "1 Stanhope Press, complete", the presence of the lithographic press used for the printing of this lesson sheet is recorded in an 'Inventory of Printing and Binding Apparatus' which lists items that, having been in the possession of the Church Missionary Society, were transferred in 1843 by William Colenso to John Telford, among whose papers the Inventory is now preserved in the Alexander Turnbull Library. Along with the press, other lithographic materials recorded on the inventory are "14 stones" and a box of "Sundries used in Lith. Printing. (the whole of the foregoing is in good condition; a large proportion being entirely new.)"⁸⁰

During the period under study, lithography was to become a major printing process for the production of images rather than for text in New Zealand, where, from the start, nearly all early textual printing was letterpress, and newspapers, consisting at first mainly of text, were early the ubiquitous local print products. However, in New Zealand it was to be in the visual sphere of lithographic image production that the first known printed colour was to appear.

Images: The First Prints and Maps Produced in New Zealand

The earliest map to be produced on New Zealand shores was also a lithograph, an 1841 chart of Port Nicholson. In the same year, the first lithographic print had appeared as a black and white reproduction of William Mein Smith's pen and brown ink drawing *Lambton Harbour & Mount Victoria from the Tinakore*,⁸¹ in which there was nothing to be seen of Wellington city apart from a few scattered houses. R.P. Hargreaves has discussed the chronology of these two items in the 1982 paper 'The First New Zealand Lithographs.'⁸² However, since the lesson sheet of 1839 predates either of these items, the chart and print, rather than being the first lithographs ever to have been produced here, are the first known lithographed graphics to have been made in New Zealand. Mein Smith, who was the New Zealand Company's Surveyor General, lived on the slopes of the Tinakori hill, and consequently the view was probably from his own house. Both the chart and the print were published in Wellington by the firm of Jones and Bluett.⁸³ R.P. Hargreaves considered that since the primary production from this firm was cartographic, the black and white view was more of an incidental extra.⁸⁴

In February 1840 the first shipload of settlers had arrived on the Petone foreshore, but to escape the swampy conditions created by the Hutt River at the Petone site, only a few

months later, in September, a move was made to the Thorndon site beside the Tinakore Hill. For the establishment of the colony, it had been maps and plans that were the printed graphics items primarily needed, but at the time most were being printed in England. However, the fact that the first lithographed graphic produced in New Zealand was the chart printed by Jones and Bluett points to an early need for local map and plan printing capability.

It appears that in the case of the 1841 chart, chance had played a part. Edward Main Chaffers, a New Zealand Company nautical surveyor, had made a chart of Port Nicholson in September 1839, and the manuscript had been sent back to London as was usual. In the opinion of Hargreaves, the Wellington lithograph was not made until 1841 when Jones and Bluett began their lithographic business, probably after Thomas Bluett's arrival from Tasmania, most likely because the original intention to copy it by means of woodcut had not gone ahead due to the loss of the copy kept in Wellington for this purpose. Eventually the lithograph was produced, probably "from the English edition first published in London by James Wyld on 1 June 1840," but not without difficulty: at the time only a platen press was at hand, the only one in Wellington. For this first locally produced map, J.W. Jones had been the lithographer and Thomas Bluett, who, as mentioned, had originally trained in London, was the printer. The 13.4 x 10.2 inch 'Chart of Port Nicholson New Zealand' went on sale on 27 May 1841 for 2d 6d a copy.⁸⁵ Since a separate price for a coloured version was not mentioned by Hargreaves, presumably it was available only in black and white. Unfortunately, since the Hocken library copy has gone missing, this item has not been available for inspection to determine this point.⁸⁶

However, I have sighted a copy of a hand-coloured version of a similar chart that had been printed for an article in the *Westminster Review* of "Jan^y 1841" entitled "'Emigration' or Comparative Prospects of our New Colonies".⁸⁷ This may have been produced from the first June 1840 Wyld edition, and could have been the source from which Jones and Bluett later produced their Wellington lithograph, as the area for Wellington City, designated on it as "Town of Wellington," and the mouth of the Hutt River (in pink) were both included: these were the two areas in the Jones and Bluett map described by Hargreaves as having differed from the original Wyld version. The rest of the *Westminster Review* map, which bore the imprint at the bottom left-hand corner "Waterlow & Co. Lith^{rs}", was coloured blue. It is also possible that the Wellington map may have been derived from the 1840 chart 'Port Nicholson, or Wangenuea-tera' mentioned by Hargreaves as having been published in 1840 by the Hydrographic Office from an unofficial 1826 survey. On the same sheet as the

Waterlow chart, an accompanying map showed New Zealand's relationship to Australia, in which a part of South Australia was shown in blue, Australia Felix in yellow, and Van Diemens Land and New Zealand both in pink. An edition, although inferior, of Chaffers 1839 chart of Port Nicholson had also been lithographed by R. Clint in Australia in 1840, and another in 1842 when the British Admiralty published Chaffers' chart as "the official hydrographic chart of the port."⁸⁸

Soon after their initial efforts, Jones and Bluett had felt the need to build a press better suited to their purpose of lithographic printing. Distant from the centres of printers' supplies, they set about the task of building it themselves, so also demonstrating the efficacy of the now well-known New Zealand institution, the 'do-it-yourself' principle. In the same year, on this new press, Jones and Bluett printed 'Plans of Wellington': as in August 1841 a local advertisement had announced the availability of the item, in both black and white and coloured versions.⁸⁹ It was probable that for this item the element of colour had been added by hand.

On 15th September 1841, Thomas Bluett had begun publishing the *Victoria Times* as a weekly. The first issue, consisting of four pages, has the flat appearance of lithographic printing and bore the statement: "Printed and published every Wednesday morning by Thomas Bluett, at the lithographic printing office, Wellington Terrace." The use of lithography to also print the periodical had enabled the printers to present one of their maps to the readership: 'Plan of the City of Wellington Port Nicholson New Zealand 1841' constituted the back page. This was partly intended as an advertisement for the graphics side of the business, although accompanied by something of an apology for the standard of lithographic printing they had been thus far able to achieve:

The public are respectfully informed that the *Victoria Times* will in future be published on Wednesdays. The proprietors hope to present to the public a better specimen of lithography in their future numbers.⁹⁰

Although it appears that this was to be the only issue of the *Victoria Times*⁹¹, Wellington now had a printer able to take in graphics job printing:

Thomas Bluett begs respectfully to inform the public of Wellington that he is now prepared to ['print'] maps, plans, drawings, cards and printing of all kinds. Terms very moderate.⁹²

In the same year, Jones and Bluett produced the 28 x 40cm 'Plan of Wadestown Adjoining the City of Wellington New Zealand' depicting land which was "the property of Messrs Watt and Wade laid out in building lots 1841." The survey work had been carried out by Robert Park, an assistant New Zealand Company surveyor under William Mein Smith. From inspection of a copy, it seems that Jones and Bluett had again pushed the

technological boundaries—instead of using lithographic stone, Jones had transferred the plan to zinc and Bluett had then lithographed it—the statement “on zinc by J.W^m Jones” appeared at bottom left and “T. Bluett Lithog. Wellington” at the bottom right. Outlines were in black, while the yellow, blue, brown and pale purple had been applied by hand.⁹³ Not long after their early foray into lithography in Wellington, Jones and Bluett parted, and at that point Thomas Bluett apparently returned to Tasmania, where the next year, as mentioned, he had been responsible for adding colour from the press to some of John Skinner Prout’s prints.

Technology and the Early Colonial Print Culture: Processes, Equipment and Expertise

The initial attempts at lithography by the Wellington firm of Jones and Bluett highlighted at once the colonial printer’s difficulty in obtaining equipment with which to accomplish the task. Not least was the lack of a suitable press, especially where map printing was concerned, for there had been a long history of the use of copperplate printing in the area of cartographic production. The failure of the attempt to use west-coast limestone as lithographic stone, due to its impurity, meant that even this essential piece of equipment still had to be imported, as was the case with most printing materials.

However lithographic printing continued in New Zealand, the early use of the medium, especially for local image publishing being consonant with the fact that, just before the major European colonisation of New Zealand, in the major printing centres of the world, by the eighteen thirties, engraving had begun to make way for lithography. The relative newcomer to the printing scene was increasingly being used and began to be the dominant means of image reproduction. In New Zealand it was the process of choice to fulfil local requirements for cartographic printing and topographical sections.⁹⁴ By the eighteen sixties the general standard of much of the printing equipment was improving, while an influx of immigrants during the gold rushes brought more suitably trained tradesmen to New Zealand, including lithographers, and in this climate, especially in Dunedin, many lithographic firms were established. Those arriving had originated from a range of countries, but many came via Australia.

Some firms that had begun business in New Zealand around this time had Australian affiliations, as did Fergusson and Mitchell who were responsible for some early tinted lithographs published in Dunedin by 1868. Others were arriving with colour printing expertise from Britain, for instance, Henry Heath Glover, Ward and Reeves’ lithographer in Christchurch, who had trained in Britain and gained further experience in Melbourne. Lithographers had occasionally emigrated from other places, as did the German

chromolithographer John Schmidt, who arrived at the west coast gold-fields in 1860. In Dunedin, the British-trained immigrant Thomas George, who later took up tint and chromolithographic colour printing, had also arrived in the gold-rush era. J.L. Gregory, his pressman, was another immigrant who had come to Dunedin from London via Melbourne. (See chapter 7.)

It was the case that, particularly at first when equipment and expertise was scarce, most locally printed maps and plans, mainly modest productions, were in black and white, and where colour was desired, it was feasible for such short-run production to have added it by hand. But at this stage, much cartographic printing concerning New Zealand was being accomplished by specialist British map-printers, and this continued for a long time to come.

Illustration

Alongside the rise of lithography, throughout the nineteenth century engraving was still commonly used to accomplish illustrative work, although the latter was routinely produced in black and white, an early example of engraved illustration of New Zealand, published in London in 1843, being Henry Chapman's *The New Zealand Portfolio*.⁹⁵ In this period, British book publishing firms often had several engravers working on a set of plates for one book, however, in the image-making context, it must be noted, as pointed out by E.M. and D.G. Ellis, that the term 'engraver' can mean engraver, woodcutter, lithographer, aquatinter, or etcher.⁹⁶

In spite of the thrust towards a scientific portrayal of New Zealand, especially at first, not every image relating to the newly discovered lands was in the nature of an accurate record. Some of the early images produced by overseas engravers to accompany texts about New Zealand have been found to be misleading as far as accurate conveyance of information is concerned. This was because such images were sometimes printed from blocks and electros that had been originated in relation to another context. Some were re-engraved to fit the text in hand, and some have even been found to contradict the text. Periodicals were more prone to suffer from this problem, perhaps because of the publishers' priority to cut costs. Books, intended for a wealthier audience, suffered to a lesser extent.⁹⁷

Printers and Products At Home and Abroad

More authentic views of New Zealand were those later produced by colonists in situ, as well as officers stationed in New Zealand, missionaries, and surveyors, some of whom began to create images in various media, although watercolour was the popular medium of the times, it being common for army officers to be trained watercolourists. Some of the locally

produced pictorial records were published for overseas audiences in such well-known magazines as the *Illustrated London News* which had begun in the eighteen forties. Numerous wood engravings and etchings made from local sketches in the three decades following settlement were carried in this publication. Themes included “early colonial New Zealand’s scenic wonders, natural and man-made disasters, battles and defensive positions, colonial towns and villages, sports and entertainments, searches for riches, isolation, and appreciation of Maori and colonial pakeha lifestyles.”⁹⁸ However, as Laurie Barber has observed, images were sometimes produced by overseas staff artists, who, not being familiar with the Antipodes, would occasionally confuse images from New Zealand with those from Australia, for instance images of the Maori and the Aborigine. Local publications of this kind did not appear until the sixties.⁹⁹

James Buchanan is of the opinion that images published in the pictorial newspapers “probably did more to shape the attitudes of Britons to the New Zealand Maori than did a hundred governors’ or missionaries’ reports.”¹⁰⁰ Significant events in the life of the colony were also being recorded graphically for overseas publication and thus for posterity, for instance ‘Ceremony of Laying of the Foundation-stone of the New Houses of Assembly’. Although the event had been in March 1857, this picture did not appear in the *Illustrated London News* until the 8 August issue. Depicted in the March 5 1864 issue, ‘Opening of the First Railway in New Zealand, at Christchurch’, included an engine and four trucks, with the crowds gathered on either side of the line, the Southern Alps as a backdrop, and many flags flying. After the Australian prospector, Gabriel Read, found gold in Otago in May 1861, by August over 200,000 diggers had congregated at the gold fields: the whole phenomenon of the gold rushes yielded many fascinating sketches that were later printed. In such ways pictorial expectations were being fostered, both at ‘home’ and in the colonies.

One aspect of New Zealand that lent itself to the pictorial was the natural scenery, and this category of image was also well represented among those produced in the early decades of European colonisation. Some that commanded particular attention overseas were images of the more unusual natural features, such as ‘Te Tarata (The White Terrace), Rotomahana Lake’, and ‘Otukupuerangi (The Pink Terrace), Rotomahana Lake’ of 1874, such depictions acting to promote New Zealand as a desirable travel destination. In the case of the pink and white terraces, after the features themselves were obliterated in the disastrous 1886 eruption of Mt Tarawera, it was the images that remained to contribute thereafter to their legendary fame.

The decade of the eighteen sixties was the period in which the land wars broke out in New Zealand, and these had a major effect especially in the Waikato and Taranaki. This was also the period in which local artists became more numerous and a few local publications were appearing. One such was W.I. Grayling's *The War in Taranaki, During the Years 1860-61* that was published in New Plymouth by G.W. Woon. This work included New Zealand illustrations in the form of wood engravings executed by H.F. Rawson, the town dentist, as well as three hand-coloured maps, for which several colours were employed. For instance, for 'Map of the Omata District Shewing the Relative Positions of the Military and Civilians at the Battle of Waireka', roughly applied hand-colouring was in light blue, dark blue, brown, salmon, yellow, red and dark brown—used as solids as well as combined with lines and other symbols.¹⁰¹

For the important 1847 publication, *New Zealanders Illustrated* by G. F. Angus, the colour plates had been printed in tints with extra colour added by hand. Thus soon after colonisation, image-making concerning New Zealand was beginning to include colour from the press, although commonly being executed overseas, typically in London as it was for this work. However, the great majority of nineteenth century images of New Zealand, whether published in New Zealand or overseas, were in black and white, but in spite of this, there were some early signs that the art of colour printing was not to remain beyond these Antipodean shores for long. In 1857, the first payable goldfield in the colony had opened at Collingwood, and after the major gold discovery in Otago the period of economic prosperity in New Zealand that was ushered in especially in the South Island was directly attributable to the wealth engendered by gold, although when the rush was over and hard times had arrived, by the eighties the ephemeral nature of this phenomenon became manifest. But by the decade of the sixties many New Zealand businesses had become well established, including those concerned with printing.

It has been noted that one of the reasons for the colonisation of New Zealand was the quest for a more democratic way of life, and this was reflected in the most dominant print production of the time, the newspaper, itself a symbol of the democratic principle. Among printing processes, it is lithography that has been described as intrinsically democratic, largely because it has made possible the wide dissemination of affordable images. E.M. and D.G. Ellis have observed that, partly because lithography was more easily learnt than wood or metal engraving, and also because the equipment needed was simpler and required less outlay, most of the images "drawn, engraved and printed in New Zealand were lithographs."¹⁰²

When in the sixties there had been a rapid increase in the number of established presses, they had been required mainly for newspaper and the associated jobbing printing, but many of the presses introduced at that time were the two-feeder Wharfedale flatbed cylinder presses¹⁰³ that were also suited to lithographic printing. (Plate 5.) By the sixties and seventies, commercial lithography had become very well established in both islands of New Zealand, so that the stage was set, firstly, for text production as a largely letterpress environment in which associated relief printing of images on engraved blocks was possible, and secondly, for the production of maps and prints in a largely lithographic environment. In the second half of the nineteenth century it was to be in both the letterpress and lithographic environments that colour from the press was to appear.

Early Local Colour Printers and Colour Printing in the 1860s

Handcolouring as Precursor

In New Zealand, it was the firm of G.T. Chapman that had taken the lead in local print publishing. Although many of Chapman's prints were undated, some early lithographic prints bear dates from 1861 onwards. Before coming to Auckland, George Chapman, a lithographer by training, had initially settled in Otago in 1849, but answering the call of the gold fields, had been to seek his fortune in Victoria, and, after this had returned to Scotland. In 1855, Chapman eventually came back, this time settling in Auckland where he also began a bookselling, stationery and publishing business. Some of Chapman's lithographs, which were sold with manually applied colour, for instance the 1861 print 'Auckland, New Zealand Harbour and Offing',¹⁰⁴ are in keeping with the long hand-colouring tradition that preceded colour printing in Europe. However, in New Zealand, the resources needed for hand-colouring editions of any size were absent: there were no local teams of suitably trained handcolourers, a condition that reinforced the practice of repatriating the printing especially of long-run items for which colour was required.

Early Tinted Lithographs

In the Old World centres of printing, the appearance of any new print process that had been employed to produce items in black and white had often been closely followed by attempts to use it to also print in colour, and in New Zealand, because the process of lithography was being used for much early graphic production, it was a natural development that in time lithographic capability was extended to allow the addition of the element of colour from the press, especially for prints and maps, as had already occurred overseas. One of the early

Plate 5: Advertisement for printing machines from Payne and Sons and cutting machines from J.G. New. Published in *Typo*, 3 (26 October 1891): [2] foll. 124.

By permission of the Alexander Turnbull Library, Wellington, N.Z., New Zealand and Pacific Collection. Ref. No.: S-L 362-2

TYPE, 20th October, 1889

PATENT IMPROVED WHARFEDALE

SINGLE AND TWO-COLOUR PRINTING MACHINES.

Paynes' Special Wharfedales.

Paynes' Universal Treadle Platen Machines.

Paynes' Small Swift Cylinder Machines.

Paynes' Swift 2 and 4 Green News Machines.

All Machines are fitted with New

Patent AUTOMATIC

and Treadle

Patent AUTOMATIC and Treadle

PAYNE & SONS, Ouley, Yorkshire, England.

LONDON: HOPKINSON & COPE, Farringdon Road.

"Leader." * "Invictus." * "Automatic."

STRONG, ACCURATE AND RELIABLE.

"Automatic" Cutter.

Cuts : 26 to 42 inches.

Prices : £40 to £90.

Fitted with 16-Clay in steam
Gear as illustrated
hand Clamp

"Invictus" Cutter.

214 in. ... £22.

214 in. ... £27.

214 in. ... £32.

The frame is of wrought iron, giving
great strength to the machine.

"LEADER" Platen — 11 in. x 9 in. in 1880 ... £20; 8 in. x 11 in. ... £30; 6 in. x 13 in. ... £40. These Machines are supplied with 16-Clay in steam gear, as illustrated, and hand clamp. These Machines are supplied with 16-Clay in steam gear, as illustrated, and hand clamp.

"SWIFT LEADER" Platen, 11 in. x 9 in. in 1880 to 1885 ... £24. Steam Gear, 16-Clay in steam gear, as illustrated, and hand clamp. These Machines are supplied with 16-Clay in steam gear, as illustrated, and hand clamp.

"RESISTLESS" Paper Cutters. 11 in. x 9 in. in 1880 ... £12; 8 in. x 11 in. ... £16; 6 in. x 13 in. ... £20. These Machines are supplied with 16-Clay in steam gear, as illustrated, and hand clamp.

"COMBINATION" Stereo Foundries, Rubber Stamp Making Apparatus, &c., &c.

For complete Illustrated Catalogue apply to **J. G. NEW,** BIRMINGHAM MACHINISTS' CO., Parade Iron Works, BIRMINGHAM.

R. COLEMAN HARRISON, Printer and Lithographer, 10, Hastings Street, Napier, New Zealand, October.

attempts at local tint lithography was in association with a locally published periodical, for which the text was printed in letterpress. Two decades after the birth of the *Illustrated London News* in England, from the sixties onwards, the nineteenth century had seen the rise of both illustrated newspapers and periodical literature in New Zealand. One of the first illustrated weeklies had been the *Dunedin Leader*, which ran from 1863 to 1867, although at first this typically consisted of perhaps a single front-page black and white engraved portrait.¹⁰⁵ The first illustrated monthly magazine published in New Zealand was the *Southern Monthly Magazine*, an Auckland publication which lasted from March 1st 1863 until February 1st 1866. Illustration for this early magazine even ran to printed colour, and during its life five lithographs in tints appeared, one of the principal lithographers being John Varty who also ran an Auckland book-selling and stationery business. The advantage possessed by lithographic colour as opposed to hand-colouring and intaglio colour was the ease with which solid tone could be printed, "achieved by covering the entire printing surface of the stone with grease."¹⁰⁶ (See also chapter 9.)

Also in the sixties, some early lithographers working as artists were beginning to add colour from the press. In Auckland an early foray into lithographic work in tints was made by Miss Cotton who around 1862 had produced the 'Panorama of St John's College'. This lithograph in tints, a panorama in eight parts, was made from the drawings of her sister, Caroline Abraham, the bishop's wife.¹⁰⁷ George O'Brien, a South Island artist, had been experimenting from the sixties in lithography in Dunedin, carrying his painterly interest in colour into this side of his work. O'Brien also worked in Dunedin as an engineer and architectural draughtsman. Born in Ireland, O'Brien had previously worked in Melbourne before coming to New Zealand in 1863, and by 1865, twenty-eight of his paintings, mainly watercolours, were on show at the first exhibition of the Otago Art Society. O'Brien's tandem interest in lithography began to bear fruit also, as he began work to reproduce the paintings of other artists, with at least one being destined for publication in tints at the time. O'Brien is credited with carrying out the drawing for the tinted lithograph, 'Wiltshire Bay, Mouth of Clutha River', from a sketch by A. Hamilton. This item, lithographed in colour by the Dunedin firm Fergusson and Mitchell in 1868, was one of three lithographs printed in colour for Vincent Pyke's *Province of Otago*, published by the Provincial Government Dunedin in 1868.¹⁰⁸ Later O'Brien's work itself was to be reproduced in colour. By the eighteen eighties, the process of chromolithography was being used for this purpose, and was the method by which a full colour reproduction of O'Brien's 'Dunedin, 1888' was printed by Caxton and Company, also probably in 1888. The artist engaged to do the

preliminary drawing for this reproductive work was P. McIntyre, and the publisher was W. J. Pricor. Almost a century later O'Brien's paintings again came on the market as full colour reproductions, this time printed in photomechanical offset colour lithography by the Christchurch firm Avon Fine Print.

The Beginnings of Full Chromolithography in New Zealand

One of the early attempts in New Zealand to go beyond tint lithography to produce a fully fledged chromolithograph appears to have been made around 1861 by the Christchurch firm of Ward and Reeves when they first formed a partnership. Dated by Brian Lovell-Smith as "ca 1860?" their 'Geological Sketch Map of the Province of Wellington, N.Z.' was probably among the first items to which several colours had been added from the press, the ten shades used for this map being juxtaposed. (See also chapter 11.) Another early chromolithographed item, published by the lessees C. & J.T. Bray and thought by the Ellises to have been printed in 1861 by the Nelson firm of Hodgson and Friend, was a pictorial poster timetable. This effort at full colour from the press was for the 'Timetable for the Dun Mountain Bus' that consisted of forty-three vignettes of local buildings and scenes around a large view of the Dun Mountain Bus full of passengers shown in shades of brown and grey on a golden background, and set off with touches of black. Lettering stood out in red, white and brown. Ellen Ellis has mentioned that this firm "regarded themselves as artists" and an 1860s almanac had referred to them as portrait painters also.¹⁰⁹ The bus, a horse-drawn conveyance, was leased by C and J. T. Bray, and ran for fourteen miles between Nelson and the Port on three-foot gauge wooden rails that constituted the Dun Mountain railway. Opened in 1861, it had the distinction of being the first railway to be built in New Zealand.¹¹⁰ The date of 1861 given by the Ellises for the 'Timetable' varies from the tentative date of 1867? given for the copy in the Alexander Turnbull Library,¹¹¹ but since the first bus ran in 1861, presumably the first timetable would have been created to coincide. Concerning a photograph of a Dun Mountain Bus timetable held at the Nelson Provincial Museum, M.R. Johnston is of the opinion that "from the views depicted on the timetable, it must have been issued between late 1866 and very early 1868..."¹¹² (Plate 6.)

By 1865, the year that Wellington became the capital city with the removal of the seat of Government from Auckland, chromolithographic colour printing had become a part of the

Plate 6: 'Timetable of the Dun Mountain Bus'. The bus ran between Nelson and the Port.

Chromolithograph, 57.5 x 45cm.

Published by the lessees C. & J.T. Bray, printed in Nelson by Hodgson & Friend, between 1861 and 1867.

By permission of the Alexander Turnbull Library, Wellington, N.Z., Drawings and Prints.

Ref. No.: C-069-001.

TIME TABLE

OF THE

DUN MOUNTAIN BUS

RUNNING BETWEEN NELSON & THE PORT.

LEAVES NELSON

A.M.	P.M.
9.0	12.30
9.30	1.0
10.0	2.0
10.30	2.30
11.0	3.0
11.30	3.30
12.0	4.0
	4.30
	5.0
	6.0

LEAVES PORT

A.M.	P.M.
9.15	12.15
9.45	12.45
10.15	1.45
10.45	2.15
11.15	2.45
11.45	3.15
	3.45
	4.15
	4.45
	5.15

After Six, p.m., the Bus will run till Ten p.m., hourly, from Trafalgar-street.

N.B. After the above hours, the Bus will run to suit the arrival and departure of Steamers.

Fares:—From 9 a.m. till dark, 3d. each passenger; after dark, 6d.

Parcels and Luggage delivered with care on the line of route.

C. & J. T. BRAY, Lessees.

business at the firm of Ward and Reeves, and in that year they were awarded a Bronze Medal in this category at the New Zealand Exhibition in Dunedin, the first exhibition featuring printing to be held in the country. In the preface to the *Reports and Awards of the Jurors* printed in Dunedin in 1866, Alfred Eccles, the Honorary secretary and one of the Commissioners for the exhibition, (and the only person awarded a gold medal), said that while the objects of the New Zealand Exhibition were "much more comprehensive" than those of "merely local exhibitions previously held in the Colonies", or those that had been popular in the English industrial centres, they were "restricted and humble" compared to the great International Exhibitions. Such comment demonstrates by its awareness of New Zealand's place in relation to northern print cultures an interest in more than the narrow colonial scene. Indeed the exhibition included many items printed overseas, which could be used as touchstones by local printers. In this context, special mention was made of chromolithography in the *Reports and Awards*, where, in the 'Fine Arts' section it was reported that numerous works, "mostly by British artists" had been contributed, "chiefly by Otago gentlemen", including fine engravings. It was noted in particular that "the Chromo-Lithographs exhibited by Mr. Turnbull and Mr. Farjeon, showed the great perfection to which that modern and very beautiful art has been already brought."¹³

The main aim of the exhibition was defined as both to diffuse useful information and to "disseminate a knowledge of the great natural resources of the Colony". The report on 'Printing' included comment on the branches of engraving and lithography, and gave a useful summary of the inside view of the state of the industry in New Zealand at the time. While reflecting an optimistic outlook, including for the future of colour printing in the colony, the report recognised limitations:

The display of Printing, Engraving and Lithography is on the whole creditable to the Colony. There is no reason why, except in the higher branches of engraving and ornamental printing, we should not produce as good examples of the art in this Colony as the printers of Europe. The higher rate of wages has attracted to the Australian Colonies some excellent mechanics, and some of our principal printing establishments are provided with machinery of the latest construction. The printing of the Colonial newspapers is quite on a par with that of many English Journals, and books have been printed and published in this Colony, the typography of which is very creditable.

In Engraving and Ornamental Printing very great advance has been made of late years. Wood engraving as an art is as yet almost unpractised in New Zealand, the demand for works of this character not being sufficient to attract skilled artists, or to induce local effort. On the other hand, plenty of occupation is found for Lithography, and for some years we have been independent of foreign aid with reference to engraving and lithography for commercial requirements. Latterly, the art of Chromo-Lithography has taken root, and is likely to flourish."¹⁴

It is indicative from the statement that ornamental printing and "the higher branches of engraving" were considered the areas in which New Zealand printers could not yet be expected to compete with the standards of the Old World, and that, demonstrably, these

were the areas in which it was most obvious that time was needed to develop further expertise. The medal awarded to Ward and Reeves, Canterbury, for “the successful introduction of Chromo-lithography into New Zealand,”¹¹⁵ represented a land-mark in this area of New Zealand print culture. In the ensuing years, chromolithography was the process used by this firm particularly to apply colour from the press for maps and plans, as well as for other items such as early prints that were part of reports for official purposes. (See chapter 7.)

At this time, and throughout the latter part of the nineteenth century, many of the books recording the increasing knowledge about New Zealand were still being published in England. This was especially so if extensive colour printing was required, for example, in the case of Buller’s famous *A History of the Birds of New Zealand*, which was first published in London in 1873 by John van Voorst. However, as time went on, more local colour printing began to appear as printers tried the processes that had been pioneered on the other side of the world. By the seventies, the full range of processes available overseas were also in use in New Zealand, although it was not to be until 1889 that the first full-colour book of plates, as distinct from separate plates¹¹⁶, was to appear. John Andrews has pointed out that “publishing in London was not a piece of colonial snobbery,”¹¹⁷ but rather was a result of the fact that there were not the resources in the country at that time for any large-scale chromolithographic printing. However, for those printers of New Zealand who did venture into full colour graphical printing, chromolithography was to be the favoured method of colour printing until the photomechanical processes were later harnessed for colour and beyond. As will be seen, even after the photomechanical revolution, chromolithography continued to be used to some extent in New Zealand, at least to the end of the period under study.

Overseas, by the beginning of the eighteen sixties, the technical environment for printing was already beginning to alter, as the processes of lithography and photography were becoming interlocked. Around the beginning of 1860, vital improvements were being researched on both sides of the world, and in both Australia and in Britain, efforts were being made to find new processes that would allow flexibility and cost cutting, importantly, for governmental lithographic printing. Some of the results were to contribute to changes in lithographic printing practices around the globe, including in New Zealand, and these changes were also paving the way for new approaches to colour printing.

Response to Question 1

Before the period under study, printed communication, particularly of visual images concerning Australasia, had first become a part of European print culture due to European exploration in the southern oceans prior to European settlement. However, because first Australia and then New Zealand were annexed by the British, it was a British print culture that was initially brought to these shores, making these colonial print cultures closely related to the parent and to each other. Consequently, when established in 1830, early printing in New Zealand carried with it similar cultural traditions that had already been transported to Australia in the late eighteenth century with the first printing presses taken to that colony.

During the period under study, British culture was undergoing a period of change, and a part of this was the technological advances associated with the nineteenth century industrial revolution. A transition from a hand-tool, small workplace culture to a factory culture employing machinery and powered tools was occurring, in turn enabling more efficient mass production in the printing industry. As the rise of the working class called for a more democratic social order in which the general demand for betterment included a thirst for education, social behaviour and tastes were changing, and were being reflected in a greater demand for printed materials of all kinds, and this included the desire for printed colour.

Growing mechanisation in the printing industry, and the development of new processes for image-making began to provide the means to meet increased demand, and a diversification of print products followed. Part of the technical change was the ability for printed colour to gradually replace established hand-colouring traditions. Hence at the time of establishment of printing in New Zealand in 1830, industrial and socio-economic changes in nineteenth century Britain were sowing the seeds for the appearance of both a mass market for print materials and new means for print production to satisfy demand, that was now also including new ways to satisfy an old demand for colour.

In the decade before the phase of European settlement had begun in earnest in New Zealand in 1840, early print culture, first established by the missionaries, had been undertaken with the intention of imparting to the desirous Maori people such benefits of the European culture as literacy and education, as both parties saw them. The necessary technological means of establishing a print culture in the colony had also been transported with first the missionaries and then the settlers. Especially on the part of New Zealand Company settlers, the eventual British settlement was envisioned to include as much replication as possible in

the southern colonies of what was perceived to be advantageous in the British culture, and considered to be necessary to the colonial culture. This included the continuing presence of print.

Demonstrably, the desire was there for the maintenance of cultural ties, and necessitated the maintenance of communications, a condition that was, in the period from 1830 to 1914, dependant on shipping, as were other aspects of the colonial culture, importantly for print culture, for the delivery of necessary supplies that could not be readily obtained from the new environment or locally produced. The colonial economies of Australasia were therefore essentially dependent economies, and were at first also essentially based on primary industry. Consequently, within both the Australian and the New Zealand economies, the service industry of print production was characterised by heavy dependence on the parent culture although subject to modification through the necessity of adaptation to local conditions.

The wish to preserve, propagate and develop print culture primarily according to the inherited British mode applied as much to colour printers as to others, and was the basis for an effort to keep abreast of northern hemisphere technical developments, early seen in the transfer of lithographic printing to the southern colonies. Through shipping links with Britain, communications were maintained and the fact that many essential supplies were obtained from 'Home' continued to reinforce the initial orientation to a British development. However, the relative geographical and cultural proximity of New Zealand with the Australian colonies facilitated ongoing links with the close neighbour. As immigrants tended to move in response to economic opportunity, particularly when gold was discovered in any locality, this was an influential factor as the New Zealand print cultures developed during the period, tradesmen particularly crossing the Tasman in response to the new major Otago discoveries. The presence of printers from a variety of European countries in the Australian colonies was in this way also a potential source of later cross-fertilization within the developing New Zealand printing trades, although some immigrants also came directly from European countries.

In New Zealand two early local strands that had developed—tending towards pamphlet and some book production mainly for the Maori population on the one hand, and of particularly newspaper publication on the other—had been in response to the fact that the population after settlement was composed of two culturally different groups, Maori peoples and recent settlers of largely European origins. It was to be as a part of the European strand that colour

printing later largely developed. However, the relative geographical isolation from the northern parent culture was an important factor influencing local development within which the necessary cultural adaptation of immigrants to local conditions was taking place. As well, difficult land access between early population nodes in both Australia and New Zealand had tended to make colonial print cultures regionally oriented, especially at first, imposing further insularity. In the face of such isolation, for cultural interchange to be maintained, continuing communication was imperative, and, for these settlements, often seaports, until infrastructure that facilitated internal communications was achieved, orientation to 'overseas' rather than to each other was reinforced as shipping provided the main communication links. In relation to New Zealand, Australia was the nearest overseas destination.

For the printers, regular communication was vital to the desired continuance of contact with the parent British trade that was necessary if local development of colour printing in the mode of British culture was to occur. The trade journals available to New Zealand printers were one important conduit of such communication, increasingly facilitating cross-fertilisation not only for the parent British print culture, but for the Antipodean colonial cultures as time went on. In the eighteen eighties the local New Zealand journal *Typo* became such a medium and made its mark overseas. In this way, dialogue had begun to replace what had hitherto tended to be, where information had been available at all, a largely one-way trade communication to colonial New Zealand from the northern hemisphere. Such discourse gradually brought more diversity to both British and colonial printers as a more international stance began to emerge within the printing trade.

However, in New Zealand, where the relatively small local population meant that markets were limited, for local colour printers the economy of scale was not achievable. The colonial context in which the marketplace of print was being established was not providing the same mass market conditions that were developing in nineteenth century Britain. Hence the tendency was that, especially where expensive colour printing was concerned, such production was commonly repatriated to Britain. In the emerging New Zealand colonial industrial printing environment in which colour printing was being established, newspaper and associated jobbing printing was in the ascendant, rather than the more expensive book production that had greater viability in Britain. Even in Britain the development of less expensive colour printing was being driven by the nineteenth century mass market demand for cheaper coloured books, and gradually fewer colour printers were pursuing expensive colour-printed book plate production.

Although there had also been a French presence, missionaries and early settlers initially transferred a largely British culture to New Zealand. Local conditions that differed from those left behind were interacting background factors that influenced the way in which colonial print culture had been established and had progressed, and consequently also were affecting the development of colour printing within it. Such factors were remoteness from, compared with proximity to Old World printing centres; a small population scattered in relatively isolated settlements compared with overall increasing population pressures and growing aggregations in large centres; less class definition and more scope for individuality compared with a defined class stratification within which middle classes were rising; a population composed of both European settlers and Maori peoples compared to the more ethnically homogenous population in Britain and the superimposition of a factory industrial mindset on an established indigenous agrarian culture compared with a changing industrial environment in which arts and crafts were giving way to factory mechanisation.

Such factors were influencing the nature and development of early New Zealand print culture so that, lacking the structure and richness of the British culture, in an industrial environment characterised, especially at first, more by improvisation than scientific experimentation, and where importation rather than the local manufacture of requisite materials was the prevailing condition, it was within a dependent primary industry-based colonial economy that printing was developing as a service industry. Although a narrower, two-stranded and already changing print culture, it was however, an essentially British culture in an Australasian setting in which the first colour printing was to appear around thirty years after printing had first begun in Aotearoa.

Response to Question 2.

(See also Comparative Time-chart: Figure 9: Volume 2, Appendix 1A)

By the time of the European annexation of New Zealand in 1840, it had been in the northern hemisphere centres of printing, including those in Britain, that the major nineteenth century scientific, technical and engineering innovation that paved the way for colour printing was proceeding, rather than in the Antipodes, where, although printing was beginning to take root, colour printing was yet unknown. In the earlier established Australian colony, where the first letterpress printing had begun in Sydney over three decades before letterpress had reached New Zealand in 1830 with the missionaries, relief was the dominant form of printing. Both planographic and intaglio printing had been transferred to Australia before 1830, at first from Britain, but there had also been early influence from elsewhere.

Although in New Zealand it had also been letterpress printing that had been first established in 1830, the first lithographic printing had been accomplished before 1840 European settlement. The pattern of the transmission from Britain of letterpress printing that would best fulfil everyday needs for textual printing, followed by the introduction of other printing technology to provide local graphic needs, especially for printed maps and plans, was repeated in New Zealand. However, between the 1788 settlement of Australia and the 1830 introduction of printing in New Zealand had come the invention of lithography, and it had been this technically simpler alternative to intaglio methods that had been first used for graphics printing in New Zealand.

In the period from 1830 to the first introduction of chromolithographic printing into New Zealand in the eighteen sixties, early Australasia was gradually acquiring the technology found essential to its early print cultures, and which was to enable further steps towards the introduction of colour printing to be taken later, including, importantly, the lithographic methods that had been newly introduced into Britain over the early decades of the century prior to the period under study.

The pattern of ongoing introduction of new technology and its further improvement that had occurred in Britain in the first two decades of the nineteenth century had included the appearance of the iron presses that afforded greater efficiencies for letterpress printing, and also of the lithographic processes and presses which allowed the introduction of planographic printing. This pattern was being repeated in Australasia, but rather than presses being manufactured in the Antipodes, importation into these colonies in ships was the norm, a situation that continued in New Zealand, although in Australia, some were later manufactured in situ on "license".

In the new printing environment, such presses were not ousting older technology as in Britain, but were the means for the establishment of new southern nodes of printing. In New Zealand, both letterpress and lithographic methods were in use before the 1840 British annexation. As well as the traditional letterpress technology, it was the newer lithographic technology that had been introduced into Britain in the early decades of the century that was being transported to New Zealand to found colonial graphics printing, but only what was required to fulfil initial needs. In this way, the technological stage for New Zealand colour printing was being set both in the letterpress and the lithographic styles.

In that roughly twenty-five year period between the early 1840s and mid-1860s before colour printing began in New Zealand, in the Old World, much experimentation concerning

colour printing and the underlying processes that would enable its further development for mass production was being pursued, both in England and further afield, especially in Europe. Particularly important parallel research for colour printing concerned the photographic processes and the behaviour of colour.

Although the chromolithographic printing precedents were being set in England in the decade of the thirties, the years that printing was just being established in New Zealand, almost thirty years was to elapse before chromolithography became a viable business option in that colony. Time was required for the establishment of a fledgling service printing industry, the growth of a production environment in which colour had a place, and for the acquisition of suitable knowledge, expertise and equipment. In addition to continuing British influence, other skills were being derived from the neighbouring Australian colony where both tint lithography and chromolithography had already taken root in a print culture already cross-fertilised by resident practitioners from places other than Britain.

That lithographic colour printing was the first colour printing in New Zealand had been due to prior northern hemisphere discoveries and developments. Because New Zealand printing was developing within cultural traditions largely derived from Britain, especially in the early years when colonial developmental emphasis was on building necessary infrastructure, printing technology and supplies continued to be almost wholly imported from Britain. These were important factors determining that New Zealand printing continued to follow on the heels of British technical trends, although in the new place now circumscribed by colonial printing conditions and market needs. Accordingly, as had occurred in Britain and also in Australia, New Zealand colour printers had tended to employ tint lithography as the forerunner to full chromolithographic printing.

However, because such printing developments in Australia had preceded advances in the later settled New Zealand colony, the opportunity had been there for New Zealand to gain knowledge from its neighbour, especially via the immigrants who transferred. The eighteen sixties gold discoveries in New Zealand proved to be the trigger for such influence to arrive with the sudden population influx that came especially from Australia. Consequently, the order of the transmission and introduction of technical advances in New Zealand was influenced not only by the progress of the printing arts in northern hemisphere print cultures, especially as imported directly from Britain, but were also subject to the interests and innovative characteristics of individuals emigrating from elsewhere, particularly those coming from the neighbouring colony Australia. An early example had been Thomas Bluett

from Tasmania who extended lithographic boundaries in Wellington in order to provide needed graphics, especially maps and plans. In a colonial culture in which mobility was common, and in a place where distance from the northern hemisphere created long supply delays, the innovative impulse was in early evidence as it was activated to supply inventive technical solutions to local pressing needs, as in the case of Jones and Bluett who in response to the lack of the lithographic press they required in Wellington, improvised to build one.

Although intaglio processes were transmitted to Australia, it appears that such methods did not find a place for colour printing in New Zealand to any great extent, possibly because, unlike in the trans-Tasman neighbour, printing in this country did not begin until after lithography had been invented overseas. By 1840, the newer planographic technology, which had already spread from Germany to Britain and elsewhere, was providing simpler means, particularly for colour graphics printing. However, also in the Australian colony, by this time the simpler lithographic processes were becoming an important means for graphics printing, and this acquired technology was later built upon in order to produce colour-printed maps, a genre for which there was great demand in the colonial situation.

Meanwhile, in Britain, by the mid-fifties, before much colour printing of any kind had been accomplished in Australia, and graphics colour printing in New Zealand had not yet begun, the rising tide of chromo-lithographic expertise was beginning to oust the older block and metal colour printing methods. In New Zealand, where, however, lithography was by that time becoming more widespread, as printers continued to follow northern, and in particular, British trends, it was to be the techniques of chromolithographic printing that were to provide the major route to colour from the press for a great deal of the future local graphics production, although introduced later than in the parent culture. But by the early eighteen sixties, even as chromolithographic printing had its first New Zealand beginnings, in Britain and elsewhere the photographic means for important future colour printing directions were already being introduced.

¹ P.A. Griffith, Ross Harvey and Keith Maslen, eds. *Book & Print in New Zealand: A Guide to Print Culture in Aotearoa* (Wellington: Victoria University Press, 1997), 46.

² *Ibid.*, 45.

³ D.H. Borchardt, *Australia* [Spread of Printing Series] (New York: A. Schram [etc.], 1969), 13-14.

⁴ Wallace Kirsop, 'Modern Australian Publishing: An Historical Perspective' in G.E. Gorman, ed., *Australian Studies: Acquisition and Collection Development for Libraries* (London: Mansell, 1992), 28.

⁵ Roger Butler, 'Lithography in Australia: Melbourne 1948-1958', in *Lasting Impressions: Lithography as Art* (London: Alexandria Press, 1988), 283.

- ⁶ Thomas A. Darragh, *The Establishment and Development of Engraving and Lithography in Melbourne to the Time of the Gold Rush*, ([Thumb Creek, N.S.W.] : Garravembi [Press], 1990), 9.
- ⁷ *Ibid.*, 20.
- ⁸ Butler, 'Lithography in Australia', 284.
- ⁹ Darragh, *The Establishment and Development of Engraving and Lithography in Melbourne to the Time of the Gold Rush*, 31.
- ¹⁰ Butler, 'Lithography in Australia', 377.
- ¹¹ Cedric Flower, *The Antipodes Observed: Prints and Print Makers of Australia, 1788-1850* (South Melbourne, Vic.: Macmillan, 1975), 112.
- ¹² Butler, 'Lithography in Australia', 377.
- ¹³ *Ibid.*, 284 and 377. (See also "Hobart Town Courier, 17 April 1854.)
- ¹⁴ Flower, *The Antipodes Observed*, 116.
- ¹⁵ R.M. Younger, *Australia! Australia! The Pioneer Years: A Pictorial History* (Adelaide: Rigby, 1975), 168.
- ¹⁶ Brian Pope, *Western Australia: The 4d Lithograph, 1854-1864*, with biographies of the 15 recorded examples of Western Australia 1854 4d. inverted frame by L.N. Williams (Melbourne: Royal Philatelic Society of Victoria, 1984), 40.
- ¹⁷ *Ibid.*, 1.
- ¹⁸ *Ibid.*
- ¹⁹ *Ibid.*, 12.
- ²⁰ *Ibid.*, 17.
- ²¹ *Ibid.*
- ²² *Ibid.*, 23.
- ²³ Penfold, W.C. & Co. Ltd., *A Century of Progress in Printing: The Story of W.C. Penfold & Co. Ltd.* (Sydney: W.C. Penfold, [1930]), 33.
- ²⁴ Butler, 'Lithography in Australia', 377.
- ²⁵ Jürgen P. Wegner, in notes to facsimile ed. of J. Degotardi, *The Art of Printing in its Various Branches: With Specimens and Illustrations*, (1861; facsim., Sydney: The Officina Boronia, 1982), un-numbered page.
- ²⁶ Roger Butler, 'Lithography in Australia', 284.
- ²⁷ Degotardi, *The Art of Printing in its Various Branches*, 11-12.
- ²⁸ *Ibid.*, 7-8.
- ²⁹ *Ibid.*, 12.
- ³⁰ *Ibid.*, 16.
- ³¹ *Ibid.*, facsim. copy, 1982. Held: State Library of Victoria. Note: The original was not held.
- ³² Jürgen P. Wegner describing the original, in notes to Degotardi, *The Art of Printing in its Various Branches*, un-numbered page.
- ³³ Degotardi, *The Art of Printing in its Various Branches*, 19-20.
- ³⁴ Wegner describing the original in notes to J. Degotardi, *The Art of Printing in its Various Branches*, un-numbered page.
- ³⁵ Degotardi, *The Art of Printing in its Various Branches*, 21.
- ³⁶ *Ibid.*, 9-10.
- ³⁷ R.V. Tooley, *The Mapping of Australia*, with an index compiled by Douglas Matthews (London: Holland Press, 1979), 259.
- ³⁸ *Ibid.*, 261.
- ³⁹ Signal-Point Museum, Goolwa, South Australia, display item.
- ⁴⁰ T.M. Perry, *The Discovery of Australia: The Charts and Maps of the Navigators and Explorers* (Melbourne: Nelson, 1982), 157.
- ⁴¹ Tooley, *The Mapping of Australia*, 307.
- ⁴² Michael Richards and Maura O'Connor, *Changing Coastlines: Putting Australia on the World Map 1493-1993* (Canberra: The National Library of Australia, 1993), 22-23.
- ⁴³ Robert Clancy, *The Mapping of Terra Australis* (Macquarie Park, N.S.W : Universal Press, 1995), 148-149.
- ⁴⁴ Tooley, *The Mapping of Australia*, 249.
- ⁴⁵ *Ibid.*, plate 182.
- ⁴⁶ Darragh, *The Establishment and Development of Engraving and Lithography in Melbourne to the Time of the Gold Rush*, 21-27.
- ⁴⁷ *Ibid.*, 26.
- ⁴⁸ Thomas A. Darragh, 'Frederick Proeschel, Colonial Mapmaker', in *BSANZ Bulletin*, 15 no. 3 (March 1992): 105.
- ⁴⁹ *Ibid.*, 110.
- ⁵⁰ *Ibid.*, 115.

- ⁵¹ Ibid., 116.
- ⁵² Ibid., 122.
- ⁵³ Ibid., 124.
- ⁵⁴ Ibid., 127.
- ⁵⁵ Ibid., 140.
- ⁵⁶ E.W. Skeats, 'Some Founders of Australian Geology: David Lecture', no.1, 1933 (1934), 12: cited by Thomas A. Darragh, in 'Geological Survey of Victoria under Alfred Selwyn, 1852-1868', in *Historical Records of Australian Science*, 7no.1 (1987): 1.
- ⁵⁷ Thomas A. Darragh, 'The First Geological Maps of the Continent of Australia', in *Journal of the Geological Society of Australia*, 24 pt. 5 (September 1977): 280.
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- ⁵⁹ Ibid., 5.
- ⁶⁰ Ibid.
- ⁶¹ Darragh, 'Frederick Proeschel, Colonial Mapmaker', 144.
- ⁶² Ibid., 151.
- ⁶³ Ibid., 160.
- ⁶⁴ Ibid.
- ⁶⁵ John Arnold, 'Printing Technology and Book Production', chap. 6 in Martyn Lyons and John Arnold, eds., *A History of the Book in Australia, 1891-1945: A National Culture in a Colonised Market* (St. Lucia, Qld.: University of Queensland Press, 2001), 108.
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- ⁶⁸ National Library of New Zealand, *The Art and Life of the Early Surveyor: An Exhibition to Commemorate the Centennial of the New Zealand Institute of Surveyors: Drawn from the Collections of the Alexander Turnbull Library: National Library Gallery, 28 July to 23 September 1989, Wellington, New Zealand*, [exhibition selected and researched by Marian Minson; exhibition co-ordinator, Peter Ireland] ([Wellington, N.Z.]: National Library of New Zealand, [1989]), 7.
- ⁶⁹ C.R. Carter, *Catalogue of Books on or Relating to New Zealand: To Which is Added Remarks on Book Purchasing and Booksellers in London* (London: Printed by Bowden, Hudson & Co., 1887), 99.
- ⁷⁰ *The New Zealand Gazette and Wellington Spectator*, Saturday September 2nd, 1843, page preceding the 'supplement'.
- ⁷¹ Alexander Turnbull Library, Tapuhi [database online], C-029-002.
- ⁷² Ibid., C-029-006-b.
- ⁷³ Ellises, *Early Prints of New Zealand*, 95, entry 298.
- ⁷⁴ Alexander Turnbull Library, Tapuhi [database online], reference, B-080-032.
- ⁷⁵ Philip Parkinson, unpublished note, EMI 0027#, April 2000.
- ⁷⁶ EMI 0027#, April 2000.
- ⁷⁷ Parkinson, April 2000.
- ⁷⁸ Church Missionary Society Archives, University of Birmingham Special Collections, 'Day Book 1831-1834', reference, F/F3, 657. (Entry noted September 2000 by Dr. Sydney Shep.)
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- ⁸³ Anne Kirker, 'Lithography in New Zealand: A Coming of Age', in Pat Gilmour, ed., *Lasting Impressions: Lithography as Art* (London: Alexandria Press, 1988), 296.
- ⁸⁴ R.P. Hargreaves, 'The First New Zealand Lithographs', 50.
- ⁸⁵ R.P. Hargreaves, 'Chaffers Chart of Port Nicholson', in *New Zealand Geographer*, 2 (1965): 172.
- ⁸⁶ As at January 2001.
- ⁸⁷ University of Otago, Hocken Library, Poster Collection, item.
- ⁸⁸ Hargreaves, 'Chaffers Chart of Port Nicholson', 2 (1965): 172-173.

- ⁸⁹ Hargreaves, 'The First New Zealand Lithographs', 51.
- ⁹⁰ *Victoria Times*, no.1 (15th September, 1841), [3]. Held: Alexander Turnbull Library, Newspaper Collection.
- ⁹¹ G.H. Scholefield, *Newspapers in New Zealand* (Wellington: Reed, 1958), 27.
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- ⁹³ Alexander Turnbull Library, Map Collection, item: Acc.1445.
- ⁹⁴ Kirker, 'Lithography in New Zealand: A Coming of Age', 296.
- ⁹⁵ Alexander Turnbull Library, Tapuhi [online database], Publ-0048.
- ⁹⁶ Ellises, *Early Prints of New Zealand, 1642-1875*, introduction.
- ⁹⁷ Roger Collins, 'Putting the Pictures Back in their Books: Early French Images and Accounts of New Zealand', unpublished paper given for 'In Visible Languages: The Visual Dimension of Print Culture', New Zealand History of Print Culture Conference, Wellington, August, 1997.
- ⁹⁸ James Buchanan, *Sketches from Early New Zealand: Some Nineteenth Century Engravings*, introduced by Laurie Barber (Auckland: David Bateman, 1985), 15.
- ⁹⁹ R.P. Hargreaves & T.J. Hearn, *New Zealand in the Mid-Victorian Era: An Album of Contemporary Engravings* (Dunedin: McIndoe, 1977), introduction.
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- ¹⁰³ R.A. McKay, ed., *A History of Printing in New Zealand 1830-1940*, 103-104.
- ¹⁰⁴ Ellises, *Early Prints of New Zealand, 1642-1875*, 160.
- ¹⁰⁵ Hargreaves & Hearn, *New Zealand in the Mid-Victorian Era*, introduction.
- ¹⁰⁶ Bamber Gascoigne, *How to Identify Prints: A Complete Guide to Manual and Mechanical Processes From Woodcut to Ink Jet* (London: Thames and Hudson, 1986), 27a.
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- ¹⁰⁹ Ellen Ellis, *New Zealand Poster Book 1830-1940* (Wellington: Reed, [1977]), plate 6.
- ¹¹⁰ Ellises, *Early Prints of New Zealand, 1642-1875*, 162.
- ¹¹¹ Alexander Turnbull Library, Tapuhi [database online], C-069-001, downloaded 3/8/00.
- ¹¹² Alexander Turnbull Library, Drawings and Prints, M.R. Johnston, DSIR District Geologist, to the Alexander Turnbull Library, Nov. 1986 Ref., TL/3/1/1/2. Note: Johnston was uncertain whether the photograph was from the Alexander Turnbull Library item.
- ¹¹³ New Zealand Exhibition, *Reports and Awards of the Jurors* (Dunedin: Mills, Dick & Co., for the Jurors, 1866), 499.
- ¹¹⁴ New Zealand Exhibition, *Reports and Awards of the Jurors*, 236-237.
- ¹¹⁵ *Ibid.*, 516. Also reported in McKay, 103.
- ¹¹⁶ Ellises, *Early Prints of New Zealand, 1642-1875*, 160.
- ¹¹⁷ J.R.H. Andrews, *The Southern Ark: Zoological Discovery in New Zealand 1769-1900* (Auckland: Century Hutchinson, 1986), 189.

SECTION III

The Technology: Colour Printing Processes and Equipment

CHAPTER 5

INVENTORS AND INNOVATORS: TECHNICAL ADVANCES FOR COLOUR PRINTING IN TWO HEMISPHERES

Research Question:

3. What was the range of colour printing possibilities available over the period to British printers? Which ones were taken up by New Zealand printers and which ones were not; which ones were adopted quickly and which were adopted slowly, and what were the reasons?

Introduction

In anthropogeographical terms, significant changes in human cultures have always been seen to be associated with industrial artifacts, and hence with the technological abilities that the cultures possessed to produce them: it was partly as a result of a growing ability to make and use tools that homo sapiens became a separate species. Thus the theme of technology has always been closely associated with the historical dimension of human culture. In chapter 2 I have observed that many cultural changes have gone hand in hand with underlying technical changes. Within print culture this has been a key factor and particularly relates to the production phase of the book cycle, both to the printing of texts and the printing of images. For colour printing in particular, the technological theme lies at the heart of an understanding of the development of both the graphic and the typographical sides. For these reasons, the technical theme has taken a central place in the Production Conceptual Model showing themes appropriate to the study of the development of colour printing in New Zealand. (See chapter 2: 68.)

In the area of print production, interactions within the technical arena can be seen as those involving the inventors and developers of state of the art technology, the transmitters of new technology from place to place, and the users of the technology, both individual artists and commercial printing firms. In volume 2, appendix 2A-B an outline of relevant northern hemisphere inventors and developers of the technologies used in colour printing during the period under study has been given as background to this chapter which will look at Australasian innovators in the field, as well as some aspects of the transmission to New Zealand of the technical processes that underpinned colour printing in this country.

Laying the Ground for the Commercialisation of Colour Printing

One of the greatest discoveries of the nineteenth century that was to revolutionize the world of the image was the invention of photography. Not only was photography to open up an entirely new way to create images, but also was to offer the printing industry an entirely new approach to the preparation of printing surfaces, and this caused far reaching changes. Over the latter part of the century, graphic printing was to be transformed and new photomechanical means began to supersede the hitherto greater reliance on manual processes. Other important inventions that led to this photomechanical revolution, by which the increasing mechanisation of commercial picture printing became possible, were those of electrotyping and the half-tone screen. Coupled with these specific inventions it was the advance made in colour theory, as well as research particularly into inks and colour specific sensitive coatings that was to underpin the eventual commercialisation of colour printing in the nineteenth century. Such discoveries and innovations were transmitted to New Zealand, in turn underpinning the processes employed by colour printers in this country.

Linking the Photographic Processes and Image Printing: The Photomechanical Era

The photomechanical caused a revolution in the way images were printed, whether in black and white or coloured, enabling new methods to be employed in all the major printing processes that were at first pioneered in the northern hemisphere. Many processes spread to the southern hemisphere Australasian colonies. In some cases, further improvements were made by innovative individuals working in Australia and New Zealand. These men made contributions toward the general thrust for greater mechanisation, which was paving the way for the transformation of colour printing from a largely art-based pursuit, often undertaken as a private enterprise to a more scientifically-based commercial activity in both hemispheres.

Advances in Old World Photomechanical Planographic Printing:

Photolithography & Photozincography

From the eighteen sixties, the English firm of Day and Son had begun to use photographs as originals for illustrative engraving, including for chromolithographic colour work, with the photographs at first being coloured by hand. According to J.B. Waring, an example that was the most important work ever executed in chromolithography was his *Masterpieces of Industrial Art and Sculpture at the International Exhibition, 1862*, published in 1863, containing 300 plates made from 3,000 lithographic stones and using 40 tons of paper.¹ But also in the sixties, experimentation with the adaptation of photolithography to zinc printing surfaces had begun, an early work produced by this means being a facsimile reproduction in 1860 of the *Domesday Book* in two colours.

The British Ordnance Survey Department

The British Ordnance Survey Department at Southampton had been first in Britain to investigate and use photolithography for the reduction in scale of maps, from 1855 onwards. In an overview of the general history Geoffrey Wakeman noted that John Pouncy, a Dorset photographer, had coined the term photolithography in 1857 when he produced the first book with photolithographic illustrations as a way of overcoming the problem that photographs used as illustrations faded. At first the process used at the Ordnance Survey involved tracing photographs onto waxed copperplate for etching and printing.² Experimentation on both sides of the world led to a later transfer method, known at first in England as photozincography, in which first a negative of the page to be reproduced was exposed over paper coated with gelatine and light sensitive bichromate of potash, coating the resulting print with photo transfer ink, and washing to remove surplus ink. Then the photo transfer print was laid down on the zinc plate to transfer the ink image ready for printing.

Although written about in 1860 by several authors, including Henry James, the Director of the Ordnance Survey at that time, the process of photozincography, or photolithography as it was more commonly known, was not used widely, including for colour, until the nineties. As mentioned, in Great Britain colour printing was not adopted by the Geological Survey until 1895.³ Geoffrey Wakeman has reproduced the entire preface written by James to a handbook on the technique in his book *Aspects of Victorian Lithography*⁴, since only a few copies of James' work have survived, in which James set out his version of the history of photozincography. However, in an 1884 lecture, Bolas said he considered that "the invention came before its time, neither good litho machining nor zinc-etching being practised at the time."⁵ Both these things militated against equal development of nineteenth century colour printing across all the major printing processes. Michael Twyman has said that the eventual development of three and four colour-work for lithographic and intaglio colour 'process' printing was also delayed by the limitations of the printing processes themselves.⁶ (Literature Review: 12.)

Some Australian Innovators and the Photographic Processes

Photography and Alfred Bock

In Australia the advent of photography had occurred two decades before it became linked with lithography to create the useful photolithographic processes of the sixties. Alfred Bock, who was half-brother to William Bock the early Wellington engraver and chromolithographer, was the first photographer to be born in Australia in 1835. Alfred's step-father was Thomas Bock, an early Tasmanian resident artist and photographer. By the

late forties Alfred was assisting his step-father with daguerreotype portraiture,⁷ but in the sixties, Alfred began to turn his interest to producing colour images, experimenting with the production of colour sennotypes, as he was an “official user of the process”. These were produced by a method that “involved making two identical prints, the top one being waxed and the bottom broadly hand-coloured” so that the appearance was one of considerable solidity and relief when both prints were in register.⁸ Thus Australasian innovation in extending photographic applications were early in evidence, and later it was to be in the field of the application of the new photographic arts to printing that significant contributions were to be made by inventors in both Australia and New Zealand.

John Osborne and Photolithography in Victoria

It was during the period of the early mapping of New South Wales that the steel engraving process, which extended the life of the plates, was becoming popular with overseas map publishers. R.V. Tooley considers that this had the effect of delaying the general use of lithography for map printing until more towards the middle of the nineteenth century, although the two techniques had been invented at around the same time.⁹ Most early maps of Australia were printed overseas, but even after the introduction of lithography for local map printing, for the same reasons as in the Old World, it was not until the latter half of the nineteenth century that lithographic transfer became more popular, and in Australia became the printing method generally preferred for maps. It was the process of photolithographic transfer that was pioneered in Melbourne in 1859 which paved the way for the process to become commercially viable, and was later used as a foundation process for colour printing, especially of maps, but of other items as well. (See chapter 8: For instance, A.D. Willis used photolithography as the basis for the colour printing of the illustrations for H.C. Field’s 1890 *Ferns of New Zealand*.)

John Osborne’s Pioneering Work

In the Australian government departments of the eighteen fifties, lithography had become the principal process used for local map printing, including in the Survey Department in Melbourne. It was here that John Osborne was to make his important technical advance for photolithography, a process which circumvented the necessity for the later redrawing on stone of the maps that had been made by surveyors in the field; instead the originals were transferred with the aid of photography. John Osborne’s claim was to have invented, not photolithography itself, a process pioneered in the eighteen fifties by men such as John Pouncy in England and Edward Asser in France, but to a viable transfer process for map

and plan printing, which he patented in Australia on 1st September 1859, and which was later used in Wellington at the Government Printing Office.

John Osborne (1828-1902), professional photographer, lithographer, engineer and inventor¹⁰, had arrived with his wife in Melbourne on Christmas Day in 1852, having come out from Ireland where he was born on 20 February 1828. He had first worked at the Melbourne Magnetic Survey Department, helping to establish an observatory before he was appointed to the post of photolithographer at the Lands and Survey Department on 1st March 1859, with a large increase in salary, from £180 to £300.¹¹ At the time the method used to reduce the scale of large maps or plans was a slow, laborious process, and John Osborne set about finding a new, more efficient way. Within six months, after experiments using photolithography begun in August 1859, he had succeeded.

A year later, in August 1860, a Board of Enquiry was set up in Melbourne to extensively explore John Osborne's photolithographic discoveries, amid concern by lithographers that the new process had the potential to replace their jobs. The brief was to decide whether John Osborne's new process could bring printing efficiencies into general government department map and plan printing, an aim that was also to be explored in New Zealand a few years later. The Board's tasks were to explore:

- (i) The advantages likely to be derived from the application of Photo-Lithography to the publication of maps, plans and other documents.
- (ii) The most economical arrangement for conducting the publishing branch of the Lands and Survey Department,
- (iii) To determine (in the event of a decision being arrived at in favor of the substitution of Photo Lithography) the merits, originality, and value of Mr. Osborne's invention; and the mode and amount of compensation (if any) to which that gentleman may be considered entitled.¹²

The proceedings of the enquiry were documented in 'Photo-lithography. Report to the Board Appointed by the Hon. the President of the Board of Land and Works Together With Evidence Taken Before the Board' which was printed in the *Victorian Parliamentary Papers* of 1860/61. During the enquiry, John Osborne defined his discoveries in reply to the question "where does your discovery commence in the process—state what you lay claim to as an original discovery of your own?" He replied:

In the first place, to the use of photo-lithographic transfer paper, as the medium by which to convey to the stone the impression we have obtained by light; secondly, the inking of that picture after its exposure to light under the negative, WHILE DRY...I also regard as my own peculiar invention the use of heat as applied by the boiling water when swimming the print on the back after inking, its being peculiarly favourable to the adhesion of the ink to the altered portions of the gelatinous surface...I also lay claim to the method of removing the superfluous ink after soaking by friction.¹³

From the eighteen fifties, experimental photographic processes were in progress in England and elsewhere to develop printing plates from which toned image printing could be

accomplished, such as those developed by Edward Asser and Alphonse Poitevin. In reply to questions as to the points of difference from the Asser or the Poitevin processes, Osborne said that the difference was that his was a transfer process in the sense of the accepted technical definition, that is, the original was on transfer paper and was first transferred to the printing surface from where the final impression was taken. Reading from the specifications, Osborne explained that Alphonse Poitevin's process did not involve the use of transfer in this sense.¹⁴ Regarding Asser's method, from which Wakeman has concluded that Colonel James' method was derived, and which Osborne did regard as an attempt at a transfer process, he said "I am of the opinion that my process is far superior to his (Colonel James's), and therefore superior to Asser's."¹⁵

Osborne's Victorian patent had been granted on 1st September 1859 for a discovery that, since he said he began work in earnest on 8th August 1859¹⁶, had taken less than a month to develop, once he had prepared. Geoffrey Wakeman has stated that "there is little doubt that Asser's discovery made photolithography possible during the 1860s", and that John Osborne "also used Asser's transfer method with modifications."¹⁷ However, from Osborne's own evidence given before the Board, he apparently had worked in ignorance of Assers' experiments. Osborne stated that he had not even heard of the work of Asser until after his Victorian patent was granted:

I have something to say about M. Asser's process. The first I heard of it was in February of the present year [1860], the first I heard of his name was about that time, and arose from the fact that the first description of his process was printed in a journal which I never saw, and have never been able to get, and is only in the possession of, I believe, one person in Melbourne, and it was only at second hand that I heard a description of the process; it is only since this Board commenced its sittings that I have found the early mention of Asser, that was at a meeting of the French Photographic Association on the 15th July, 1859, now the earliest news which we could possibly get of that per mail would have been on the 7th September.¹⁸

In his evidence, Osborne placed great emphasis on the fact that the discoveries that he claimed had been entirely his own. He also stressed that before he began experimenting with photolithography he had studied as much as he could in the field, and was aided in the endeavour to obtain information, especially from the photographic literature, by Mr Noone, who later recommended Herbert Deveril for the New Zealand post of photolithographer. Replying to the question "you had no previous knowledge of the process?" he said:

No, except as having read a great deal about it. I would remind you that all these processes, such as Pretch's, Talbot's and Pouncy's processes are closely associated, inasmuch as those discoverers use the same substances, gelatine and bichromate of potash, and the salts of chromium and uranium. These processes, and many others, are closely associated with this photo-lithographic series, and to study the properties of chemicals, such as those I have named, so as to be able to calculate on them for further developments, requires very extended reading: the number of researches I have made to that end has been very numerous—everything that I could lay my hands on, particularly such processes as related to engraving and photo-lithography.¹⁹

Out in the colonies, it was the literature which was the lifeline, especially for those working,

as Osborne was, at the cutting edge, but while the knowledge he had needed was available, ready access had at the time been a difficulty.

The First Efficient Photolithographic Transfer Process: Who Was First?

John Osborne had hoped also to obtain a British patent for his new process, but his agent in Britain reported to him that he thought the process had already been discovered. In answer to questions from the 1860 Victorian Board of Enquiry Osborne stated that his Victorian patent had been obtained on 1st September 1859, that on the 3rd September the first sale plan produced by the new method had been published, and by October the process was in full operation. Osborne reported to the Board that he had sent an account of the process to England on the 17th September 1859 in a private communication to Mr William Dowden of Cork, and in reply to the further query from the Board, "Would he have been likely to have communicated the result of your discovery to anybody?" Osborne said:

I fear he may have done so, for this reason – he instantly wrote to me, stating that my process was anticipated, and that therefore was not capable of being patented; thereby removing from his mind the impression that there was any further necessity for secrecy. In this he made a fatal mistake.

He also said that "I believe that Colonel James's process is so similar, it being now made public, would prevent any patent."²⁰ At first, Col. James' Office had used the Pouncy process, but had found it wanting for their purposes. In his preface to the *Handbook* of 1862, Col. James said of the timing of his own discovery:

I was staying at Ryde, in the Isle of Wight, with my family, in the winter of 1859, and whilst there a lady asked me if I knew of any means by which she could get some etchings she had made copied and printed in an inexpensive manner. After some consideration, it struck me that the chromo-carbon process could certainly be made applicable to this purpose; and on my return to Southampton the next day I brought one of her etchings with me, and had the chromo-carbon print taken and transferred to zinc the same day, and this was the first Photo-zincograph ever taken here or elsewhere.²¹

The very next day it chanced that at a business meeting connected with the Ordnance Survey, Colonel James had been asked if he knew of a process for copying Record Office manuscripts. He said that the experiment of the day before "enabled me to answer at once in the affirmative." This reply later led to the process he had devised and used (not spelt out here) being later employed for that purpose. The idea for James' new process, conceived "in the winter of 1859" must therefore at the earliest have been in the December, although, according to a letter to John Osborne from the scientist F. Hardwick (supplied to the Melbourne Board of Enquiry) the process was probably not in use in England until at least the New Year of 1860.

Kings College, London, October, 1860

Dear Sir

I have succeeded in getting for you the desired information. Colonel James' first zincograph was taken in the early part of this year, perhaps in February....²²

F. Hardwick

Either way, it appears that John Osborne, the photolithographer/engineer who had studied the subject from scratch out in the Victorian colony, had been the first to discover a reasonably efficient process of transfer photolithography as he had claimed before the Enquiry Board, and for which he held a Victorian patent, but for which he had been denied an English patent. John Osborne did not accuse Col. James of having stolen the invention, instead he said at the 1860 enquiry: "I believed, when I saw Colonel James's process, that it would silence all doubts as to the value of my process, and its originality."²³ On hearing that statement the Board's next two questions and John Osborne's replies, however, are telling:

1365. Are we to understand by that, that you consider James has taken his idea from you?—By no means.

1366. Were you simultaneous?—No I was six months before him, I patented six months before him.²⁴

Osborne meant that his patent was granted before James had used a similar process, because he had also pointed out that neither Asser nor James held a patent.²⁵ On 16th January 1861 an official letter received in the last mail by John Osborne from Colonel Sir Henry James was tabled at the enquiry:

Survey Office, Southampton, 23rd November, 1860.

Sir,

I have received your note of the 22nd September, and the pamphlet containing the account of your photolithographic process, and I beg to return my best thanks for them. The process which you have invented appears in every essential point to be identical with that invented by us, and which is described in my report to Parliament for last year...I shall be very glad to hear that you have received some reward for this discovery, for although it is the same as ours, it was made independent of ours

Faithfully yours,

"H. James."²⁶

However, it had been an English patent that John Osborne had wanted. From the pamphlet sent with James' letter (*Photozincography* by Colonel Sir Henry James, Director of the Ordnance Survey, October, 1860), Osborne commented that he had deduced the following:

At Southampton they have adopted my method of washing off the positive transfers, and abandoned that published in the first description of their process, which I stated was sure to produce ragged lines and coarse work, inasmuch as the film of ink was, as I described it, forcibly torn asunder along the boundaries of the lines. Colonel James's last specimen (characterized in his pamphlet as indicating the degree of excellence achieved) shows unmistakable signs of improvement due to this modification; but it is still, I fearlessly assert, far inferior to what I have produced.²⁷

The Victorian Board eventually concluded that Osborne's process should be used locally for the rapid production of land sale plans, and for the reduction of any other line drawings, for instance maps and illustrations for Parliamentary papers and other such Public Service work. Having estimated that his new process could cut work from six days to three hours for average line map work,²⁸ Osborne accorded free use of his patent to the Victorian Government, and for this was granted £1000 in compensation.²⁹ As mentioned, from 1866 photolithography had officially been in use in the Surveyor General's Office in Melbourne, and it was this process that was later improved upon by Herbert Deveril in Wellington.

John Osborne's new photolithographic transfer process required the original maps to be suitable for direct photographing through the negative onto the transfer paper on the stone, making necessary a closer specification of requirements to be used in the original map, for instance, for scale and lettering. Thus before photographing, the only additions then to be made by an artist were those that were in the nature of such extras as hill shading. In the early days, photolithography was not without trial and tribulation. The cause of a part of the trouble was that the photographic processes at the time were still largely dependent on the whims of the weather, as open-air photography was necessary before the advent of artificial light. During the enquiry it was brought out that in the Australian colony there were difficulties if the weather was, for example, too wet or dusty, and the summer heat was a problem because the rapid evaporation made it difficult to produce good negatives.³⁰

Despite such problems, photolithographic transfer was the discovery that set photolithography on the path to becoming commercially viable, and in time was greatly used in conjunction with many printing processes, including colour processes. At the enquiry, John Osborne suggested that photolithography potentially had a host of applications including for the transfer of postage stamps to the stone and, providing the originals met certain requirements, the reproduction of any maps at all. (See chapter 11.)

However, although it had been considered at the time of the enquiry, it was felt that the Osborne's process was not yet equal to the task of printing the maps "of an extremely elaborate nature" originating from the geological or mining departments, where printing in colours was needed. The caution was partly due to the fact that there had been problems with quality when contracting such work out in the past. During the enquiry, government geologist A.R.C. Selwyn had given evidence concerning his experience of the problems he had encountered in attempting to have colour for geological maps printed locally:

I have tried to get similar work done by contract, viz., printing in colors, this—[*producing a map of the Ballarat district*—] is a copy of the first map that was done by contract, it is completely spoiled. The contractors spoiled the first transfer on stone completely in attempting to print it, so another had to be taken, and then the printers spoiled nearly all the impressions in printing the colors, scarcely any of the boundaries were in register, and in attempting to put on the gold dots nearly all the copies were completely spoiled; that copy is not one of the worst. There were 1000 copies printed, and on receiving them I wrote the following letter to the contractors, Messrs. Ferguson [sic] and Mitchell:—

GENTLEMEN,

I have the honor to acknowledge the receipt of one thousand copies of the geological map of Ballarat, printed in colors, accompanied by your account for the same, amounting to eighty-seven pounds fifteen shillings. I have carefully examined each copy of the map, and I regret to have to inform you that out of the one thousand copies, I find only one hundred and thirty which I could receive as being in accordance with the terms of your contract, or at all equal to the specimen therein referred to; four hundred and fifteen copies are, I consider, damaged in the printing to the extent of at least one-half their value; three hundred and seventy-seven copies so much so, as to be saleable for little more than the cost of the paper on which they are printed; and the remaining seventy-eight copies are totally spoiled...³¹

This had not been a satisfactory experience: in this case the attempt at local colour printing had resulted in only about 13% of the copies being produced to an acceptable standard, and, at about 1/9d each for the printing, had been expensive to boot.

The problem of printing maps in colour for the Geological Survey had been urgent, since, as mentioned by Thomas Darragh, the hand-colouring process, which was “quite cheap in Britain, where it was usually done by children or women,” cost even more than colour printing in Melbourne: at least “2/6 per sheet.” The problem had been worked on in parallel to the investigation of processes in the same year (1859) that Osborne and others were experimenting with the application of photography to lithographic transfer. Darragh has stated that the first colour printed maps of the Melbourne and Kyneton areas had been printed on a hand-press that year, the seven colour impressions that were necessary making it a laborious exercise, and so it was decided to apply steam power to the Geological Survey lithographic printing presses to allow faster production.³²

Joseph Pittman, a clerk and draughtsman at the Survey, and Thomas Ham, an engraver and lithographer at the Land's Department Lithographic Branch had suggested this solution, and in March 1860 both men had been instrumental in the purchase of a steam power press which was operated by the Geological Survey using the Government Printer's steam engine in the basement of the GP Office. Darragh commented that “this new method of colour printing was so quick and cheap that arrears in map work were soon overcome and the sale price of the maps was reduced from 5/- to 3/-.”³³

Even in Europe, at this stage the colour printing of geological maps was not common: in England the first colour printing for such maps had been accomplished only a few years before. In 1851 Joseph Aresti had executed the first geological map to be colour printed in Britain—the first edition of Robert Mylne's ‘Geological Map of London’. However, although Aresti had emigrated to Melbourne and had also attempted colour printed maps for Selwyn in 1858, his results had reportedly been no better than those obtained by Fergusson and Mitchell. Darragh rated the eventual solution as “a major innovation in Australia” although the Melbourne commercial lithographers did not adopt this system for another six or seven years”.³⁴ The initiative to boost production using steam power appears to have been around the same time that power presses had begun to be used in Britain for map printing: in 1860.³⁵

John Osborne Develops Photolithography for Colour Printing

Later, Osborne had published papers on his invention in British, French and American photographic journals and had left Melbourne in 1862 and travelled overseas, where he continued his work to develop the photolithographic processes further, this time for colour work. In 1862, he was awarded a medal at the London International Exhibition for his process, but it was while working in Berlin that he achieved success in adapting the process for colour printing, as was reported in the Melbourne *Argus* on 27th October, 1864, after Osborne had sent some new examples of his work which included chromo photolithographs:

We believe that while Mr Osborne was in Germany he very materially altered and improved his process as there cannot be the slightest doubt that these are incomparably superior to anything he had accomplished before. Amongst them are two excellent chromo photolithographs, a branch which, if we remember rightly, he did not touch upon here.³⁶

In retrospect it can be seen that John Osborne's discovery had been of great benefit to the printing industry in that it had enabled the process of photolithography to become commercially viable.³⁷ In Australia, photolithography had soon spread to the other states as a printing method, evidenced, for instance, by the fact that the item *The Plan Showing the Adelaide and Port Darwin Telegraph Line* is noted as "Ordered by the House of Assembly to be photolithographed" in the *South Australian Parliamentary Proceedings* of 1871. Photolithography continued in use for map production, for example, for the several nineties maps from the Government Printing Department in Hobart, that are recorded in R.V. Tooley's cartobibliography as having been produced by the process.³⁸

John Osborne had later settled in America where he began the Photo-Lithographic Company, specialising in the production of maps and patent plan specifications. Osborne's process was also to be a spur to the inventions of others.³⁹ These later improvements included a relief process developed in America by Charles Henry, one of Osborne's colleagues, as well as those to be developed in New Zealand by Herbert Deveril.

New Zealand: Herbert Deveril and Photolithographic Improvement

The Need for Maps and Plans

As in Australia, in nineteenth century colonial New Zealand much work was initially concerned with surveying the land to create accurate maps and plans, and hence the need arose for graphical printing to supply multiple copies of these when required. Maps and plans were necessary to document the topography, subdivide land and to facilitate the creation of the nation's infrastructure, including the construction of roads, railways, bridges and buildings of all descriptions. As discussed in Section I, in New Zealand lithography had early been used for printing graphics such as maps. By 1863, lithography had been in

official use for map and plan printing at the Survey Office, Government Buildings, Christchurch⁴⁰ and after the introduction of colour printing into New Zealand in that city in the early eighteen sixties, some local maps began to appear in printed colour, although many still had colouring added by hand. Often maps were included in publications, for example, in official publications such as the *Appendices to House of Representatives of New Zealand (AJHR)* for which some maps and plans were being printed in tints from the early sixties, and in full chromolithography by 1870. Some were hand-coloured, for example, an 1861 'Map of the North Island...'.⁴¹ (See also chapter 9.)

Two of the early maps concerning Taranaki land disputes that were published in 1863 in the *AJHR* had been first copied into a notebook in the field at Golden Bay by Mr McKay, the Assistant Native Secretary at Collingwood in the Nelson Province, from originals "sketched in the sand by Ropoama and other natives,"⁴² and later lithographed from the copy. One of these maps, a 36 x 29cm. black and white ['Plan of the Land Purchased at Waitara'] bears the statement "J. Varty. Lith. Auckland,"⁴³ the same lithographer who had executed tinted lithographs for *The Southern Monthly Magazine*. Ropoama Te One, who was described here as "the most important chief of the Ngatiawa Tribe", had drawn the larger (29 x 24cm.) map, 'Copy of Sketch Made by Ropoama Te One, on the Beach, at Pariwhakaoho, Massacre Bay, on the 7th May, 1861, Shewing the Portions of the Disputed Land at Waitara, Which Belonged to Himself, Te Teira, and Wiremu Kingi Rangitakei, Respectively', signed at Collingwood by James McKay and dated 20th June 1861. Of interest with regard to the map's later printing is the fact that in the 1863 *AJHR* it was reproduced in black and white, whereas the legend indicates that the original manuscript copy (made from the sketch on the beach on 7th May, 1861) had been hand-coloured in three tints: pink; "shews the land belonging to Wiremu Kingi Rangitakei"; green; "shews the land belonging to Ropoama Te One" and yellow; "shews the land belonging to Teira". The cartographer Philip Barton speaks of this map in the recent '*Maori Cartography and the European Encounter*', mentioning that at the time, "any copy of [such a] map made and kept in New Zealand would have been in color".⁴⁴ At the bottom the map bore the statement "Varty, Lith, Auckland".

The next year, in 1864, it was apparent that attempts were being made to reproduce the maps for the *AJHRs* by adding the colour using the lithographic press. Some maps that appeared to accompany 'Further Papers Relative to Native Policy...'⁴⁵ bore statements of responsibility showing that they had been lithographed in Auckland, both by John Varty and by G. Pulman. Some maps were in black and white, some had added hand-colouring, and

one was partially printed in colour. This map was entitled 'New Zealand, North Island, Sketch Showing Approximately the Extent of White Territory, and the Districts that have Fed the War'. However, in addition to the black outline only one colour (pink) was printed, a second (green) and third (blue-pink) colour having been added by hand. "G. Pulman, Auckland, Lith." appeared on this map, which accompanied a 'Memorandum by Charles Heaphy, C.E. on the Native Land Question'.⁴⁶

Some maps were produced by printers in private business for publication as a part of a book, for instance, those that were published in the *Handbook of New Zealand* by James Hector, the director of the Geological Survey. The first edition of the *Handbook* was printed in Wellington in 1879 by Lyon and Blair, who published many maps. (See chapter 7.) One of the *Handbook* maps was a sketch map of New Zealand bearing the imprint 'Deveril-Photolitho'.⁴⁷ Maps photolithographed by Herbert Deveril had been published also in the *AJHRs*, for instance, the 'North Island of New Zealand Sketch Map' which had been printed for the Public Works Department and published as a monochrome lithograph in volume 1 for 1875. This map bore the acknowledgements: "drawn by A. Koch" and "photolithographed at the Govt. Printing Office, Wellington, N.Z. by H. Deveril." (See chapter 9.)

1875 was also the year in which Herbert Deveril, who was responsible for further technical improvement to the process of photolithography, had written a paper in which he discussed the innovations that he had made to this planographic photomechanical process. R.A. McKay observed in 1940 that next to the introduction of the linotype machine for type setting, the introduction of the camera into printing had made the greatest effect on the progress of the printing trade to that time.⁴⁸ In this regard New Zealand print culture was no exception. For Herbert Deveril's paper on photolithography, a process that was later to be much used as a basis for printing in colours, the publishers were, again, Lyon and Blair, a firm who would themselves have had a vital interest in such advances because of the particular relevance to map printing processes.

Herbert Deveril Moves to Wellington

Herbert Deveril, who was both a photographer and lithographer, had arrived in New Zealand on the Rangitoto on 7 June 1873 with his wife and children. Deveril had previously practised as a photographer in Australia in partnership with Thomas Flintoff at Ballarat and Melbourne and also on his own account in both of these places.⁴⁹ Deveril's arrival in New Zealand was at the request of the New Zealand government after it had been decided to begin reproducing maps and plans in facsimile or on a reduced scale at the Government Printing (GP) Office by the process of photolithography. As has been mentioned, the

assistance of Mr Noone, photolithographer to the Victorian government since the sixties, was requested in obtaining a suitable appointment to the similar position to be created in New Zealand. It was not the first time that there had been an Australian connection with regard to an important appointment for the GP Office, for Joseph Wilson, appointed as the first Government Printer in New Zealand, had been born in Hobart, and had come to New Zealand in 1841 at the age of four. In his *History of the Government Printing Office*, W.A. Glue stated that the establishment of a lithographic branch at the New Zealand GP Office had occurred some years before Deveril's arrival, in 1867.⁵⁰

Being at that time responsible for a complete survey of the colony, it had been Dr Hector who had first suggested photolithography as a way of cutting the time and cost of reproductive work undertaken by the Government Printer for other government departments, and in 1871 at Hector's request Julius Vogel had undertaken to inquire about the process in England and to provide a report on the possibility of using photozincography at the GP Office. The papers comprising the report entitled 'Information Obtained by the Hon. Julius Vogel Relating to the Introduction of the Use of Photo-zincography into the Government Printing Department'⁵¹ appeared in the *AJHRs* that year. Due to the pressure of work Vogel had delegated much of the task to his private secretary E. Fox who had produced the paper 'Photo-zincography as Applied at the Ordinance Survey Department, Southampton'.⁵² James Hector's paper on the use of photolithography for reducing the size of maps and plans was also in the report. His interest was in making maps and plans accessible to the general public:

Large and beautifully executed maps, teeming with information, abound in Land and Survey Offices in the colony, which are inaccessible to the public, because they are on too large a scale for handy tracings, and their reduction by hand would not only be expensive but compel the omission of many details. This has been particularly felt in the mining districts, as at the Thames...In the case of plans to be attached to specifications, the use of such an art is obvious, as many copies of the plans could be prepared and distributed to different places where tenders are being called for, instead of requiring all to be referred to one office.⁵³

After his arrival Herbert Deveril had continued his own work as a practising photographer in New Zealand as well as working as a lithographer, and armed with a large format camera when he visited the central North Island, he "recorded scenes of industrial progress in the Colony for the Public Works Department from 1874."⁵⁴ Photographs of Deveril's travelling darkroom van are reproduced in the Hocken Library's 1987 catalogue of his photographs entitled *Herbert Deveril, Photographer*. In 1876, Deveril had produced high quality views of New Zealand and entered some of these in the Philadelphia Exhibition in that year.

In his 1875 paper, *Photo-lithography as Practised at the New Zealand Photo-lithographic Department, Wellington, New Zealand*, Herbert Deveril explained that “the object of photolithography is to reproduce in fac-simile or on a reduced scale, maps, plans, manuscripts &c.,” and reported that by June 1874, just over a year since his appointment, already “690 sheets or sections of originals passed through the office, from which were produced upwards of 200,000 photolithographs, varying in size from octavo royal to 4ft, by 3 ft.”⁵⁵ These items represented work done for a wide variety of departments, including Public Works, the Geological Museum, the Patent Office, the Native, Marine, Defence, Crown Lands, Telegraph and Premier’s departments, the Colonial Architect, Colonial Secretary, and Treasury, as well as the Provincial Government. Deveril’s comparatively high salary (for the times) of £400 per year appeared to be well justified. The Government Printer, George Didsbury, listed achievements made possible by the photolithographic processes in a letter to the Minister for Public Works published in the 1876 *AJHR* as part of the ‘Papers Relating to the Saving Effected by the Photo-lithographic Branch of Government Printing Department’.⁵⁶ Deveril was said to have managed to turn months work into hours work, and savings had been estimated to have been in the order of £2000 a year for the Public Works department alone, while the cost of the Photolithographic Branch amounted to around £600.⁵⁷

That Deveril also had a keen interest in the technical side of the photographic arts is evident from his own paper, in which he describes some of these processes in detail, explaining the advantages and disadvantages. The paper gives an insight into the printing practices of the time that were in use at the GP Office photolithographic department, for instance, the fact that preparation of the two to three inch thick lithographic stones included polishing with pumice and snakestone, and then drying at the fire. It is mentioned that at the time exposures had to be made using sunlight, making the process very dependent on the daily weather. It was not until 1883 that electric light arrived in the GP Office to make light conditions for photography more reliable.

Herbert Deveril the Innovator

In the 1875 paper, Herbert Deveril gives step-by-step instructions concerning the processes used in the GP Office at the time for the production of the photographic negatives, beginning with the instruction to pin the map or plan to the wall before focussing the camera, which ran on a tramway at right angles to the wall, according to the scale wanted. Details are given as to equipment, such as that the glasses used were mostly 16 inch square patent plates. The stipulation that ordinary bromo-iodide of silver photography was not

suitable is explained by the fact that this would not fulfil the requirements for negatives that were “absolutely clear and free from fog in the shadows or lines, and as intense and non-actinic in the lights as possible.”⁵⁸ Deveril reveals a critical attitude to his work, for instance as he explains the reason for his own innovation of flooding the film with gum arabic rather than varnishing. Instead of repeating known processes, Deveril was willing to experiment:

It is found in practice that the gum arabic affords sufficient protection in printing, and enables the glasses to be used over and over again without the difficulties in cleaning which would occur were the negatives varnished.⁵⁹

He further explained that the method of lithographic transfer in use at the GP Office was at the time a method commonly used overseas, characterised by the transference to the stone of the lines in greasy ink, as opposed to the transference of the white parts to the stone in the less commonly used method. In the latter process the lines were left open to absorb the greasy ink. In his paper, there is first a description of the standard method that he was aware was commonly used at the time by the Ordnance Survey at Southhampton, for making the photographically prepared positive plates. The process had been described by Colonel Henry James in his 1859 *Report of the Progress of the Ordnance Survey*:

The paper after being washed over with the solution of bichromate of potash and gum, and dried, is placed in the printing frame under the collodion negative, and after exposure to the light, the whole surface is coated over with lithographic ink, and a stream of hot water then poured over it; and as the portion which was exposed to the light is insoluble, whilst the composition in all the other parts being soluble is easily washed off, we obtain at once the outline of the map in a state ready for being transferred either to stone, zinc, or the copper plate, or we can take the photograph on the zinc at once.⁶⁰

It seems likely that Herbert Deveril had read this report, since his own description of the process closely followed the original account. Deveril however, went on to explain his reasons for *not* using this method:

First, that from the fact of there being no gelatine left on the paper, except that covered by ink, it is impossible, in transferring, to pass the stone more than once through the press, for fear of the transfer shifting and the lines doubling; and secondly, in washing away the unaltered gelatine, that which is left on the lines is apt to be ragged and broken.⁶¹

Deveril then stated that he advocated instead using the process that had been discovered in Melbourne by John Osborne, and which was now practised there, saying that it “obviates these difficulties in an ingenious manner.”

There the gelatine is mixed with albumen, and after the print is coated with transfer ink, it is floated for a few minutes on *boiling water*, which coagulates the albumen, and holds it and the gelatine, or the greater portion of it, fast to the paper, the ink washing away with the aid of a sponge.⁶²

In Osborne’s process, the gelatine was not removed, but was employed to help keep the transfer in place on the stone, and the fact that the unaltered gelatine did not have to be removed from the altered gelatine under the ink as in the Colonel James process prevented the tearing of the ink lines. Deveril commented that “this method was practised here at the commencement of work, but is now discarded.” The reasons he gave were that the boiling water softened the ink, causing it to “gather” on the lines to be printed, giving them a

tendency to “smash” in the transfer process. As well, considering the amount of work to be done, too much boiling water was needed to get rid of all the soluble gelatine. Deveril’s experiments produced modifications that solved these problems, providing definite improvements to Osborne’s process.

Thus both printers in New Zealand and Australia were instrumental in contributing constructive developments to a technical process which later was to be an important foundation for colour printing in the photomechanical era. John Osborne in Melbourne built on early work which he had ascertained through reading the obtainable literature, and Herbert Deveril in Wellington had then made further improvements. However, from the experience of John Osborne, it appears that gaining recognition for advances made in the colonies was difficult, and the lack of support was the reason that he did not pursue his research into the application of photolithography to colour printing on this side of the world, although that had originally been his intention. It had been necessary for him to travel back to the Old World centres of experimentation to pursue his work further.

Detail of Herbert Deveril’s Wellington Modifications

Herbert Deveril described his own innovative improvements in the 1875 paper, together with the advantages, and included detailed instructions for the new process:

Gelatine is soaked, and afterwards dissolved in water over a gas stove, and heated to a temperature of 110deg. Fahr., when a solution of chrome alum is added, well stirred, and the whole strained. Paper is coated with this at a temperature of about 90deg., and is hung up to dry, when it *becomes insoluble, although still capable of absorbing water...* A sun print is taken on this paper in the ordinary manner from the negative, and it is afterwards laid face downwards on a lithographic stone coated with greasy transfer ink, and passed through the press. The surface becomes by this treatment coated with a thin coating of ink. It is next floated for a minute or two, face upwards, on a dish of cold water, and then laid upon a sheet of zinc. The water having been absorbed, through the back of the paper, by those portions of the gelatine not acted upon by light, the ink is readily removed with a wet sponge and a little friction. A few minutes soaking in a dish of clean cold water removes the now useless bi-chromate, and the transfer, being of a clear white, enables any remaining ink to be seen and easily removed. It is now hung up to dry, and is ready for the stone.⁶³

At this point the white portions were still covered with the original coating of insoluble gelatine, which were

yet capable of absorbing a sufficient quantity of water to render them “tacky” when wetted at the back or placed for a few minutes between sheets of damp blotting paper, to adhere firmly to the stone in transferring, and this is of great advantage to the printer as he is not required to deviate from his ordinary method of working...the lines of the transfer are less liable to be ragged and broken than if the were removed from the paper.⁶⁴

Advantages of the new method were the keeping properties of the prepared transfer paper, the fact that the preparation of the paper could be carried out during daylight, any quantity at a time, and that no hot water was needed during the process because the gelatine was already made insoluble in the first place, so that the ink was not softened. That there was no hot and steamy atmosphere was an added bonus. A further advantage was that transfers were easily detached from the stone, and were there to re-use if a stone cracked or if a fresh

transfer was needed. Prints could be dried and stored at the stage where the bichromate had been washed off, and could “at any time be inked and rubbed off, and the resulting transfer be ready in a few minutes.”⁶⁵ Herbert Deveril sent samples of his transfer paper back to England, where they had “yielded excellent transfers.”⁶⁶ It is evident that by his openness to new and better ways of operating the process, Herbert Deveril made considerable improvements to the practise of photolithography, and later the process was further improved and adapted to colour work.

It appears that by the late eighties Herbert Deveril had left his position with the government. In the Wellington Almanac of 1879 he was listed as a photographer, having opened his own photographic studio in Tinakori Road in Wellington, and later premises were in several other Wellington locations. It is interesting, however, that the May 17, 1879 *Mercantile Gazette* listed “a conditional bill of sale of stock-in-trade, plants, goods, chattels etc to the stationer Robert Burrett,” who then expanded his business “to wholesale and manufacturing stationer, lithographer and contractor for the New Zealand Government and North Island Railways.” (See chapter 7.) Although reportedly a successful and artistic photographer, according to newspaper accounts of the day, Herbert Deveril eventually removed to Auckland to again set up in business in 1885, after being declared bankrupt in Wellington.⁶⁷

Towards Photolithographic Colour in New Zealand

As mentioned, Dr. Hector’s report to Parliament in July 1871 on the matter of the information obtained on photolithography in England by Julius Vogel, contained several items besides E. Fox’s report ‘Photo-zincography as Applied at the Ordinance Survey Department, Southampton’. Another item was a letter from Vogel.⁶⁸ Mentioning that samples of photo-zincography were enclosed with Vogel’s letter, Dr Hector had shown an especial interest in something new: the use of the photolithographic process for tonal printing. He said “I observe, among the samples of the art enclosed with Mr Vogel’s letter that there is one in which the great desideratum of copying half-tint shades appears to have been achieved, but no explanation of this modification of the process is given...it is evident that the process might be applied to shaded drawings, and what is still more important, to the copying of natural objects.”⁶⁹ It was not only the printers, but the scientists and those working in the field to originate maps and plans who were interested in developing the graphic processes to practical ends.

By the seventies, the New Zealand General Survey Office was producing colour printed maps, examples of which can be seen in the annual *AJHRs* where they are included as

foldouts. At the Government Printing Office, by 1876 it appears that Herbert Deveril had taken the extra step of using chromolithography to add colour to key outlines printed in black via transfer photolithography, for instance, for the 'Sketch-map of New Zealand North Island Shewing the County Boundaries in Accordance with the Counties Act 1876' which was printed in four colours as well as the outline black, and on which appeared "Photo-lithographed at the Gov^t Printing Office, Wellington, N.Z. by H. Deveril."⁷⁰ The basic photolithographed 'North Island of New Zealand Sketch Map', also bearing the same acknowledgement, had been published in black and white in volume 1 of the 1875 *AJHR*.⁷¹

In the eighteen eighties and nineties, colour printed maps and plans were frequent additions to the *AJHRs*, appearing every year, with many including a specific statement that the basic process that had been used for their production was photolithography. (It is necessary to find such a statement, because it is otherwise almost impossible to tell whether an image has been drawn by hand on transfer paper or drawn on another material and transferred photographically).⁷² For instance, in volume 2 (1879), the map 'Index to the State of the Public Surveys in New Zealand', which was "photo-lithographed by Alex McColl" at the "General Survey Department, Wellington, August 1st, 1879", appeared with a blue lithographed background and red used in combination with symbols to represent four separate informational categories.⁷³ A later example was the map 'New Zealand Lighthouse Chart of General Coast Lights and Principal Harbour Lights' in the second session volume for 1887 on which it was stated "Photo-lithographed at the General Survey Office, Wellington, N.Z., June 1887." The fold-out map had been colour printed in two shades of brown, with the lights standing out in red and yellow, the colours used symbolically according to the key. (Plate 7.) The same year, a report dated 1st July from A. Barron outlined the work undertaken that year for the General Survey Office, in which map printing statistics featured prominently:

The maps prepared and published during the year are : 19 district lithographs on the one-mile scale, 5 sale plans, 28 mining plans and diagrams, 37 book illustrations, 1 harbour chart, 7 electoral maps, and a number of minor plans and diagrams. For the Forest Department 65 drawings have been made, and for the Mines and other departments 16 sketches and designs have been made.

The number of photographic negatives taken is 499, and the number of silver prints is 444. Lithographs and photo-lithographs printed amount to 701,019 from 1,027 diagrams and maps.⁷⁴

At the back of volume 1 from the same year was a 'Plan of National Park Proposed to be Made at Tongariro' that had been "lithographed at the General Survey Office Wellington" in April of that year in black plus four finely striped colours, blue, green, brown, and red, to designate categories of land.

A process for printing maps in colour using transfer lithography was given in *Typo* in 1891:

A map in black may be printed in colors in the following way: Make from the original litho stone as many transfers as you desire colors, and transfer them to the litho stones which are prepared with asphaltum. Those lines which you will wish to print from one stone in one color, you dust in with bronze powder, after which you expose the stone to the sun. The result will be that the exposed parts of the stone become insoluble, while the other parts, protected by the bronze powder, remain soluble. Wash out with turpentine, so that all lines and reading-matter appear light in the brown asphaltum layer. The places which are not to appear in their respective color may be covered by means of a brush with an asphaltum solution, and then the stone may be etched as usual. In this manner the system of lakes, rivers and creeks may be produced in blue, the mountains in brown, and streets and railroad lines in red. After etching the stone it should be oiled and washed out with ether rubbed in with the respective color, and printed as usual.⁷⁵

Plate 7: 'New Zealand Lighthouse Chart of General Coast Lights and Principal Harbour Lights.'

Photolithographed at the General Survey Office, Wellington.

Published in *Appendices to the Journals of the House of Representatives*, 2nd session, 1887, H-4, opp. 26.

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Ref. No.: B-K 535-26.

¹ Geoffrey Wakeman, *Victorian Book Illustration: The Technical Revolution* (Newton Abbot: David & Charles, [1973]), 88.

² *Ibid.*, 89-95.

³ Thomas A. Darragh, 'The Geological Survey of Victoria under Alfred Selwyn, 1852-1868', in *Historical Records of Australian Science*, 7 no.1 (1987): 5.

⁴ The preface by Col. Henry James was written for the handbook *On Photozincography and Other Photographic Processes Employed at the Ordnance Survey Office, Southampton* by Captain A.de C. Scott (Longmans, 1862), reported in Geoffrey Wakeman, *Aspects of Victorian Lithography* (Wymondham: Brewhouse Press, 1970), 44-47.

⁵ Wakeman, *Victorian Book Illustration*, 95.

⁶ Michael Twyman, *Printing 1770-1970: An Illustrated History of its Development and Uses in England* (1970; reprint, with a new foreward by Ruari McLean and an additional bibliography, London: British Library, 1998), 47.

⁷ Gael Newton, *Shades of Light: Photography and Australia 1839-1988*, with essays by Helen Ennis and Chris Long and assistance from Isobel Crombie and Kate Davidson (Canberra: Australian National Gallery; Collins Australia, 1988), 9.

⁸ *Ibid.*, 39.

⁹ R.V. Tooley, *The Mapping of Australia, with an Index Compiled by Douglas Matthews* (London: Holland Press, 1979), 231.

¹⁰ Joan Kerr, ed. *Dictionary of Australian Artists, Painters, Photographers and Engravers to 1870* (Melbourne: Oxford University Press, 1992), 597.

¹¹ Douglas Pike, et al., *Australian Dictionary of Biography*, 12 vols: vols. 1-2: 1788-1850; vols. 3-6: 1851-1890; vols. 7-12: 1891-1939; index (Melbourne: Melbourne University Press, 1966-), 375-376.

¹² Victoria, Paliamentary Papers, 'Photo-lithography. Report of the Board Appointed by the Hon. the President of the Board of Land and Works Together with Evidence Taken before the Board' (Melbourne, Government Printer, 1860-1): 3 no.11, 259-341.

¹³ Victoria, Paliamentary Papers, 'Minutes of Evidence', in 'Photo-lithography', 1.

¹⁴ *Ibid.*, 63-64.

¹⁵ *Ibid.*, 68.

¹⁶ *Ibid.*

¹⁷ Wakeman, *Victorian Book Illustration*, 91.

¹⁸ Victoria, Paliamentary Papers, 'Minutes of Evidence', in 'Photo-lithography', 68.

¹⁹ *Ibid.*, 68.

²⁰ *Ibid.*, 2.

²¹ The preface written by Col. Henry James to the handbook *On Photozincography and Other Photographic Processes Employed at the Ordnance Survey Office, Southampton* by Captain A.de C. Scott, 45-46.

Photolithograph of the General Survey Office Wellington, N.Z. June 1887.

- ²² Victoria, Paliamentary Papers, 'Minutes of Evidence', in 'Photo-lithography', 75.
- ²³ Ibid., 64.
- ²⁴ Ibid.
- ²⁵ Ibid., 59.
- ²⁶ Ibid., 75.
- ²⁷ Ibid.
- ²⁸ Victoria, Paliamentary Papers, 'Photo-lithography. Minutes of Evidence', 5.
- ²⁹ Kerr, ed., *Dictionary of Australian Artists, Painters, Photographers and Engravers to 1870*, 598.
- ³⁰ Victoria, Paliamentary Papers, 'Minutes of Evidence', in 'Photo-lithography', 5.
- ³¹ Ibid., 69.
- ³² Darragh, 'The Geological Survey of Victoria under Alfred Selwyn', 5.
- ³³ Ibid., 6.
- ³⁴ Ibid.
- ³⁵ Ibid., 20: note: "The earliest reference to the use of power presses to print maps in Britain that I can locate is that to the fact that W. and A.R. Johnston in Edinburgh were using such presses by 1860." See W.W. Ristow, 'Lithography and Maps 1796-1850', in *Five Centuries of Map Printing*, ed. David Woodward (Chicago: University of Chicago Press, 1975), 77-112."
- ³⁶ Kerr, ed., *Dictionary of Australian Artists, Painters, Photographers and Engravers to 1870*, 598.
- ³⁷ Pike, et al., *Australian Dictionary of Biography*, 376.
- ³⁸ Tooley, *The Mapping of Australia*, 328.
- ³⁹ David Woodward, *Five Centuries of Map Printing* (Chicago: University of Chicago Press, 1975), 134-135.
- ⁴⁰ A.H. Johnstone, *Canterbury Books, 1847-1955: A Bibliography* ([Christchurch]: Whitcombe & Tombs Ltd., 1956), 18.
- ⁴¹ Map accompanies 'Further Papers Relative to the Native Insurrection', in *Appendices to the Journals of the House of Representatives of New Zealand (AJHR)*, E-1C, 1861. The full title of the map is 'A Map of the North Island of New Zealand Shewing Native and European Territory'.
- ⁴² *Appendices to the Journals of the House of Representatives of New Zealand (AJHR)*, E-23, 1863, tipped in following page 3.
- ⁴³ *AJHR*, E-23, 1863, tipped in between title page and page 1.
- ⁴⁴ Philip Lionel Barton, 'Maori Cartography and the European Encounter', chap. 14 in David and G. Malcolm Lewis, eds., *The History of Cartography* (Chicago: the University of Chicago Press, 1998), vol. 2, bk. 3, 526.
- ⁴⁵ *AJHR*, E-2, 1864.
- ⁴⁶ *AJHR*, E-2, no.9, 1864, tipped in following the memorandum.
- ⁴⁷ John Muir, 'Headpieces and Fairytales: Wellington's Lyon and Blair 1874-1894', unpublished bibliography (Victoria University of Wellington, 1998), 13.
- ⁴⁸ R.A. McKay, ed., *A History of Printing in New Zealand 1830-1940*, 114.
- ⁴⁹ The Hocken Library, *Herbert Deveril, Photographer: A Complete Catalogue of the Photographs by Herbert Deveril in the Hocken Library*, Exhibition (Dunedin, Hocken Library, 1987), 1.
- ⁵⁰ W.A. Glue, *History of the Government Printing Office* (Government Printer, Wellington, 1966), 61.
- ⁵¹ *AJHR*, G-27, 1871, 3-8.
- ⁵² E. Fox, 'Photo-zincography as Applied at the Ordinance Survey Department, Southampton', sub-enclosure to enclosure in no. 1 under the heading 'Information Relating to the Introduction of the Use of Photo-zincography', *AJHR* G-27, 1871, 3-4.
- ⁵³ James Hector, 'Report on the Photo-lithographic Process', no. 2 under the heading 'Information Relating to the Introduction of the Use of Photo-zincography', *AJHR*, G-27, 1871, 7.
- ⁵⁴ Hocken Library, *Herbert Deveril, Photographer*, 2.
- ⁵⁵ Herbert Deveril, *Photolithography as Practised at the New Zealand Government Photo-lithographic Department, Wellington, NZ* (Wellington: Lyon and Blair), 1875, 3. (See Bagnall: 1591.)
- ⁵⁶ See *AJHR*, H-22, 1876, no. 2. Note: George Didsbury was Government Printer from 1865 to 1893.
- ⁵⁷ *AJHR*, H-22, 1876, no. 1 and enclosure in no. 2.
- ⁵⁸ Deveril, *Photolithography as Practised at the New Zealand Government Photo-lithographic Department*, 5.
- ⁵⁹ Ibid., 6.
- ⁶⁰ Wakeman, *Aspects of Victorian Lithography*, 44.
- ⁶¹ Deveril, *Photolithography as Practised at the New Zealand Government Photo-lithographic Department*, 7.
- ⁶² Ibid.
- ⁶³ Ibid., 7-8.
- ⁶⁴ Ibid., 8.
- ⁶⁵ Ibid.
- ⁶⁶ Ibid., 7.

⁶⁷ Hocken Library, *Herbert Deveril, Photographer*, 2: see *Evening Post*, Editorial comment, 2 August, 1880, and *Mercantile and Bankruptcy Gazette*, 17 (4th Nov., 1882).

⁶⁸ *AJHR*, G-27, 1871, 3.

⁶⁹ *AJHR*, G-27, 1871, 7.

⁷⁰ Canterbury Museum, Map Collection, item: CMU166.

⁷¹ *AJHR*, E-3, 1875, opp. 12.

⁷² Bamber Gascoigne, *How to Identify Prints: A Complete Guide to Manual and Mechanical Processes From Woodcut to Ink Jet* (London: Thames and Hudson, 1986), 41a.

⁷³ *AJHR*, 2, 1879: the map follows section H-19, 4. At the bottom left-hand appeared "outline drawn by C.R. Pollen; Writing by F.W. Flanagan; Hills by J.H. Boscawen".

⁷⁴ *AJHR*, second session, C-2, 1887.

⁷⁵ *Typo*, 5 (March 1891): 39.

SECTION III

The Technology: Colour Printing Processes and Equipment

CHAPTER 6.

THE SEEDS OF CHANGE: TOWARDS THE TRANSFORMATION OF COLOUR PRINTING IN NEW ZEALAND

Photomechanical Colour Printing Gathers Pace in New Zealand

The First Tonal Photo-Process Work in New Zealand: Charles Spencer

In New Zealand, it was the private Auckland firm of Charles Spencer that commenced using the high quality, though expensive collotype process for image printing around 1888 for such items as calendars and show-cards,¹ as well as the illustrative work needed for view books.² This marked the beginning of tonal photo-process work in New Zealand, as opposed to the mainly line photolithographic work introduced to New Zealand by Herbert Deveril after his arrival at the Government Printing Office in 1873. The yield from Spencer's collotype plates was limited to about 1000 copies, and these were printed at the rate of about 100 per hour on a hand proofing-press. Later, for general block-making work that included some book illustration, Spencer began to use a swell gelatine process, which has been described in detail by R.A. McKay.³ His apprentice was Milton Vickery. It is interesting that the colour printer A.D. Willis of Wanganui had his own book *Collotype Views of Wanganui River*, which appeared around 1895, collotyped by Charles Spencer. (See Chapter 8.)

Heliotype was another swell gelatine process that had first been developed "apparently independently" in Europe at around the same time as the similar collotype and albertype processes.⁴ In May 1890, R.C. Harding mentioned that he had received some "very fine prints, produced by the heliotype process" from C. Spencer of Tauranga. They included views and two plates representing native shells—illustrative material for a forthcoming work on the subject. Harding considered that "the pictures are produced with all the softness of shade and perfection of detail possessed by the original photograph," and in mentioning that Mr Spencer was "the only artist in the colony who prints by this beautiful process" said that "he should find a good field for his skill", since he was prepared to reproduce any negative sent to him.⁵ Tolla Williment reported that in New Zealand, the heliotype process "was first used for colour printing from a negative in 1890."⁶

As in the northern hemisphere, the linking of the photographic processes with printing began to transform New Zealand printing practice in many spheres. By the mid-eighties, New Zealand printers had begun to use mechanical tints to achieve printed colour more economically, an early example being for the 1887 coloured lithograph 'Ngatapa from the East', showing a pa held by Te Kooti and assaulted by Government forces in 1868-69, that was produced at Henry Brett's Star Steam Printing Company for publication in T.W. Gudgeon's *The Defenders of New Zealand* (1887), and for which prepared tints were partly used to colour a key taken from a pen and ink drawing by J.C. Richmond that had been lithographed in brown, originally around 1869.⁷ Such developments laid the foundation for the further use of the tool of photography to propel colour printing practice in the direction of greater automation, especially towards the development of the three-colour processes that would see the beginnings of new ways to add colour to the printed page in New Zealand. It was to be during the next decade that this revolution occurred, not only overseas, but also in New Zealand, paving the way for twentieth century colour printing.

The 1890s Ferment: New Processes and Practices

At the close of the eighteen eighties, stimulation for printers had come also in the form of the New Zealand and South Seas Exhibition which was held in Dunedin from 1889 to 1890, heralding a decade when new ideas and advances were to change the whole of the printing industry, not only in New Zealand but world-wide. By the nineties, there was much innovative ferment centering on the development of process work for all kinds of pictorial treatment. The use of zinc and copper bases for line and half-tone process engraving was increasing, as methods were by then being transmitted from a variety of places. With so many new processes and inventions in the air, improvements frequently resulted as the various methods were tested and tried. This was also the decade to see much improvement made to layout and design in New Zealand, due to the more imaginative approach being taken by display compositors,⁸ in the wake of the educative approach of the trade journals, not least New Zealand's *Typo*. For instance, in January 1894, in drawing attention to new colour processes, R.C. Harding had picked out and commented on a specimen from Husnik & Häusler's new photochromotype process, a still life in three workings that had been in the *British Printer* for September/October 1893. Harding's assessment was that the product was "equal to ordinary work in from ten to fifteen printings, and is, we feel sure, the color process of the future." To explain he went on:

Professor Husnik, by means of complementary light-filters, secures three negatives of the color-subject, each including the whole of one of the three primaries, whether singly or in combination - thus the negative answering to blue represents all the shades of blue, purple, gray and green in the original. No artificial arrangement approaches the accuracy of selection thus secured. The subjects are etched in relief by what is

known as the single-line process, the lines for each color lying at a different angle. When worked in register, in the pigments most nearly resembling the prismatic primaries, the effect is wonderfully pure.⁹

Ongoing New Zealand Interaction with Australia and Other Places

Increasingly, interaction by way of travel both between Australia and New Zealand and between Australasia and the northern hemisphere was also facilitating professional communication among printers, boosting the propagation of new ideas as knowledge of the latest way of doing things was carried between countries. John Arnold reports that in Australia the 1880s had been “a boom time for the colonial printing industry”, this expansion being “a reflection of the overall development of, and investment in, manufacturing that took place in eastern Australia between 1860 and 1890”. However, by 1890 the Australian printing trade “was still a mixture of industry and craft”¹⁰ with two directions discernable: “one towards the large highly capitalized enterprise, the other following the traditional pattern in the the rise of the small master[printer]”.¹¹

In this atmosphere of diversification and experimentation, occasionally methods that were undergoing revival in other places appear to have been tried by New Zealand colour printers. For example, wood-block colour printing had apparently been tried by Bock and Cousins in Wellington in the later eighties. (See chapter 11.) Much influence continued to come to Australasia from Britain—a wood-block method similar to that used in England by Edmund Evans had also been in use from the early eighteen seventies in Melbourne where William Calvert had established a chromo-typographic printing office to publish cheap children’s books.

In the later nineteenth century printing influence arriving in New Zealand from the northern hemisphere was also increasingly coming from America. Communications networks were becoming faster, and mail links had become available through San Francisco. R.A. McKay has given an outline of some of the key developments and many anecdotes in the chapter, ‘Process-engraving’ in the 1940 *A History of Printing in New Zealand*.¹² (Literature Review: 29.) Notably, it appears that Alexander Sturdivant, back from America in 1896, had brought to New Zealand the copper etching techniques that were to be a great advance from swell-gelatine block-making methods; later he had moved to Tasmania. Apparently Spencer, instantly recognising the value of such an improvement, transferred to the Sydney *Bulletin* for a time where he was able to study such processes at first hand, and on his return to Auckland introduced the methods he had learned for producing both line and half-tone zinc etchings. Because zinc plates were found to be both quicker and more cost effective, their use for general printing in New Zealand began to spread. In the November 1890 issue of

Typo, in reference to volume 4 of the *American Art Printer* which had recently arrived R.C. Harding said:

The first number opens with a very fine half-tone engraving "Winter Evening" etched on copper. The recent discovery by which relief blocks are etched on hitherto intractable metals is of immense importance in art illustration.

He expressed his preference for the quality obtainable from copper as opposed to zinc, saying that he considered it "equal to the most delicate steel-plate work", and commented on the importance for art illustration of the recent overseas advances in metal block etching, citing the portrait of W. Colenso "issued by us in the present year" as an example of current New Zealand metal relief block etching work.¹³ A.A. Smith had commented that "a fair amount of process engraving in the nineties was on copper," but zinc in fact became the metal generally employed for 'process' because it was both cheaper and quicker to use.

In the late nineties, wet-collodion photographic methods were beginning to underpin process-engraving in New Zealand, and were starting to take over from dry-plate methods. In 1897 wet-collodion was first introduced in Christchurch. At Spencers in Auckland, where collodion was produced from gun cotton, nitric acid and ether, the process was also in use.¹⁴ Overseas, printing developments had gathered pace, and the nineties saw such diverse advances as half-tone block printing taking over from wood engraving for the production of colour relief images, the first colour collotypes introduced into Britain, the enrichment of photography with colour, the development of the principles of densitometry and the use of powered intaglio presses for postage stamp printing. Although in New Zealand the economy was depressed, amongst printers the interest was there, and attempting to keep up with these overseas developments to gain market advantage was an economic necessity in the face of increasing competition. At this time, such competition did not facilitate the free trading of information between firms, and experimental processes were often tried in secret and traded at a price. R.A. McKay commented that information was gained from a few textbooks, saying that "both employer and employee studied these so closely that they frequently learned them off by heart".¹⁵

New Methods of Colour Printing in New Zealand

John Taylor and Early Half-tone Block Printing in New Zealand

John Nelson Taylor had come to New Zealand from Melbourne in 1892 to head the lithographic department at Whitcombe and Tombs, first established in Christchurch in 1882 and now the longest surviving New Zealand publishing firm. In *Printing in Canterbury*, A.A. Smith has recounted that Taylor brought with him his experience in the lithographic transfer processes and his expertise in zinc line-block work. In Christchurch he soon

showed his inventive side when he began secret half-tone experiments with a Gloucester Street printer W.J. Edwards, and together they had worked out a ruled screen process. The Christchurch Press Office, having learnt of this, engaged Taylor in August 1893 to introduce ruled screen process work for routine illustrative jobs as a substitute for the very expensive collotype. The Press had bought a collotype plant in the hope that it could be used to produce illustrations for the *Weekly Press*. It is interesting to note that the lithographer/photographer who had been engaged to operate the plant was Frederick Sears who was involved in later experimentation to advance the lithographic processes. Unfortunately collotype had proved to be unsuited to the task of providing illustrations for a newspaper with a large circulation because it was too slow. This had been a double blow, since "a large sum" of money had been paid for the "secret" of the process, and as well it turned out that all along it had been "available in a book costing only a few shillings."¹⁶

However, the success of the new half-tone methods enabled illustrative work to be undertaken in a cost-effective way for the *Weekly Press*. A.A. Smith states that, by using etched half-tone block techniques, the *Press* made a significant step in 1894 to become the first New Zealand newspaper with the ability to use photographic illustrations on a regular weekly basis.¹⁷ The New Zealand weekly, the Auckland *Graphic* had also been innovative in this field and had featured half-tone images in its annual Christmas supplements at least from 1893 onwards. (See Chapter 10.) R.A. McKay recounted that John Taylor's son William later recalled that in those early times his father sometimes had to be pro-active to fine-tune the procedural detail needed to tackle a new process. R.A. McKay said that he had cited a "distinct recollection of the first experimental half-tone screen he secured: he paid an American a fair sum to be told if the screen went in front of the camera or where."¹⁸

The general atmosphere of secrecy among printers around early process work in New Zealand was said by the Wellington printer C. Moore to be a 'Keep-it-Dark-System'. Moore, who had also worked on an illustrated weekly, was not able to produce half-tone illustrations in 1899, due to the lack of electric light. In the meantime, line-work had to suffice, for which printing onto metal via the albumen method and then rolling up with transfer ink was used. However, early combination lithographic and black and white half-tone processes were also beginning to be tried, for instance, at the Christchurch Press Office, and simplified three-colour lithography, not yet tri-chromatic lithographic halftone, was appearing around 1897 just before the introduction of true half-tone colour printing in New Zealand.

First New Zealand Tri-chromatic Printing in Christchurch

As had been the case throughout the history of colour printing, it was often due the presence of innovative and talented individuals that the cause of printing in colours was furthered through the exploration and extension of an existing process, albeit surrounded by the contemporaneous experimentation of others. This was true of the introduction of the first three-colour half-tone printing into New Zealand. In the last years of the nineteenth century, William A. Taylor took his father's work forward in Christchurch, eventually making the breakthrough to produce three-colour half-tones from zinc engraved blocks. According to A.A. Smith, this feat happened to be for a job requiring colour printing for an artist's catalogue produced by the Christchurch firm of Alexander Wildey and Company in 1898:

The production of the first three-colour half-tones made in New Zealand was the work of W.A. Taylor, a son of J.N. Taylor. This was in 1898. It was for an artists' catalogue produced by Alex. Wildey and Company Limited, of Christchurch.¹⁹

William Taylor was a New Zealand-trained printer who had served a seven year apprenticeship beginning around 1896 at the Christchurch Press Company. During the time of his apprenticeship, fresh process experience had also come to that firm from London when around the turn of the century "a Mr. F.N. Carr joined the staff direct from Carl Henschel Ltd."²⁰

Around the same time that Taylor's work appeared in production, printing from tri-chromatic process blocks to produce full-page colour supplements for the *New Zealand Wheelman* was also accomplished by Alexander Wildey, who apparently used three colour blocks that had been made at the Christchurch Photo Engraving Company by Ernest Moss in 1896 and 1897 for the task:

The first three-colour half-tone blocks made in New Zealand were printed by Alex. Wildey, principal of Alex. Wildey Limited. These blocks appeared as a series of full-page supplements in the *New Zealand Wheelman*. The blocks were made by the late Ernest Moss, of the Christchurch Photo Engraving Company, in 1896 and 1897.²¹

A.A. Smith recounts that Wildey had worked first in Napier and Lawrence before moving to Christchurch where he had become letterpress foreman at Whitcombe and Tombs, before going into business on his own account in 1894. Having "a flair for journalism," from 1892 he had printed and published the successful *New Zealand Wheelman*, the first southern hemisphere cycling journal. The exact publication date was not given for the colour supplements, but from a search of the apparently only remaining (broken) New Zealand run of this journal (held in Canterbury Public Library) from around this time, it appears they have not survived. Wildey was an innovative man, and had also been a pioneer in other fields. Together with George Mitchell, he had considered many inventive plans, including ideas for new coloured inks:

Alex. Wildey's firm was also responsible for the first multi-colour transfers for bicycles and for trade marks, and it made the first cigarette cartons produced in Christchurch. Many new ideas were put before Alex. Wildey by the late George Mitchell. Among them were the 'Wetter' numbering machines, and bronze blue and bronze red inks. Alex. Wildey introduced the first roll and flat automatic ticket printing machine.²²

An unsigned article in the December 1947 issue of *Invicta News* states that H. Gamble "is credited with the production of the first New Zealand trichromatic blocks"²³ but does not say who credits, or when or where such blocks were produced. An unpublished typescript, *The History of Otago Printing 1849-1937*, attributed to John Gregory and R.V.S. Perry, also has similar information to the *Invicta News* article. Held in the Hocken Library, this undated typescript refers the reader to the source of that particular part of the history as being R.A. McKay, and states "Mr. H. Gamble first made three-colour blocks."²⁴ This may refer to the first trichromatic blocks in Dunedin, as the relevant passage in McKay mentions his plans for tri-chromatic printing, although rather vaguely, in connection with lithographic rather than relief block printing:

Three-colour half-tone zinc engravings were made in Christchurch by Mr. W.A. Taylor in 1898 - the first in New Zealand. Mr. Moss of the Christchurch Engraving Company also made three-colour process blocks at about this time. After the *Press* was well established in process work, the *Lyttelton Times* started off under Mr. H. Gamble of Wellington...It is interesting to note that one of the early workers in the *Daily Times* was Mr H. Gamble (McKee and Gamble, Wellington). Mr. Gamble appears in the early days of process work in each of the four centres. He did not stay long with the *Daily Times*, however, and left in 1901 to start a business of his own in Dunedin. He had some scheme for doing three-colour work on the stone and sold out his plant in 1906 or 1907, leaving Dunedin to try and get his ideas taken up in America or England.²⁵

Knowledge and plant for process work in these pioneering times was sometimes being acquired by New Zealand printers in Australia, as A. Chisman from Dunedin had done in the late nineties when he had transferred to Sydney to receive training in process work in 1898, after realising that although he had imported the necessary plant, also from Sydney, it was process knowledge that he lacked.²⁶

As was being pointed out at the time by writers in the *Penrose Annual*, one of the early problems for tri-chromatic printing lay in obtaining the purity of hue that was crucial to the success of the process in the basic coloured inks. For example, in an 1897 article C.G. Zander, who was Manager of the Colour Department at the British firm of A.B. Fleming and Co. Ltd.,²⁷ defined improvements that were needed at the time to perfect tri-chromatic printing, stressing that the inks needed to be both transparent and permanent, difficulties with many. He said that, even although firms with a good understanding of the requirements for three colour printing could by then produce inks of the so-called primary pigment colours "fairly closely", they could not yet be called absolutely correct.²⁸ This was corroborated by William Taylor, who is recorded by A.A. Smith as stating that in those early days of the process, general conditions were still trying, and that the Canterbury printers "had considerable difficulty in attaining strictly neutral, yellow, blue and red

inks.”²⁹ An early tri-chromatic half-tone print that was produced in Auckland was published in the ‘Coronation Supplement’ issued with the *Auckland Weekly News* for Thursday June 19th 1902. It was an image of the newly crowned King, ‘His Majesty King Edward VII’. (See chapter 10.) Just a few years later, a colour print from the *Auckland Weekly News* was chosen to appear in the *Penrose Annual* of 1905/06. Entitled ‘A Maori Maiden’, it had also been printed from “three-colour blocks”. (Plate 8.) An example of three colour printing from Britain, published in the 1903/04 volume of the *Penrose Annual* around that time was ‘Time Study of a Head’ contributed by the students of the Tri-colour class of the London Bolt Court School. (Plate 9.)

A Key Change: Electricity

In the *Government Printing Office Report for 1886*, it was mentioned that “two of the composing rooms in the new Printing Office are lighted with electric lamps.”³⁰ It appears that electric light, which gave better illumination and was cheaper, had first been installed in that establishment in May 1883.³¹ Because electric light was not in general use in New Zealand until the late nineteenth century, as mentioned, the difficulty that remained for process work was that it was dependent on fine weather to allow the photographic exposures to be made in good light. This would often mean carrying frames up onto roof areas, where waiting for right conditions often held up the printers “when the formes were ready made up and the machine waiting”.³² The lack of electric light was the limiting factor that delayed the use of half-tone methods in many places. By the eighties, experimentation had resulted in the use of carbon arc lighting, making the lighting conditions needed for these processes more easily controllable, but over the last two decades of the century, electric light gradually replaced gas lighting, and this was a boon to the photography which was essential to photomechanical printing, allowing it to become an indoor process that was not dependent on sunlight. Thus towards the end of the century the coming of electric light had been beneficial not only for compositors, but also gave photomechanical processes a boost. Over the last part of the nineteenth century, as photomechanical processes took root

Plate 8: ‘A Maori Maiden.’ With border representing a piece of Maori carving.

Three-colour blocks by the *Auckland Weekly News*. N.Z. Creator: C. Kingsley-Smith.

Published in *Penrose’s Pictorial Annual: An Illustrated Review of the Graphic Arts*, 11 (1905/06): opp.100, plate 8.

By permission of the Alexander Turnbull Library, Wellington, N.Z., New Zealand and Pacific Collection.
Ref. No.: S-L 478-100.

Plate 9: ‘Time Study of a Head.’ Tri-colour process reproduction by the students of the tri-colour class of Bolt Court School. From a sketch in oil colours by T.J. Reindorp.

Published in *The Process Year Book*, 1903/04, foll. 40.

Held: Victoria University of Wellington Library.

A MAORI MAIDEN

Illustration of a Maori Maiden

By the artist of the Maori Carving

Portrait of an old woman

Portrait of an old woman

Portrait of an old woman

and became established, image-making possibilities in all three major printing techniques, relief, intaglio and lithography had made significant advances in the northern hemisphere. This paved the way for the transformation of colour printing from a heavy reliance on the art processes that were executed by hand to being dependent on more automated methods and those that involved the chemical photographic processes that were gradually becoming more scientifically controllable. The revision of work to exclude the engraver as translator of the artist's work to the printing surface had brought the newer skill of process engraving to the fore. At the same time, the transformation was freeing the artist from his shackles as sole provider of verisimilitude; the camera was taking on that role, but not yet for colour. Reporting in 1894 that William Morris had forecast that printing would last another fifty years or "one hundred at the most," the New Zealander R.C. Harding reflected that by its nature invention takes sudden and unforeseen directions, and that for instance photography, once a scientific recreation, had become indispensable in every branch of graphics...that the world as a whole would gain; but that the inexorable law of progress holds good – the gain is costly, involving irretrievable loss:

The young man at the close of his term finds the art a different one from that to which he was apprenticed. Machines, methods, and designs become old-fashioned or even obsolete at a rate undreamed of a few years ago...During the present generation, more original and improved machines, more designs in type, and more new processes have been introduced than during the previous four centuries...when Nicéphore Niépce experimented on the curious action of light upon bitumen, he did not suspect that he had chanced upon a discovery that would in fifty years kill the beautiful arts of line engraving and xylography. It was not that the new arts were better, though they developed artistic possibilities of their own; but direct handiwork on wood and copper had to give way to cheap and ready chemical processes...An age "steam and devil-driven" as Ruskin has put it, could brook no delay. The hand-press has gone.³³

Into the Twentieth Century ***Antipodean Process Work***

By the late eighteen nineties the British Penrose Company, which was selling process equipment and so had an interest in helping to bridge the knowledge gap for Antipodean printers, was sending commercial travellers around the world, including to Australasia. Sometimes their reports on the state of colonial printing affairs appeared in the *Penrose Annual*. The Penrose traveller Frank Middows had come to New Zealand from Sydney, and in the 1901/02 volume he had contributed the article 'Process Work at the Antipodes', his assessment being that "Process work in Australia and New Zealand still continues to make steady progress." Special mention was made of the standard of tri-chromatic printing in these colonies:

3-colour work is moving ahead and the work that is now being turned out shows a marked improvement over that of last year. It is arousing a considerable amount of interest amongst illustrated newspaper proprietors in view of its suitability for coloured supps.³⁴

The report for 1904/05 confirmed that by this time process work was well established in Australasia:

3-colour work is making steady progress both in quality and quantity and is now in fair demand for newspaper supplements, calendars, viewbooks, post-cards, etc. The printing of this class of work has vastly improved of late, and the public readily appreciates work of this description; three-colour blocks made in Australia will compare very favourably with those turned out by the best English houses.³⁵

An example of trichromatic printing from half-tone blocks by the Penrose Company itself adorned the cover of the 1905-06 *Penrose Annual*. Middows also commented that he foresaw that new skills associated with the further employment of colour relief half-tone printing would be required in the colonies, saying that although labour appeared to be well supplied at that time, “as soon as fine etching comes into more general use there should be occasional opportunities for experts in this direction....”.³⁶ In his 1904/05 report, Middows mentioned that there were limited openings for those who could work innovatively with new colour work tools, such as the airbrush, and those who were familiar with drawing for process reproduction. Such travellers were in touch with printers in both hemispheres, and were able to assist and assess, helping Antipodean printers to keep up with the state of the art technologically. As they were facilitating the faster uptake of new processes in the colonies, at the same time they were establishing and furthering business for the Penrose Company in their role as printers’ suppliers. By the middle of the first decade of the twentieth century, in both Britain and New Zealand, attempts were being made to improve tri-chromatic printing in the direction that it would eventually largely go—with the addition of a black printing to improve the overall colour contrast. Some early attempts at such printing in the commercial arena can be seen on examination of the colour printing executed at around this time in conjunction with some of the weeklies such as the *New Zealand Graphic*. (See chapter 10.) Four colour process had been under investigation since around the beginning of the eighteen nineties by the German lithographer Ulrich, who had obtained promising results by adding a greyish tint to three-colour process printing.³⁷

As commercial colour process printing gained ground, the older art chromolithographic processes continued to be used commercially side by side to beyond the end of the study period, but a more definite divergence was taking place between commercial and individual art pursuits. Indicative of this trend is the fact that it was not until after 1904 that the older intaglio printmaking process of mezzotint appeared in New Zealand, but by this time, such an appearance was only feasible in the hands of an artist printmaker, and in this case had been chosen for use by A.J. Rae of Timaru. (See chapter 11: 469.)

A New Zealand Inventor Assists 20th Century Colour Printing

The Beginnings of Offset Printing

One of the problems that had faced commercial lithographic printers was that of the rigidity of the stone: it was not easily adaptable to rotary printing. In the northern hemisphere, the

beginnings of one solution had come in the form of experimentation in offset methods, and in 1875, Robert Barclay of London had begun offset printing on tin, whereby the image from the stone was first taken on cardboard mounted on a cylinder, and then transferred to the tin sheet. This process was then modified to substitute a rubber-coated canvas as the offset blanket, and after this metal box makers used the method for the decoration of their wares. Although the real break-through that allowed high-speed lithographic rotary printing had waited until the early twentieth century, a paragraph from the *American Lithographer and Printer* was reported in the May 1887 issue of *Typo* indicating that by then a steam press had been invented for offset, and that the process was being used for colour printing.

Printing on Tinfoil – The impression is at first made from the stone onto a rubber roller and from this roller the ink is rolled or transferred off again upon the tin-plate. There has lately been invented a steam press, which we think has also been patented. This press is working in the same plan, and the main principle is that the rubber has the qualification of taking a much sharper impression than any kind of paper in the market, and by its elasticity has also the nature of printing smooth and solid on a hard surface, even if the same is uneven. If the ink becomes too hard, by printing several colors on top of each other, add to the first color you print a trifle of yellow wax with venetian turpentine. This will prevent the trouble, and the ink will lift readily.³⁸

Mainly on the continent, ‘process’ had been applied to lithographic printing to yield several colour printing methods such as Photostone, Photochrom, the Frey process, and others. Michael Twyman has commented that the eventual adaptation of offset lithography to print (on paper) from metal that could be sleeved onto a rotary machine was the invention that was to give lithographic printing a “tremendous boost,”³⁹ and at the same time helped to solve this problem. It was in New Zealand that Frederick Sears worked on an invention that was of importance to the later development of the photo-offset process which helped to make such lithographic colour printing more commercially viable, although he had found it necessary to return to the northern hemisphere to pursue this work. R.A. McKay mentioned that Henry Gamble, who had been influential in early New Zealand process work, had also left the country and travelled to the northern hemisphere in order to further an interest in experimental tri-chromatic lithographic process work, and that

the firm of Coulls, Culling Ltd....bought Gamble’s plant and that was their entry into the ranks of the process-engravers.⁴⁰

The pattern emerging was one of reverse migration in the case of those New Zealanders wishing to contribute to main-stream research and development.

Frederick Sears and Offset Lithography

Frederick Sears wrote about his process in the *Penrose Annual* in a 1908/09 article entitled ‘Alzinography: Lithography of the Future’. Sears’ innovation was to help to lay the foundation for the modern photomechanical lithographic process that was to become a dominant printing method in twentieth century printing far beyond the period under study. His was the visionary process, which at first he referred to as the ‘High Light Process’, that

became viable in tandem with the press developed for rubber blanket offset printing by the American Ira Rubel, whom Sears met in London around 1905, the year in which the press was first constructed. Like his predecessor Herbert Deveril, Frederick Sears was a photographer, and also had been employed for a time in the Lithographic Branch in Wellington, but, as mentioned by W.A. Glue, his invention had been made in his spare time:

Mr Sears set up an experimental plant at his home and spent his spare time developing an improved method of lithography using photographic exposures. At first he called his process the High Light process, but after later improvements in America he gave it the name *Alzinography*, or, lithography of the future.⁴¹

During the eight and a half years that Sears was in Government employment in New

Zealand, Sears, I., 1884-1903, D., 1903-1911, 1911-1914, 1914-1917, 1917-1921, 1921-1924, 1924-1927, 1927-1930, 1930-1933, 1933-1936, 1936-1939, 1939-1942, 1942-1945, 1945-1948, 1948-1951, 1951-1954, 1954-1957, 1957-1960, 1960-1963, 1963-1966, 1966-1969, 1969-1972, 1972-1975, 1975-1978, 1978-1981, 1981-1984, 1984-1987, 1987-1990, 1990-1993, 1993-1996, 1996-1999, 1999-2002, 2002-2005, 2005-2008, 2008-2011, 2011-2014, 2014-2017, 2017-2020, 2020-2023, 2023-2026, 2026-2029, 2029-2032, 2032-2035, 2035-2038, 2038-2041, 2041-2044, 2044-2047, 2047-2050, 2050-2053, 2053-2056, 2056-2059, 2059-2062, 2062-2065, 2065-2068, 2068-2071, 2071-2074, 2074-2077, 2077-2080, 2080-2083, 2083-2086, 2086-2089, 2089-2092, 2092-2095, 2095-2098, 2098-2101, 2101-2104, 2104-2107, 2107-2110, 2110-2113, 2113-2116, 2116-2119, 2119-2122, 2122-2125, 2125-2128, 2128-2131, 2131-2134, 2134-2137, 2137-2140, 2140-2143, 2143-2146, 2146-2149, 2149-2152, 2152-2155, 2155-2158, 2158-2161, 2161-2164, 2164-2167, 2167-2170, 2170-2173, 2173-2176, 2176-2179, 2179-2182, 2182-2185, 2185-2188, 2188-2191, 2191-2194, 2194-2197, 2197-2200, 2200-2203, 2203-2206, 2206-2209, 2209-2212, 2212-2215, 2215-2218, 2218-2221, 2221-2224, 2224-2227, 2227-2230, 2230-2233, 2233-2236, 2236-2239, 2239-2242, 2242-2245, 2245-2248, 2248-2251, 2251-2254, 2254-2257, 2257-2260, 2260-2263, 2263-2266, 2266-2269, 2269-2272, 2272-2275, 2275-2278, 2278-2281, 2281-2284, 2284-2287, 2287-2290, 2290-2293, 2293-2296, 2296-2299, 2299-2302, 2302-2305, 2305-2308, 2308-2311, 2311-2314, 2314-2317, 2317-2320, 2320-2323, 2323-2326, 2326-2329, 2329-2332, 2332-2335, 2335-2338, 2338-2341, 2341-2344, 2344-2347, 2347-2350, 2350-2353, 2353-2356, 2356-2359, 2359-2362, 2362-2365, 2365-2368, 2368-2371, 2371-2374, 2374-2377, 2377-2380, 2380-2383, 2383-2386, 2386-2389, 2389-2392, 2392-2395, 2395-2398, 2398-2401, 2401-2404, 2404-2407, 2407-2410, 2410-2413, 2413-2416, 2416-2419, 2419-2422, 2422-2425, 2425-2428, 2428-2431, 2431-2434, 2434-2437, 2437-2440, 2440-2443, 2443-2446, 2446-2449, 2449-2452, 2452-2455, 2455-2458, 2458-2461, 2461-2464, 2464-2467, 2467-2470, 2470-2473, 2473-2476, 2476-2479, 2479-2482, 2482-2485, 2485-2488, 2488-2491, 2491-2494, 2494-2497, 2497-2500, 2500-2503, 2503-2506, 2506-2509, 2509-2512, 2512-2515, 2515-2518, 2518-2521, 2521-2524, 2524-2527, 2527-2530, 2530-2533, 2533-2536, 2536-2539, 2539-2542, 2542-2545, 2545-2548, 2548-2551, 2551-2554, 2554-2557, 2557-2560, 2560-2563, 2563-2566, 2566-2569, 2569-2572, 2572-2575, 2575-2578, 2578-2581, 2581-2584, 2584-2587, 2587-2590, 2590-2593, 2593-2596, 2596-2599, 2599-2602, 2602-2605, 2605-2608, 2608-2611, 2611-2614, 2614-2617, 2617-2620, 2620-2623, 2623-2626, 2626-2629, 2629-2632, 2632-2635, 2635-2638, 2638-2641, 2641-2644, 2644-2647, 2647-2650, 2650-2653, 2653-2656, 2656-2659, 2659-2662, 2662-2665, 2665-2668, 2668-2671, 2671-2674, 2674-2677, 2677-2680, 2680-2683, 2683-2686, 2686-2689, 2689-2692, 2692-2695, 2695-2698, 2698-2701, 2701-2704, 2704-2707, 2707-2710, 2710-2713, 2713-2716, 2716-2719, 2719-2722, 2722-2725, 2725-2728, 2728-2731, 2731-2734, 2734-2737, 2737-2740, 2740-2743, 2743-2746, 2746-2749, 2749-2752, 2752-2755, 2755-2758, 2758-2761, 2761-2764, 2764-2767, 2767-2770, 2770-2773, 2773-2776, 2776-2779, 2779-2782, 2782-2785, 2785-2788, 2788-2791, 2791-2794, 2794-2797, 2797-2800, 2800-2803, 2803-2806, 2806-2809, 2809-2812, 2812-2815, 2815-2818, 2818-2821, 2821-2824, 2824-2827, 2827-2830, 2830-2833, 2833-2836, 2836-2839, 2839-2842, 2842-2845, 2845-2848, 2848-2851, 2851-2854, 2854-2857, 2857-2860, 2860-2863, 2863-2866, 2866-2869, 2869-2872, 2872-2875, 2875-2878, 2878-2881, 2881-2884, 2884-2887, 2887-2890, 2890-2893, 2893-2896, 2896-2899, 2899-2902, 2902-2905, 2905-2908, 2908-2911, 2911-2914, 2914-2917, 2917-2920, 2920-2923, 2923-2926, 2926-2929, 2929-2932, 2932-2935, 2935-2938, 2938-2941, 2941-2944, 2944-2947, 2947-2950, 2950-2953, 2953-2956, 2956-2959, 2959-2962, 2962-2965, 2965-2968, 2968-2971, 2971-2974, 2974-2977, 2977-2980, 2980-2983, 2983-2986, 2986-2989, 2989-2992, 2992-2995, 2995-2998, 2998-3001, 3001-3004, 3004-3007, 3007-3010, 3010-3013, 3013-3016, 3016-3019, 3019-3022, 3022-3025, 3025-3028, 3028-3031, 3031-3034, 3034-3037, 3037-3040, 3040-3043, 3043-3046, 3046-3049, 3049-3052, 3052-3055, 3055-3058, 3058-3061, 3061-3064, 3064-3067, 3067-3070, 3070-3073, 3073-3076, 3076-3079, 3079-3082, 3082-3085, 3085-3088, 3088-3091, 3091-3094, 3094-3097, 3097-3100, 3100-3103, 3103-3106, 3106-3109, 3109-3112, 3112-3115, 3115-3118, 3118-3121, 3121-3124, 3124-3127, 3127-3130, 3130-3133, 3133-3136, 3136-3139, 3139-3142, 3142-3145, 3145-3148, 3148-3151, 3151-3154, 3154-3157, 3157-3160, 3160-3163, 3163-3166, 3166-3169, 3169-3172, 3172-3175, 3175-3178, 3178-3181, 3181-3184, 3184-3187, 3187-3190, 3190-3193, 3193-3196, 3196-3199, 3199-3202, 3202-3205, 3205-3208, 3208-3211, 3211-3214, 3214-3217, 3217-3220, 3220-3223, 3223-3226, 3226-3229, 3229-3232, 3232-3235, 3235-3238, 3238-3241, 3241-3244, 3244-3247, 3247-3250, 3250-3253, 3253-3256, 3256-3259, 3259-3262, 3262-3265, 3265-3268, 3268-3271, 3271-3274, 3274-3277, 3277-3280, 3280-3283, 3283-3286, 3286-3289, 3289-3292, 3292-3295, 3295-3298, 3298-3301, 3301-3304, 3304-3307, 3307-3310, 3310-3313, 3313-3316, 3316-3319, 3319-3322, 3322-3325, 3325-3328, 3328-3331, 3331-3334, 3334-3337, 3337-3340, 3340-3343, 3343-3346, 3346-3349, 3349-3352, 3352-3355, 3355-3358, 3358-3361, 3361-3364, 3364-3367, 3367-3370, 3370-3373, 3373-3376, 3376-3379, 3379-3382, 3382-3385, 3385-3388, 3388-3391, 3391-3394, 3394-3397, 3397-3400, 3400-3403, 3403-3406, 3406-3409, 3409-3412, 3412-3415, 3415-3418, 3418-3421, 3421-3424, 3424-3427, 3427-3430, 3430-3433, 3433-3436, 3436-3439, 3439-3442, 3442-3445, 3445-3448, 3448-3451, 3451-3454, 3454-3457, 3457-3460, 3460-3463, 3463-3466, 3466-3469, 3469-3472, 3472-3475, 3475-3478, 3478-3481, 3481-3484, 3484-3487, 3487-3490, 3490-3493, 3493-3496, 3496-3499, 3499-3502, 3502-3505, 3505-3508, 3508-3511, 3511-3514, 3514-3517, 3517-3520, 3520-3523, 3523-3526, 3526-3529, 3529-3532, 3532-3535, 3535-3538, 3538-3541, 3541-3544, 3544-3547, 3547-3550, 3550-3553, 3553-3556, 3556-3559, 3559-3562, 3562-3565, 3565-3568, 3568-3571, 3571-3574, 3574-3577, 3577-3580, 3580-3583, 3583-3586, 3586-3589, 3589-3592, 3592-3595, 3595-3598, 3598-3601, 3601-3604, 3604-3607, 3607-3610, 3610-3613, 3613-3616, 3616-3619, 3619-3622, 3622-3625, 3625-3628, 3628-3631, 3631-3634, 3634-3637, 3637-3640, 3640-3643, 3643-3646, 3646-3649, 3649-3652, 3652-3655, 3655-3658, 3658-3661, 3661-3664, 3664-3667, 3667-3670, 3670-3673, 3673-3676, 3676-3679, 3679-3682, 3682-3685, 3685-3688, 3688-3691, 3691-3694, 3694-3697, 3697-3700, 3700-3703, 3703-3706, 3706-3709, 3709-3712, 3712-3715, 3715-3718, 3718-3721, 3721-3724, 3724-3727, 3727-3730, 3730-3733, 3733-3736, 3736-3739, 3739-3742, 3742-3745, 3745-3748, 3748-3751, 3751-3754, 3754-3757, 3757-3760, 3760-3763, 3763-3766, 3766-3769, 3769-3772, 3772-3775, 3775-3778, 3778-3781, 3781-3784, 3784-3787, 3787-3790, 3790-3793, 3793-3796, 3796-3799, 3799-3802, 3802-3805, 3805-3808, 3808-3811, 3811-3814, 3814-3817, 3817-3820, 3820-3823, 3823-3826, 3826-3829, 3829-3832, 3832-3835, 3835-3838, 3838-3841, 3841-3844, 3844-3847, 3847-3850, 3850-3853, 3853-3856, 3856-3859, 3859-3862, 3862-3865, 3865-3868, 3868-3871, 3871-3874, 3874-3877, 3877-3880, 3880-3883, 3883-3886, 3886-3889, 3889-3892, 3892-3895, 3895-3898, 3898-3901, 3901-3904, 3904-3907, 3907-3910, 3910-3913, 3913-3916, 3916-3919, 3919-3922, 3922-3925, 3925-3928, 3928-3931, 3931-3934, 3934-3937, 3937-3940, 3940-3943, 3943-3946, 3946-3949, 3949-3952, 3952-3955, 3955-3958, 3958-3961, 3961-3964, 3964-3967, 3967-3970, 3970-3973, 3973-3976, 3976-3979, 3979-3982, 3982-3985, 3985-3988, 3988-3991, 3991-3994, 3994-3997, 3997-4000, 4000-4003, 4003-4006, 4006-4009, 4009-4012, 4012-4015, 4015-4018, 4018-4021, 4021-4024, 4024-4027, 4027-4030, 4030-4033, 4033-4036, 4036-4039, 4039-4042, 4042-4045, 4045-4048, 4048-4051, 4051-4054, 4054-4057, 4057-4060, 4060-4063, 4063-4066, 4066-4069, 4069-4072, 4072-4075, 4075-4078, 4078-4081, 4081-4084, 4084-4087, 4087-4090, 4090-4093, 4093-4096, 4096-4099, 4099-4102, 4102-4105, 4105-4108, 4108-4111, 4111-4114, 4114-4117, 4117-4120, 4120-4123, 4123-4126, 4126-4129, 4129-4132, 4132-4135, 4135-4138, 4138-4141, 4141-4144, 4144-4147, 4147-4150, 4150-4153, 4153-4156, 4156-4159, 4159-4162, 4162-4165, 4165-4168, 4168-4171, 4171-4174, 4174-4177, 4177-4180, 4180-4183, 4183-4186, 4186-4189, 4189-4192, 4192-4195, 4195-4198, 4198-4201, 4201-4204, 4204-4207, 4207-4210, 4210-4213, 4213-4216, 4216-4219, 4219-4222, 4222-4225, 4225-4228, 4228-4231, 4231-4234, 4234-4237, 4237-4240, 4240-4243, 4243-4246, 4246-4249, 4249-4252, 4252-4255, 4255-4258, 4258-4261, 4261-4264, 4264-4267, 4267-4270, 4270-4273, 4273-4276, 4276-4279, 4279-4282, 4282-4285, 4285-4288, 4288-4291, 4291-4294, 4294-4297, 4297-4300, 4300-4303, 4303-4306, 4306-4309, 4309-4312, 4312-4315, 4315-4318, 4318-4321, 4321-4324, 4324-4327, 4327-4330, 4330-4333, 4333-4336, 4336-4339, 4339-4342, 4342-4345, 4345-4348, 4348-4351, 4351-4354, 4354-4357, 4357-4360, 4360-4363, 4363-4366, 4366-4369, 4369-4372, 4372-4375, 4375-4378, 4378-4381, 4381-4384, 4384-4387, 4387-4390, 4390-4393, 4393-4396, 4396-4399, 4399-4402, 4402-4405, 4405-4408, 4408-4411, 4411-4414, 4414-4417, 4417-4420, 4420-4423, 4423-4426, 4426-4429, 4429-4432, 4432-4435, 4435-4438, 4438-4441, 4441-4444, 4444-4447, 4447-4450, 4450-4453, 4453-4456, 4456-4459, 4459-4462, 4462-4465, 4465-4468, 4468-4471, 4471-4474, 4474-4477, 4477-4480, 4480-4483, 4483-4486, 4486-4489, 4489-4492, 4492-4495, 4495-4498, 4498-4501, 4501-4504, 4504-4507, 4507-4510, 4510-4513, 4513-4516, 4516-4519, 4519-4522, 4522-4525, 4525-4528, 4528-4531, 4531-4534, 4534-4537, 4537-4540, 4540-4543, 4543-4546, 4546-4549, 4549-4552, 4552-4555, 4555-4558, 4558-4561, 4561-4564, 4564-4567, 4567-4570, 4570-4573, 4573-4576, 4576-4579, 4579-4582, 4582-4585, 4585-4588, 4588-4591, 4591-4594, 4594-4597, 4597-4600, 4600-4603, 4603-4606, 4606-4609, 4609-4612, 4612-4615, 4615-4618, 4618-4621, 4621-4624, 4624-4627, 4627-4630, 4630-4633, 4633-4636, 4636-4639, 4639-4642, 4642-4645, 4645-4648, 4648-4651, 4651-4654, 4654-4657, 4657-4660, 4660-4663, 4663-4666, 4666-4669, 4669-4672, 4672-4675, 4675-4678, 4678-4681, 4681-4684, 4684-4687, 4687-4690, 4690-4693, 4693-4696, 4696-4699, 4699-4702, 4702-4705, 4705-4708, 4708-4711, 4711-4714, 4714-4717, 4717-4720, 4720-4723, 4723-4726, 4726-4729, 4729-4732, 4732-4735, 4735-4738, 4738-4741, 4741-4744, 4744-4747, 4747-4750, 4750-4753, 4753-4756, 4756-4759, 4759-4762, 4762-4765, 4765-4768, 4768-4771, 4771-4774, 4774-4777, 4777-4780, 4780-4783, 4783-4786, 4786-4789, 4789-4792, 4792-4795, 4795-4798, 4798-4801, 4801-4804, 4804-4807, 4807-4810, 4810-4813, 4813-4816, 4816-4819, 4819-4822, 4822-4825, 4825-4828, 4828-4831, 4831-4834, 4834-4837, 4837-4840, 4840-4843, 4843-4846, 4846-4849, 4849-4852, 4852-4855, 4855-4858, 4858-4861, 4861-4864, 4864-4867, 4867-4870, 4870-4873, 4873-4876, 4876-4879, 4879-4882, 4882-4885, 4885-4888, 4888-4891, 4891-4894, 4894-4897, 4897-4900, 4900-4903, 4903-4906, 4906-4909, 4909-4912, 4912-4915, 4915-4918, 4918-4921, 4921-4924, 4924-4927, 4927-4930, 4930-4933, 4933-4936, 4936-4939, 4939-4942, 4942-4945, 4945-4948, 4948-4951, 4951-4954, 4954-4957, 4957-4960, 4960-4963, 4963-4966, 4966-4969, 4969-4972, 4972-4975, 4975-4978, 4978-4981, 4981-4984, 4984-4987, 4987-4990, 4990-4993, 4993-4996, 4996-4999, 4999-5002, 5002-5005, 5005-5008, 5008-5011, 5011-5014, 5014-5017, 5017-5020, 5020-5023, 5023-5026, 5026-5029, 5029-5032, 5032-5035, 5035-5038, 5038-5041, 5041-5044, 5044-5047, 5047-5050, 5050-5053, 5053-5056, 5056-5059, 5059-5062, 5062-5065, 5065-5068, 5068-5071, 5071-5074, 5074-5077, 5077-5080, 5080-5083, 5083-5086, 5086-5089, 5089-5092, 5092-5095, 5095-5098, 5098-5101, 5101-5104, 5104-5107, 5107-5110, 5110-5113, 5113-5116, 5116-5119, 5119-5122, 5122-5125, 5125-5128, 5128-5131, 5131-5134, 5134-5137, 5137-5140, 5140-5143, 5143-5146, 5146-5149, 5149-5152, 5152-5155, 5155-5158, 5158-5161, 5161-5164, 5164-5167, 5167-5170, 5170-5173, 5173-5176, 5176-5179, 5179-5182, 5182-5185, 5185-5188, 5188-5191, 5191-5194, 5194-5197, 5197-5

several of the draughtsmen here who understand this work very well...": Sears was not needed there. That Sears' lithographic employment at the Survey Office included colour work is evident from the letter written from his sick-bed soon after this. He said: "the tracing of the Carrington Road alterations is in the safe rolled up with a piece of string around it and it is finished all but putting the color on the roads."⁴⁴ By 1898, Sears had again requested a transfer to a district office. In reply to the Assistant Surveyor General's query concerning the work Sears could do, the Chief Draughtsman at the Lithographic Branch, Mr Flannagan, wrote that "Mr Sears can do lithographic work on paper or on stone...but added that "he is irregular, restless and lacks interest in his work." The following year, Sears' absences from the department on photographic assignments for other departments began.

In 1899 he had been on leave of absence for 63 days to take photographs of lighthouses in the north for the Marine department, and this had caused a dispute about who should pay his salary. However, a memo of 1st February 1900 from the Hon. Mr. Hall Jones of the Office of the Minister for Public Works to the Hon. Mr. McKenzie (Minister of Lands) shows that Sears' photographic work was now in demand:

...The Hinemoa will shortly be going on the southern trip and if you can spare Mr Sears to complete the work by taking photos of the Southern Lighthouses he could at the same time supply your department with any photographs of New Zealand scenery, to include in any work the government may decide to issue. Should Mr. Sears apply for leave, I should be glad if you will give it your favourable consideration.⁴⁵

By May 1900, Mr Barron, who was now the Assistant Surveyor General, was becoming irritated and wrote to the Minister saying "Mr Sears has not yet returned nor do I know anything of his movement. I should be pleased to be relieved of his services wholly." But this did not happen; it was preferred that Sears remain attached to the Lithographic department. Instead a memo of the 21st June 1900 was sent to the Hon. Mr Hall Jones from the Premier's Office. Personally signed by Richard Seddon, the memo stated that on the trip south Frederick Sears "took a large number of photographs and his services have been of a beneficial character" and added that it was intended to issue the photos to accompany a report of the trip.

Subsequently Sears was sent to the Pacific Islands on a photographic job. On his return, Mr Flannagan reported to the Assistant Surveyor General that he had told Mr Sears "whenever he applied for work [in the lithographic department] it would be found for him."⁴⁶ In March 1902, a request came for Sears to again be released to take a series of photographs for the Department of Tourist and Health Resorts in the Southern Lakes district, with agreement that *that* department would pay both his salary, his travel costs and a daily allowance of 10/- per day on top. The negatives were to become the property of the department. By now the

Surveyor General had voiced a wish “to put an end to this unsatisfactory state of affairs” after he had received a memo from his department saying that they now had no knowledge of how Mr Sears’ time was spent: “He tells me his work is principally for the Premier and also for the Tourist department.”⁴⁷ At this juncture a proposal was made by J.W.A. Marchant, the Surveyor General, to have Frederick Sears transferred permanently to the Tourist department, but after the assignment was complete, instead he was again sent back to the Survey Department by the Superintendent of the Tourist Department:

Department of Tourist and Health Resorts
Wellington, 21st August, 1902.

The Under Secretary
Lands and Survey Department

Mr F. Sears, who has been taking photographs for this Department, has now completed his work, and has been instructed to report himself to your Department today.

T.E. Donne Superintendent ⁴⁸

At the bottom was a question dated 25/8/02 from Mr Marchant directed to the Chief Draughtsman: What work have you for Mr. Sears.” Mr Flannagan replied:

The Lithographic department being now under the control of the Government Printer, there is no work in this office suitable for Mr Sears. There is general draughting work to be done, but Mr. Sears invariably maintained that as he was a lithographic draughtsman he should be employed in lithographic work.

Flannagan 3/9/02 ⁴⁹

This marked the end of the road. Writing on 16/10/02 from Berhampore in Wellington to J.W.A. Marchant, the Surveyor General, Frederick Sears said:

My dear Sir

After careful consideration it is evident to me that under the altered conditions of your department my services are no use whatever to you.

I am a Lithographic Draughtsman and know absolutely nothing about plotting, computing or calculating. Seeing that the change had made my position untenable, and through no fault of mine I take this step....I respectfully ask that I be retired upon compensation from the end of the present month. I have been an officer of the department for 8½ years but have no doubt whatever of (given health and strength) succeeding by my own energies in forging ahead....

Yours faithfully

Frederick Sears⁵⁰

These were prophetic words, for it was about two years later that Sears met up with Rubel, after which their inventive talents led to the breakthrough for lithographic printing. There had been a final dispute concerning whether Sears should have retirement compensation, but this was denied because his position had been “temporary”. According to a note at the bottom of correspondence of December 1902, Sears’ last job in the lithographic department had been to work on improving the stamps for the Postal Department of the Cook Island Group. The letter sent by Sears in reply to a letter of 4th November from Mr Marchant accepting his resignation stated that “up to the present I have not resigned.”⁵¹ However, in a

reply to an enquiry from the department from the Under Secretary to the Lands and Survey Head Office re Sears' unpaid insurance policy premiums for November and December, the Secretary of the Government Life Insurance Department noted that "the assured has left the service." This letter was dated 12th January 1903.

During his time in Wellington, Frederick Sears had also run an engraving business. The letter in which he had denied that he had resigned from the Lithographic Branch was on paper bearing an engraved letterhead: "The Sears Engraving Co, Engravers by all processes, Studios, Berhampore, Wellington, N.Z." This was not the first time that Sears had been in business on his own account, as he had previously had a printing business in Queensland before coming to New Zealand. Again, like his inventor predecessor Herbert Deveril, Frederick Sears had earlier gained experience in Australia, and had lived and worked in several States at least from the early eighties until his move to New Zealand. In an article 'Lithography and Process at the Antipodes: Reminiscences of Frederick Sears', written for the *Penrose Annual* of 1905/06, he mentioned being an officer in the Western Australian Government Survey Department, and also that he had worked in South Australia. He recollected that it had been there that he had produced "an imitation of a £1 note for a tailor's advertisement", for which the tailor, Mr Burns, had been "committed for trial for issuing a colourable imitation". Apparently the case was not pursued, but some of the copies had passed as genuine notes. Sears reported that one bank had taken thirty. However, during his time in Australia, especially when in business in Queensland, he had experienced many of the hardships under which Antipodean printers worked, not least the hardships due to the rigours of climate. It had been the great floods of 1890 that had put him out of business, prompting him to sail with his family for New Zealand soon afterwards. Sears recounted that not only had the floods washed his house out to sea, but also had risen "20 feet above my machines and left them buried in slime and clay."⁵²

It was both his wide experience and his expertise in the lithographic and the photographic arts that eventually enabled Frederick Sears to correctly assess the state of the art and the future for lithography. His subsequent experimentation enabled him to come to a position where he was able to make the contribution to photomechanical printing which in turn furthered the cause of commercial colour printing. It had been in New Zealand that Sears had become closely engaged with photography but without losing his lithographic expertise and his keen interest in the future of colour printing. In 1905 Sears had stated that by his judgment "three-colour lithography is the coming process..." and had observed "what a vast amount of business has the chromolithographer lost since the introduction of the three-

colour process and how much is still wanted to make that process perfect.” His personal and continuing attraction to the lithographic arts was also made clear:

Lithography as a profession is a most fascinating one, from the time when the apprentice makes his first transfer, from which he anxiously takes his first impression, to the time when he is able to master it in all its intricacies and details and show, with pride, proofs of beautiful chromolithographs, dainty commercial letterheads, note-heads, business cards, etc. which he has turned out to the satisfaction of the artist, his employer and the general public alike.⁵³

Once back in England, Sears’ own observations made him realise that lithography was being left behind as he wondered why lithographers in general had not availed themselves of the many photomechanical processes, “while all around...like mushrooms, hundreds of half-tone businesses have sprung up”.⁵⁴ Sears had begun to question what could be done. The insights that Sears had gained while engaged in lithography and photographic work in New Zealand had helped him to see the way ahead. He talked to the English half-tone process block engravers whose opinions of lithography were low: for instance they thought it “too flat.” However, Sears did not accept that as definitive, saying “they are all wrong.” In his article he shared his insight into the secret of successful photolithography, stating that it lay in the making of the negative, “so that all the superfluous screening is gone.” Sears said that this would allow the blacks to become beautifully rich and velvety and the most delicate tones of a wash to be far more faithfully reproduced. Furthermore, printing did not need to be on highly coated paper, which he regarded as most inartistic in itself as it showed the screen. This he described as an ‘eyesore’. Frederick Sears instead championed the lithographic processes, saying:

I have no doubt whatever that three-colour by lithography, with an additional printing or so, is the coming process, and every lithographer should work to that end, and try to get a little of his own back.⁵⁵

‘Alzinography: Lithography of the Future’

Sears took his own advice and worked on the problem of modernising and perfecting commercial lithographic colour printing. In the 1908/09 *Penrose* article he discussed his own method for photo-offset, his relationship with Ira Rubel, and some of the difficulties of colour printing before the invention of colour film in the thirties finally allowed original colour photographs to be produced. Frederick Sears’ article is as much a tribute to his friend and partner-in-invention, Ira Rubel, as it is an exposition of the new lithographic method that was applicable to colour printing, and which at the time was just beginning to gain ground over trichromatic relief processes. One reason that there had been difficulties with half-tone relief colour printing was that in the early part of the twentieth century standards for photomechanical printing processes were rudimentary and the tri-chromatic relief processes still involved much trial and error, partly due to difficulties with ink quality and density.

Frederick Sears, who felt that the answer to some of these difficulties lay with the lithographic processes, said "the only hope of getting perfection with three colours lies in the hands of the lithographer."⁵⁶ The tone of Sears' *Penrose* article is notable for its confidence: he and Ira Rubel had been working together for around three years, and by then Sears felt able to unequivocally declare that:

The future of illustrating in colour and monochrome will be done by high-light negatives as the base, the litho artist as the guide, and the off-set rubber machine printing from zinc on to rough drawing paper. I make this statement without fear of contradiction from anyone who is capable of judging, lithographer, artist or process block man.⁵⁷

At the time, because the relief colour processes were imperfect, much adjustment had to be carried out after the photographic separation had been done and prints for each colour had been etched. The problem was that further colour adjustment, designed to get final tonal qualities correct, involved further etching, but this practice carried with it the danger of destroying the half-tone dots. If that happened they could not be restored.

The block man prints his three half-tone negative, red, yellow and blue, each one on to a separate piece of zinc; he now commences to etch away the false tones, to re-etch, fine etch, and re-etch again, and after he has taken days, and sometimes even weeks, to get his high-lights and gradations correct he has been aiming to get at where the litho man was when he had printed his high-light negatives on to the grained zinc. When he has gone through this performance with his red, yellow and blue, he takes a proof, and if it is not like the copy he etches a bit off one colour, and then another, and then a third, until at last he can go no further and the block must do.⁵⁸

For the lithographic colour processes, dot size was critical: if too fine they could easily be etched away, but if too coarse, the appearance of the product was rather flat.⁵⁹ William Gamble, writing in 1910 of Frederick Sears' solution to the problem, said that the essence of his method lay in the preparation of the negatives: it was "a method of eliminating automatically in the negative the dots in the high-light portions, so allowing the half-tones to grade down to pure white...a much better way than the method of elimination by hand-work."⁶⁰ Lithography offered a solution to the problem from another perspective. Because the lithographer was working with a planographic printing process, he had the advantage of more easily being able to adjust colour because he could add colour as well as subtract it, whereas if relief dots had been mistakenly etched away, they could not be replaced. In addition many of the chromolithographers of the period were skilled in colour judgement, and this ability, for which the pre-requisite was excellent colour vision, was invaluable when it came to adjusting the proofs. Frederick Sears explains, from the point at which the colour separation negatives have been taken:

...we have our high-light metzograph negatives, red, yellow and blue, with all the gradations from solids to pure high-lights. We print each on to separate pieces of litho-grained zinc, etch them (which takes about ten minutes), and then proceed to get our colour proofs....a lithographic artist can at once see if there is too much red, yellow or blue, and if any want reducing, he reduces by etching, which takes a few minutes, and if there is too little colour here and there the plates are re-prepared, and with litho chalk or litho ink he draws in the deficiency, and if he thinks it necessary prints the blue negative on to another piece of zinc and works it up for

a grey or an extra red or an extra blue, and by this means and process he can get so near the original that all but perfection is obtained by five printings, and the product is equal to a chromolithograph in twelve or fifteen printings...⁶¹

However, another problem of multiple colour lithographic printing, especially by the direct method, was that the dots of colour were apt to spread on printing, leading to colour error. Register was another difficulty. However, the fortunate alliance between Frederick Sears, who had worked out the process, and the New Jersey printer, Ira Rubel, who developed a new 'offset' press, led to the birth of offset lithography. It had been the interest in printing on tin that had sparked the original interest in offset, but Rubel was the first to stumble upon the offset principle for printing on paper. Rubel's interest had been initially aroused in 1904 when he had by chance noticed that a superior image could be printed from an image inadvertently transferred to the rubber blanket of the impression cylinder from the plate cylinder of his rotary press.⁶² Ira Rubel first developed offset machines in partnerships in both America and England. George Mann took out a patent for his offset machine, the first to be designed in Britain, in 1906. The rotary press had a rubber blanket on a cylinder to receive the offset impression from the lithographic metal sleeved onto another cylinder, and from here the offset impression was transferred to paper fed between it and a third cylinder. The increasing use of offset gradually caused the flat-bed machines and rigid stone to become obsolete.

Frederick Sears also paid tribute to Colonel Wright Bemrose of Bemrose and Sons Ltd., Derby and London, who he said had been of great assistance to him in England, not least in offering critical advice on the results produced as Sears perfected the new process. Commenting that "one print speaks more eloquently than a thousand words to the practised eye of the lithographer," Sears sent some of this work to be reproduced as a supplement in the *Penrose Annual* in the same year as the article on the new process, it being included as the plate 'Entering the Harbour'. (Plate 10A.) Sears' description gives insight to the lithographic printing process, and the equipment and machinery in common use at the time. Having alluded earlier to his discussion of photo-mechanical processes as applied to lithography "in previous issues of the *Penrose Annual*" he later said:

Although I was not represented in the Annual last year I was not idle. In fact I was too busy to get a colour supplement ready in time, and one print speaks more eloquently than a thousand words to the practised eye of the lithographer. This year I am pleased to place before my lithographic friends two supplements by my process in five colours, yellow, red, red, blue, and grey. There have been many funny objections to my process, such as "too flat, can't be done, no good, too fine, won't transfer, can't do litho from zinc,..."

Plate 10A: 'Entering the Harbour.' Printed by Bemrose & Sons Ltd. using the 'Sears Highlight Process'. Published in the *Penrose Annual*, 14 (1908/09), following 16.
Held: Victoria University of Wellington Library.

THE HARBOR OF LONDON.

W. H. W. & CO. D.

The only one worth considering, in my opinion, is whether the metzograph screen is too fine and not transferable. I have, therefore, worked the specimens in this book to answer that objection. In the first place, the metzograph negatives were made and printed onto zinc, rolled up, etched and proved. Re-transfers were then taken from these zinc plates and transferred to lithographic stone, and lithographed in a Ratcliffe flat-bed litho machine with the usual amount of care displayed by the lithographic printer who worked it.⁶³

In the 1908/09 *Penrose Annual* in which appeared both Sears' article and the plate prepared by Bemrose and Sons Ltd. from the process, the editor referred to both in the preface under the heading 'The Sears Highlight Process', saying:

This method has found its most successful application in lithographic colour work, and in conjunction with the Metzograph screen has been found capable of yielding results of such delicacy and softness coupled with faithfulness of reproduction as no hand drawn work could attain, a further advantage being the reduction in the number of printings. From three to five workings are found to yield all that can be desired, and the advantage of being able to save the expense of the draughtsman's work and the possibility of printing it at a high speed from the zinc plates on ordinary lithographic machines makes it very commercial. Messrs Bemrose and Sons Ltd. have the process in daily use at their Darby works, and the result shown by them in this volume will speak for itself...⁶⁴

By this time Bemroses prepared their zinc plates according to Sears' formulae:

They prepare their own zinc plates by the Sears' formulae from the finest to the coarsest short grains, and their staff of artists have now become experts in all classes of work on zinc, drawing in from one to six or more colours from D.Demy to two-sheet 40 in. x 60 in. posters, which are run off on the rotary, flat bed and off-set machines.⁶⁵

In R.M. Burch's 1910 book, William Gamble referred to Sears' work, explaining the essence of his considerable contribution, and assessing it as a real improvement.

Advantages of Offset for Commercial Colour Printing

One of the advantages of offset was that the original image did not need to be drawn in reverse, and another was the economic use of ink. The pressure of the rubber on the paper was gentle enough to mean that only a thin film of ink was required, thus making possible the "sharp reproduction of even the finest hairline, as is obtained in copper engraving, together with full density of large solid surfaces."⁶⁶ It was also found that an advantage of offset lithography was that there was not the need for special paper as for letterpress half-tone, and as well the half-tone could be much better printed than by the ordinary flat-bed system. This applied especially to colour half-tone where several over-printings were required, partly because offset presses allowed for more easily controlled register.⁶⁷ It was found possible to perfectly print half-tones up to two hundred lines to the inch using offset printing, the earliest known English example being the print *A Spanish Beauty* produced on a George Mann and Company offset rotary litho. machine by the London printers W.W. Sprague & Co. which was published in the *Penrose Annual* in 1909-10. This reproduction was from five printings using red, yellow, blue, flesh and a neutral tone. William Gamble commented that although the paper was rough surfaced, the appearance obtained was soft and clean, with good register apparent.⁶⁸ (Plate 10B.) An example of their work from around the same time is the print 'Domino' printed in R.M. Burch's book.⁶⁹

Offset Begins in New Zealand in 1914

Offset lithography was the last major printing process introduced into New Zealand during the period under study, when the arrival in 1913⁷⁰ of the first offset presses opened the way for the commencement of offset lithographic printing by Wilson and Horton Ltd in 1914⁷¹ with its attendant advantages for colour printing. At first it was mainly confined to jobbing printing use, for the production of maps, charts and posters, although I have not verified if these items were in colour.⁷² Coincidentally, the same year marked the beginning of a period when cultural ties between New Zealand, Australia and Britain were yet again reinforced, during World War I, albeit in calamitous circumstances. This in turn began a period of shortages of materials for the printing industry, and of disruption in developments and communication of new technology.

Innovation and Colour Printing Equipment in the Colonies

Dissemination of Knowledge from Overseas Research

A symbiotic relationship concerning printing research developed with the readership of trade journals such as the *Penrose Annual*. As new equipment was developed, improvements made, and processes researched at overseas establishments such as the Penrose Laboratories, and elsewhere, printers were able to take advantage of the new knowledge acquired for the industry which was publicised in both the *Annual* and the *Penrose Catalogue*, while Penroses obtained business through meeting the need of printers, including those in the colonies, for new supplies. For example, as improvements were being made in photomechanical methods, William Gamble considered that just before the turn of the twentieth century, one of the most significant advances had been the advent of the “colour-sensitised collodion emulsion developed by Dr. E. Albert of Munich, which gave a much better colour rendering than dry plates, and at the same time produced a negative which was more suitable for process work.”⁷³ This improvement, introduced in England in 1899 by the Penrose Company, led on to the development of a more efficient ‘Direct Process’ at the Penrose laboratory, the refinement consisting of exposures through the colour filter and the half-tone screen being made at the same time to produce the colour separations, thus gaining an important efficiency. By 1906, Panchromatic plates were available commercially.

Plate 10B: ‘A Spanish Beauty.’ Design & Photo-chromo-litho by Pemsel & Lembke, London. Executed in five printings on a Geo. Mann & Co. Ltd. Offset Rotary Litho Machine by the London printers W.W. Sprague & Co. According to R.M. Burch, this was the first known offset colour print executed in England. Published in the *Penrose Annual*, 15 (1909/10), opp. 200. Held: Victoria University of Wellington Library.

A SPANISH BEAUTY.

[illegible]

Advances in Printing Machinery for Tri-chromatic Printing

By the early part of the century there had been many improvements in printing machinery that were to aid colour printing, particularly three-colour printing. William Gamble reported that The Miehle, Century and other American machines of the two-revolution type were found to give more perfect register and increased inking power. Both of these factors were of benefit to the three-colour process, with the result that English and German machine makers soon followed on the same lines.⁷⁴ However, the strength and inking ability of platen presses had been improved, raising the quality of colour impressions possible on those machines.

Various machines that had been developed to cope with several impression colour printing included the Orloff press, the Lambert press, and the Tandem Miehle. The Orloff press incorporated a composition roller on which successive colour impressions were offset until the entire complement of colour had been transferred, after which it was printed to paper at a single impression. However, this type of press was found to produce its best results where light tints only were required. Thus its main suitability was to the printing of such things as cheques and banknotes. The Lambert press, which was French, consisted of four beds, and the same number of ink slabs, sets of rollers and impression cylinders. After the sheets had been fed in, they were carried automatically from one cylinder to another until the entire four-colour print was delivered. The Tandem Miehle consisted of three machines joined together so that automatic delivery occurred from one to another. One problem for several impression colour printing on this machine was that there tended to be insufficient drying time between each impression so that where heavily inked formes were required it was not able to cope as well.⁷⁵

In America, good colour results were being obtained using offset methods from the Potter presses. Judging from the progress, Burch prophetically predicted in 1910 that offset lithography would become 'a considerable factor' in the future development of colour printing. In fact, much improvement was later made in the quality of offset, especially during the twenties and the years of the depression, although Warren Chappell has commented that "the medium never produced as good results in American as in European hands during its period of development."⁷⁶

Presses for the Colonial Colour Printer

The New Zealand colony typically lacked the copperplate press, especially at first: the platen press and then the Wharfedale had been the staples. As mentioned, iron platen presses were brought to the country early to accomplish the general printing needed, for

example, the Columbian Eagle press bought to New Zealand in 1842 by the Church Missionary Society for the use of William Colenso, and the similar press used by Samuel Revans to print the *New Zealand Gazette*. This had meant that especially at first map printing had presented a challenge. However, recourse to lithography did not entirely solve the problem, as even then a more satisfactory press was needed for this work. Thus it was that Jones and Bluett, who built the lithographic press on which the early eighteen forties printing of maps such as their 1841 'Plans of Wellington' was then accomplished, had been early New Zealand innovators in this field.

Apart from such forays, dictated by necessity, it was the case throughout the period under study that New Zealand printers had to import all presses and machinery, mainly from their northern hemisphere places of manufacture, Britain and North America (to a lesser extent): cutting edge engineering innovation leading to the development of new machines lay elsewhere. However, from the mid nineteenth century "a number of Australian firms began to manufacture copies of European designs, with or without authorisation,"⁷⁷ and by the eighties, for printing presses required by New Zealand printing firms, "Wimbles in Australia became another important source."⁷⁸ For graphics printing the early adoption of lithography, and its subsequent dominance in this area of printing, coupled with the difficulty and expense involved in the acquisition of new presses, were conditions that tended towards a certain uniformity of press equipment operating in New Zealand. It was only the occasional enterprising New Zealander who attempted innovation in this area. One example was William Day, a Printers' Manager, who in 1891 applied for a patent for an 'Improved Blocking Press', which was listed under 'New Zealand Inventors' for that year as "Pending."⁷⁹

In Melbourne the *Herald* had imported the first steam-printing press into Australia in 1850,⁸⁰ a Napier Improved, the year before the London branch of the Glasgow firm, McLure, McDonald and McGregor had been the first firm in Britain to use power printing for lithography after purchasing a Sigl press in 1851.⁸¹ In 1852 Sigl had obtained an Austrian patent for the powered lithographic machine built in 1851 with a flat stone and roller that was damped and inked automatically. It had not been until 1866, shortly after the debut of chromolithography in New Zealand, that the Government Printer had introduced a steam powered press in Wellington, the year before the establishment of the lithographic department at the Government Printing Office. The Dunedin printers Coulls and Culling had also been among the first to introduce steam powered machinery to boost production speed in that city. W.A. Glue recounts that although the Belle Sauvage machine ordered

from Harrild and Sons in England for the Government Printing Office had arrived in about April 1866 and a pressman engaged from England to operate it had arrived in July, at first the new machine had to be worked by hand, as it had arrived without the steam engine it had been assumed would come with it. However, after tenders were called, a 6 h.p. high-pressure steam engine was acquired, and after this "the work began to flow from the Government press", ⁸² the new machine being capable of 1100 impressions per hour. The capacity of the steam engine apparently allowed for a second double crown Belle Sauvage press to be installed in 1868.⁸³ As reported by R.A. McKay, Wharfedale machines, which had first been introduced in the eighteen sixties, were suitable to the major processes in use in New Zealand, and it was the successive models of these machines that became ubiquitous in the colony⁸⁴ and were still dominant at the turn of the twentieth century, even although from the mid nineties some rotary presses, notably from R. Hoe and Company of New York, had been imported for newspaper production. Hand-presses, however, often remained in service for job printing, and small rolling presses had been in use in New Zealand, probably for pulling proofs, from around 1880 onwards.⁸⁵

By the nineties, new colour machines had been arriving in Australia. In 1891, R.C. Harding reported on a new machine, capable of four colour work, which was being installed for the use of the Victorian Government, and had been brought to attention by W. Allison, of Little Collins Street who sent a parcel of illustrated circulars showing

the celebrated Marinoni web perfecting machine with specimens of fine bookwork (*The Girl's Own Paper*) and an illustrated supplement to the Paris *Petit Journal*, showing the fine work produced by the new multi-color web machine. This prints in four colors and folds at the rate of 10,000 per hour, and has caused some sensation in London...Mr Allison informs us that he is now erecting the third Marinoni machine for the Victorian Government.⁸⁶

The vertical Miehle machines, found to give much more perfect register and increased inking power, both conditions favourable to process colour, were not imported into New Zealand until after the period under study, in 1923 by Whitcombe and Tombs in Christchurch, only a year after their appearance in America. R.A. McKay states that the L.&M. Miehles (Miehle design presses that were manufactured by the Linotype and Machinery Ltd company (L.&M.) of London) had been used in New Zealand in 1914 by Wilson & Horton⁸⁷ who had always been at the forefront of innovative practice in New Zealand. The original Miehle machines of the two-revolution type had been introduced in Chicago in the 1880s. The advent of offset machines had begun a whole new era, especially for colour printing, when they were brought into New Zealand in 1913.

Ink

Ink is fluid containing colouring matter in suspension which usually has staining power without body, but printers' inks are composed of pigments mixed with oil or varnish. Transparent inks do not have body colour, and can be used to obtain fine tonal gradations by superposition. Until the late nineteenth century, ink was made of linseed oil and lampblack which gave the colour, and to produce other colours the lampblack was replaced, for example, with ground vermilion to produce red. Since the quality of the ink depends on quality ingredients, especially of the oil base, which was often not as good as it could have been, standardisation was difficult to achieve. "There were specialised ink makers, but until the mid-nineteenth century, many printers made their own ink, which was indeed the source of many of the problems of quality."⁸⁸ Especially for lithographic work where "the variations in the tone of the lithographic washes depended primarily on the density of the ink used for the drawing on stone ... it was not easy to assess the strength of these tones."⁸⁹ Such technical uncertainty increased the difficulty of the chromolithographer's task.

The fact that some printing firms have survived long enough to publish their histories, sometimes at the centennial, has often been helpful in tracing the progression of the phases in their printing history. One such firm was that of the early Sydney firm W.C. Penfold & Co. A short account of the hundred years spent by this Australian firm in the printing business has shed some light on early difficulties experienced with essential printing materials such as paper and ink. (See also chapter 4.) In the early eighteen thirties, Penfolds had published items such as a sheet almanac and by 1837, the *Australian Diary and Almanac* in spite of the difficulties of the time mentioned by the *Sydney Gazette* in obtaining good type and ink. Allusion is made to the poor quality of ink being the cause of illegible printing. The problem was explained as being due to the experimental nature of the ink: at that stage attempts were being made to manufacture inks locally, a task that was not only expensive, but also laborious and unpleasant. A report in the *Sydney Gazette* at the time, commenting on ink-making, said that "it is one of the most difficult and disagreeable tasks that can possibly can devolve to the printer of a paper, to make his own ink..."⁹⁰

Inks from Sidney and George Cooke, the Melbourne firm which had established a small ink manufacturing and print broking business in Little Lonsdale street by 1872, had by 1880 reached such a standard that they had been awarded a silver medal for printing excellence in both coloured and black lithographic inks at the Melbourne Exhibition.⁹¹ In the absence of any locally manufactured ink in New Zealand, this essential commodity had to be imported, a condition that was to continue for the greater part of the period under study. McKay

pointed out that the ink-making firm of Morrison and Morrison was eventually established in Christchurch in 1908, although McLintock states that the first printing ink was not made in New Zealand until 1939: this was when the Australian firm of F.T. Wimble and Co. began its manufacture in New Zealand.⁹² According to A.A. Smith, C.J. Morrison had noted the absence of any ink manufacturing in the Dominion of New Zealand when on a business trip to this country, and seeing the opportunity, formed a partnership with Charles Brown, a Melbourne ink-maker expressly to fill this market niche. They operated at first with only "a very large gas engine and a very small ink-grinding mill." This appears to have been around the middle of the first decade of the twentieth century, because the partnership with Gerald O. Morrison (his brother) was not formed until the departure of Charles Brown for Melbourne once more in 1908. Smith reported that during World War I Morrison and Morrison began the production of "many special lines of inks which had previously been imported," with Gerald Morrison later travelling to North America in order to gain experience "in the production of the inks demanded by the development of new printing processes."⁹³ Smith states that his information was obtained from printing houses still in existence in 1953 in Canterbury.

Paper

One of the basic requirements of the printer, including of the colour printer, is paper, and for graphic production, higher quality paper, often coated, was demanded, according to the job. However, in New Zealand, as stated in *Book & Print*, it has been the case that "throughout its history the vast majority of printing papers used in New Zealand have been imported"⁹⁴ so that New Zealand innovation in this area was minimal during the period under study. In 1876 the first commercial paper mills in New Zealand were established at Woodhaugh in Otago and at Maitai in Southland.⁹⁵ However, by the late eighties the two operational paper mills in Otago were Fergusson and Mitchell's paper mills, where the first printing paper had been manufactured in 1885 for the Wellington Exhibition, and Maitai.⁹⁶ Both mills produced mainly brown paper for bags rather than newsprint or quality printing papers, because neither found the production of white printing paper profitable⁹⁷ although by the end of the nineteenth century, some had been produced.

It was reported in an article on the Maitai exhibit at the 1896/97 Industrial Exhibition in the *New Zealand Mail Christmas Number* for 1896 that although to that time Germany, England and America had been supplying colonial demand for paper, Maitai was showing that attempts were being made to manufacture a greater variety of paper within New Zealand. "The samples shown are strong manila, stout hosiery cartridge, yarn and six

varieties of printing, white and coloured glazed and unglazed..."⁹⁸ Fergusson and Mitchell's Otago Paper Mills, which were near Dunedin, also had a substantial bay at the exhibition where products such as paper bags and materials made up into rolls and sheets were shown. These were described as "glazed, medium and extra thin, brown and other colours, some very thick like carpet felt...there is also a light, tough quality of white printing paper shown."⁹⁹ However, by then it had become cheaper to import printing paper than hitherto. In 1891, R.C. Harding had reported in *Typo* that the price of printing paper imported into New Zealand had dropped in the decade between 1880 and 1890, the average price per hundred weight being 59/- in 1880, and by 1890, 23/6d.¹⁰⁰

As pointed out by Sir James Fletcher, for New Zealand paper manufacturing to be a successful business it had to be of international standard, and therefore the papermill also had to be of international standard. To become a viable reality in a small country such a business needed to be subsidized, and also to export. In New Zealand such conditions were not fulfilled until the middle of the twentieth century when Fletchers established the Tasman pulp and papermills, where from the first, 70% of the production was exported.¹⁰¹

Types

In the absence of local type-foundries, types of all kinds also had to be imported by New Zealand printers. Although the nearest typefoundries were in Australia, in Sydney and Melbourne¹⁰², the major suppliers were in the northern hemisphere. Keith Maslen has pointed to the comment made by George Griffin in the *Colonial Printers' Register* of 1881: "it is a pity that [the English founders] so neglected the colonial market, which, in the matter of ornamental and other jobbing type, is almost monopolized by the Americans."¹⁰³ It is known that some of the Australian types were exported to New Zealand, for example, from Alexander Thomson who began the first Australasian type foundry in Sydney between 1841 and 1843.¹⁰⁴ However many of the early Australian types were copies of typefaces that had been manufactured in overseas typefoundries in the first place.

Through his journal *Typo* R.C. Harding gave valuable information and advice to printers on how to get the best out of the plethora of new type specimens coming out from the overseas typefoundries, each issue including a column on new specimens. In this journal, such advice included much on the use of decorative sorts and how they could be used effectively for colour work. Of interest to the colour printer were Harding's critical reviews, bringing to notice new ornamental types, borders, initials and devices for decorative work, many of which were suited to colour work. Harding's advice on their effective use was aimed at raising standards and assisting printers to make best use of new developments in display

typography. For example, in the December 1887 issue, under the heading that appeared as a regular feature, 'Recent Specimens' Harding had commented on a new 'Primrose Series':

The large corner is very pretty, and the pica pieces are simple and neat, but the two-line pica characters, though beautiful in detail, are ill adapted for a running border, producing a clumsy effect. These pieces are shewn for working in three colors. In combinations we have the Renaissance border of 55 characters — something in the style of the 'Holbein'; a grand new border for colors, un-named, containing 98 sorts ...and a charming 12-point heraldic border on solid ground,... We have also several sheets devoted to the display of these combinations, beautifully worked out in color."¹⁰⁵

In later volumes of *Typo*, Harding printed some of the newest and best specimens in colour so to lead by example. (See chapter 12.)

Other Equipment and Processes

Some local New Zealand woods such as kauri were used for Australasian block making and there was considerable trans-Tasman trade in such equipment. An 1880 report concerning colour printed posters published in *Griffin's Colonial Printers' Register* on the Melbourne Exhibition mentioned the use of such blocks in Melbourne, and cited an exhibit from the printer Mr Azzopardi of the Electro and Stereotype foundry, La Trobe St West:

On the wall, he exhibits a number of pictorial posters. These were designed, engraved and printed in various colours by Mr. Azzopardi. The blocks used were of New Zealand kauri pine and Tasmanian huon pine.¹⁰⁶

Innovative processes and new inventions in the area of printing equipment were often reported by R.C. Harding who stated that it was one of *Typo's* objects to keep its readers abreast of the times with regard to all useful designs and new inventions: "*Typo* notices every improvement or new invention of importance in connexion with printing."¹⁰⁷ Information concerning substitute wood type and printing blocks being made from paper pulp and improvements that had been made to zinc lithographic plates were reported in the late eighties.¹⁰⁸ The advent of the airbrush was noted in the June 1887 issue as "an appliance introduced into lithography which has found much favour. The color is contained in a soft pad connected with a pneumatic tube which the artist works with his foot..."¹⁰⁹ For printers working in lithography, whether in monochrome or in colours, an interesting development that was reported in 1890 was that of artificial lithographic stone. The German firm of Wezel and Naumann were pulping litho stones and other ingredients, and spraying zinc plates with the mixture, the plates thus prepared being capable of yielding as many as 6,000 impressions.¹¹⁰ Following the successful use of this innovation by a London firm, in 1891 Harding's advice to New Zealand lithographers was:

New Zealand lithographers, if they would keep pace with the times, must keep their eyes upon the new artificial substitutes for litho. stone. The natural stone is becoming increasingly costly, and the exhaustion of the quarries is only a question of time. The Wezel and Naumann substitute has been introduced by Messrs Vincent Brooks, Day & Son of London, with complete success. The artificial stones are lighter and in all respects more manageable, cost only one-fourth of the ordinary stone, and can be made to any size required.¹¹¹

Not only did Harding bring new printing innovation before his readers, but also encouraged them to be inventive themselves, saying "Everyone should try to be an inventor, to improve known processes and machines..."¹¹² One of the improvements Harding had word of in 1890, and which he called "the most important invention for ages" was that of an automatic feeder suitable for the Wharfedale, which allowed it to take thick or thin paper.¹¹³ He also drew to attention to a new job machine that allowed automation of printing from the web, down to the cutting and counting, and which could do between 3,000 and 6,000 impressions an hour. In the same year Harding pointed printers to a "fine half-tone engraving in the August/September *American Art Printer*, and commented that the recent discovery by which relief blocks could be etched on hitherto intractable metals was of immense importance in art illustration."¹¹⁴

The nineties was an especially innovative period as interest in colour processes grew. In August 1890 a new method was noted that had been demonstrated in the New York *World* of 11th May which had showed "about a third of a page printed in red, entirely surrounded by black, which was done from one plate at a single impression, on a rapid rotary press, printing 24,000 eight-page papers per hour". Harding reported that it was the first time such a feat had been accomplished.¹¹⁵ In 1891, a new multi-color process that had been reported in the August issue of *Paper and Press* was highlighted in *Typo*, a method by which the inventor had claimed to obtain 62 colors at one impression.¹¹⁶

As mentioned, in their isolated New Zealand setting, many printers who were unable to travel resorted to working from textbooks, and innovation in the form of ingenious improvisation was common. R.A. McKay, who has described many of the difficulties that beset the early process worker, recalled such invention at Spencers in Auckland around the turn of the twentieth century. Half-tone screens were made "by very carefully winding thin wire or silk thread upon a frame and then cutting out each alternate strand, two negatives being made and then bound together to give the cross-line effect required."¹¹⁷ Much secret experimentation of the kind had been prompted, especially in the early days of half-tone printing:

Operators spent hours cutting and experimenting with new shapes and stops, each thinking he had something far better than his competitors. Every man carefully guarded his trade secrets and formulae. It was the usual practice for the etcher to complete his job from beginning to end, doing his own operating, printing, etching mounting and proofing.¹¹⁸

Etching was often done by painting the block with brunswick black after the first few etches and then deepening the etch with strong acid. McKay pointed out that at the time there were no routers, etching machines or power rockers. He recalls one incident from these times of

improvisation when “the whirler was a converted sewing machine, one apprentice whirling so fast that the plate was hurled through a window and half-way across the street.”¹¹⁹ In New Zealand, printers were endeavouring to keep up with perceived overseas colour printing trends while employing plant already installed. For instance, from around 1900 some New Zealand printers were employing a simplified colour palette for their chromolithographic productions, applying three primary colours stipple style to simulate the appearance of the coarse half-tones that were being seen in British publications.

Towards Colour Printing Diversity in New Zealand.

For New Zealand colour printing, the beginnings of process work and the introduction of associated tri-chromatic colour processes in the late nineteenth century climate of experimentation resulted in a wider variety of choices for the commercial printer when the addition of colour for the printed page was to be undertaken. As well, the fact that the photomechanical processes were tipping the colour printing balance from a largely art footing towards a more standardised scientifically based approach facilitated the greater possibility of colour printing becoming a more economic part of the general New Zealand printing industry of the future. This can be discerned by looking first at some of the colour printers and firms within which colour printing was typically a part of the business in each of the main centres up until 1914, and then at a cross-section of colour printing as it was appearing in the various genres in which it was being used, to give an overview of how local practitioners were using a variety of processes, as appropriate, to bring colour to the New Zealand marketplace of print. These themes, the colour printers and their businesses, especially those of the Lower North Island, and the genres in which printed colour was being brought to the New Zealand market will be considered in greater detail in sections IV and V.

Response to Question 3.

(See Comparative Timelines: Figures 10 and 11: Volume 2, Appendix 1 B-C.)

For colour printing to better serve nineteenth century commercial mass market needs, several new inventions and their attendant improvements had to be made to successfully work together. Key foundation innovations to 1914 that were as relevant to colour printing in New Zealand as elsewhere included electrotyping, photography, lithography, and the half-tone process. Attendant nineteenth century developments that were specific to colour printing advancement had included breakthroughs in the theories of colour, in ink composition and in colour specific light sensitive coatings. It was to be expected that the newer inventions, such as those of lithography and photography, should spark a great deal of innovative activity as technical possibilities were explored, and that where viable

business applications were identified, relatively rapid developments occurred as many people simultaneously made investigations. In the second half of the nineteenth century such activity produced the new photomechanical colour printing processes, opening commercial possibilities to printers on both sides of the world.

Colour Printing Processes Available to British Printers 1830-1914

Colour processes available over the period to British printers before the advent of the photomechanical processes had ranged through all the main styles of printing, including intaglio, aquatint, relief wood engraving and wood-block printing, planographic tint lithography and chromolithography, as well as other less common processes such as nature printing. During the study period, as the photographic processes were harnessed to printing, a plethora of new colour processes were added and by the end of the century and beyond colour printing began to change from a bias towards the manual art processes towards more scientifically based photomechanical processes.

At the beginning of the study period, during the eighteen thirties and forties, the lithographic colour processes of tint lithography, chromolithography and lithotint had first become viable for British printers. Colour relief woodblock processes were already in use, such as those developed by William Savage and Charles Knight, as well as George Baxter's combination intaglio/relief colour process, 'Polychromatic Printing', which was later open by licence to a limited few. The older intaglio colour aquatint, while still available, was waning, and a few minor colour processes, such as those for bank-note printing were also in use. Letterpress was almost completely monochrome in the first half of the century.

After the stimulation of the Great Exhibition in 1851, and also due to the better availability of coloured inks, new chromolithographic printing styles had begun to provide further opportunities for colour printers by the sixties. By this time, colour nature printing was being carried out in England. By 1857, the first experimental intaglio photomechanical colour printing had been accomplished in Britain and during the early sixties, early colour planographic photolithographic and photo-zincographic processes were in evidence, as new coatings became available and colour machinery was engineered.

Especially after James Clerk Maxwell's work in the eighteen sixties, scientific research had led to the development of simplified, more cost-effective colour processes, also associated with the ongoing development of coloured inks and the later inventions of screens and plates for process colour printing. Alongside, engineers were building suitable machinery for colour printing, which increased efficiency as steam power, introduced as part of the

industrial revolution, began to increase the commercial viability of the printing processes, including the colour photomechanical processes through the ability for increased automaticity and speed. As far back as the eighteenth century mechanical tint processes had been employed in Britain to partially mechanise both lithographic and relief block printing. In addition colour letterpress had been increasingly put to work for commercial textual and ornamental purposes from around the 1880s.

As the trend towards colour for the mass market tended to favour the photomechanical, and the older colour processes tended to wane, by the seventies, as planographic collotype and heliotype appeared, colour wood engraving diminished. By the eighties, the photomechanical trend favoured the relief methods that enabled the simultaneous printing of text and image to provide the lexivisual page, and by the middle of the decade it was the relief colour half-tone processes that eventually emerged in America. These methods reached Britain by the early nineties and became commercially viable there by the mid-nineties. In this decade also, planographic colour had become commercial in Britain via colour photo-chromolithography and collotype. As well, many other related colour processes were at least providing colour in an experimental way, and many combination processes were in use.

Just after the turn of the century, in 1905 the first three-colour gravure print had been produced, after which quality intaglio colour had become commercially viable in Britain through photo-gravure, although at first not widely available to printers. Improvements, such as those to machinery and colour plates, were opening further possibilities as three and four colour printing was developing for all the main processes, and by the second decade of the twentieth century, colour offset lithography opened wider opportunities to the British colour printer.

Over the second half of the nineteenth century, the progression of the photomechanical had gradually added experimental colour processes and new graphics printing methods for all the main processes, and by the end of the period under study, trial of such experimental processes in European countries, America and Britain, as well as in Australasia, meant that over the years, viable commercial photomechanical colour printing for relief, intaglio, planographic and combination processes had all become open to British printers.

By 1910, colour could be provided to the British marketplace of print, including to the mass marketplace, by means of a variety of processes in all the major printing styles from which printers selected what was appropriate to the particular job and print product. Although the

older processes such as aquatint and colour wood engraving were no longer used commercially, some employment of the chromolithographic processes was ongoing. Added to these was the growing number of photomechanical processes that by the end of the study period included relief colour half-tones, planographic photo-chromolithography and photo-collotype, as well as photo-gravure and many combination processes. In the early twentieth century, offset lithography, which had become well established in Britain by 1914, presented further possibilities to the colour printer.

Which Processes Were Taken up by New Zealand Printers, Which Ones Were Not, and Why?

Planographic Colour Processes

As seen in previous chapters, well before the commencement of colour printing in the colony, lithographic presses were present in New Zealand, for instance, the press that had been introduced from Britain in the thirties and one that was built in situ in Wellington in the early forties to serve a pressing need for graphics printing. In the absence of the development of a local colour intaglio tradition, the requirement for local graphics printing centering around the need for local maps and plans, particularly to facilitate land subdivision and sale, had led to widespread use of the lithographic processes in New Zealand. For such local graphics production these processes had quickly become dominant, but when more elaborate mapping and/or traditional intaglio plate engraving was required, much work continued to be repatriated. Maps produced locally in New Zealand by lithographic methods were an important genre over the period to 1914. The early use of hand-colouring for many of these items, feasible in New Zealand only if long runs were not intended, demonstrated that facility to not only print in black and white, but also to add the colour locally was deemed desirable.

The inherited tradition of depicting the environmental surroundings in colour as paintings, some of which were later translated into coloured prints, had sometimes led to early local attempts to employ colour printing processes for reproductive purposes, such as for the tinted lithographs printed in the *Southern Monthly Magazine* and in the Julius Haast 'Report on the Headwaters of the River Rakaia' in the sixties. For such reasons, in New Zealand the stage had been set for lithography to become the major technology used to accomplish printed colour for such items as locally produced maps, plans and prints.

By the time New Zealand printers had become established in business, lithography, including tint lithography and chromolithography, was well rooted in Britain, and power presses to speed production, in use for lithographic printing in the fifties, were more

common there by the seventies. A steam-powered press had first been introduced in Wellington for official purposes by the Government Printer in 1866. The simpler tint lithography and early attempts at chromolithography, which had first been tried in the early eighteen sixties by Ward and Reeves and established by 1865 were the first colour processes to have been taken up by New Zealand printers. Once adopted, these were the colour printing processes coming into more widespread use as immigrant lithographers arrived, particularly in the South Island at the time of the gold rushes. (See also chapter 7.)

Naturally, the now New Zealand printers who had emigrated from Britain tended to continue to follow the general practice of their British counterparts, as did Australian printers who came from Britain, and much New Zealand development consequently tended to follow British trends. Graphics printing methods continued to be imported into New Zealand in a once-removed way through Australia as had been the case for the process of zincography which Thomas Bluett from Tasmania had used in Wellington by 1841, and for the early photolithographic transfer methods which Herbert Deveril had brought from Melbourne in 1873. Although Bluett had returned to Tasmania, where his early colour printing had taken place, both these processes were foundations for later planographic colour printing practice in New Zealand. Hebert Deveril apparently had taken this extra step by 1876 to print coloured maps, the year after the publication of his paper on the subject. The occasional influence that was coming directly from the continent was consonant with Old World graphic fashions of the times—for example the colour printer John Schmidt who had had arrived from Germany executed early local chromolithographs on the west coast at the end of the eighteen sixties.

Later, as can be observed by examination of print products from the period, New Zealand chromolithographic style developments tended to follow British trends, as chalk-style lithography gave way to stipple lithography and overprinting of several colours on a key impression, especially for reproductive work, was taken up by the seventies. (See also section V.) By 1890, after the introduction of collotype, the related heliotype process was apparently in use for colour printing in the North Island. Use of mechanical tints for colouring lithographed items was also in evidence by the 1880s, and around the end of the nineteenth century combination methods were also taken up, such as those in which lithographic colour was employed to colour a relief half-tone or collotype key.

However, the colour offset lithographic processes that were introduced in Britain by the end of the first decade of the twentieth century, a major innovation, were not adopted in New

Zealand until after the study period. Although Frederick Sears had lived and worked in Australasia, both in Australia and then New Zealand, in this case colonial conditions had not favoured such an advance on Antipodean shores. It appears that the practical needs of the colonial lithographic workplace had not been able to provide Sears with an environment conducive to the development of his innovative photographic interests, and it was rather to be in England, in the early years of the twentieth century, immediately after his New Zealand phase, that his work had borne fruit. The fact that offset machinery was not imported into New Zealand until 1913 was a limiting factor retarding the adoption of offset colour here. The first appearance of offset printing had not been until 1914, although I have not verified whether this had employed colour in a form other than the tonal variations available on the grey scale as seen in typographic work in black and white.

Relief Colour

In colonial New Zealand, the dominance of newspaper printing had dictated that most printing plant was set up for simple textual letterpress printing. This had enabled printers to employ the relief processes to hand to add printed colour to many of the ephemeral products that were produced through the associated jobbing printing, following the trend towards ornamentation in letterpress colour that had appeared overseas. From around the late seventies and early eighties colour letterpress was being more commonly employed in New Zealand for such work, and ability to provide simple two- or three-colour letterpress using relief types, rules and ornaments increased. Between 1887 and 1897, the appearance of advice and examples in locally available trade journals such as R.C. Harding's *Typo* and in others from overseas such as the *British Printer* had given such typographic colour a boost, especially in the jobbing area. Once again, New Zealand printers were looking to overseas models, with R.C. Harding advising on the best to hand, often using examples from Old World printing centres. However, increasingly, examples from America and some local examples were being pointed out by Harding, including his own *Typo* colour title-pages.

The way in which photomechanical relief processes had been implemented in New Zealand had also tended to follow British patterns, which were in turn following American and continental trends. By 1898, tri-chromatic half-tone printing, first invented in America, had reached New Zealand. As reflected in *Typo*, by this time, trends in printing were becoming more international. The first New Zealand three-colour relief methods had been developed in Christchurch in the latter half of the nineties, William Taylor, Ernest Moss and Alexander Wildey all having been involved in their production. Three colour half-tone zinc engravings were pioneered by William A. Taylor, the process printer who had learnt the trade from

John Taylor, his father, who in turn had gained his experience in graphics printing in Australia, and had been responsible for the first relief block half-tone printing in Christchurch. Ernest Moss had made three colour half-tone blocks around 1896/97, and these had also been used by Alexander Wildey for tri-chromatic printing at about the same time that Taylor's tri-chromatic half-tone printing had first appeared.

The reproductive relief colour woodblock processes do not appear to have been adopted in New Zealand as they were in Britain, although some use of these processes has been noted in Melbourne, and an example in New Zealand being possibly one of a few cases. (See chapter 11.) Because of limited demand for such work, skilled artists had not been tempted to begin business in colonial New Zealand. Although some local wood engraving had been accomplished to provide images for simultaneous printing with text for newspapers, and occasionally for books, such images had typically been printed in black and white, while it had been the lithographic processes that became the usual method used for adding colour here. Even in Britain, colour wood engravings had never been as numerous as chromolithographs for illustrative purposes, and by 1870 were declining in importance, just at the time that lithographic colour printing was spreading in New Zealand. In the relief branch of printing techniques, as well as typographical colour, it was rather the photomechanical half-tone processes that were to become established in New Zealand alongside lithography as the major relief printing methods that were to be future vehicles for colour.

By the end of the nineteenth century, the early colonial settlement period was over in New Zealand and many printing businesses were established. In a small remote population containing a dearth of expertise in the manual arts, it was natural that, in a print culture particularly oriented to letterpress, as printers strove to keep up with overseas developments in colour printing, for image printing, the relief processes that could be automated would be those that were more readily adopted. By the early years of the twentieth century, black and white 'process' printing had become an established area of New Zealand printing expertise, and commercial three and four colour processes had followed—at least by 1906 four colour processes had appeared.

Intaglio

From the beginning of graphics printing in New Zealand, the dominance of lithography had led to more uniformity in colonial colour printing methods than seen in Britain. In a printing environment in which much print production, intaglio map printing and early book illustration concerning New Zealand had all been repatriated, little substantial engraving for

colour intaglio printing had been accomplished in the early New Zealand print culture. Unlike the Old World, where there had been a history of intaglio image printing stretching back to the late fifteenth century, and despite the early use of intaglio printing for some stamp production, and the later use of rolling presses for proofing, New Zealand had not built any substantial local tradition of colour image and map production from the rolling press.

In the colonial climate in which printers were adopting the latest nineteenth century processes deemed suited to the satisfaction of the local colonial printing requirements, it seems that for commercial purposes, the old intaglio colour processes such as aquatint were not transferred to New Zealand soil. Baxter's combination process (already restricted in Britain) had not been practised in the colony, and throughout the study period bank-note colour printing had nearly always been accomplished overseas. Johann Degotardi, who had worked with Alois von Auer in Vienna, had taken up colour nature printing in Sydney, as evidenced by the 1861 example included with his published work *The Art of Printing* in which he had also described the process in detail. In New Zealand, nature printing does not appear to have been practised to any great extent although a form of it was tried by the Government Printing Office for the first issue of the three folio volumes of the *The Indigenous Grasses of New Zealand*, but other political priorities had apparently been precluded further such employment. (See chapter 9.)

The skills of the metal engraver had been of relevance in relation to job printing, when engraved steel dies had been used, for example, in connection with stamp printing, or to prepare transfer images needed for lithographic label printing. But by the end of the period under study, although copper-plate engraving had not been unknown in New Zealand, gravure plants had not yet been established. Although in Australia the first gravure plant, from R. Hoe and Company, New York, was operational at the Sydney *Sun* by 1916,¹²⁰ it was not to be until much later that a photo-gravure plant was established in New Zealand by Coulls Somerville and Wilkie, in Dunedin. Although Tolla Williment has said that "photogravure was the system of reproduction first used by Coulls, Somerville and Wilkie in 1914,"¹²¹ William Seeney, who was in charge of the lithographic section at that firm in the nineteen fifties, stated that one of the main reasons that gravure was not viable in New Zealand until much later was that gravure plate-making was a specialist job, and no-one in New Zealand knew how to produce a gravure plate.¹²² (See also chapter 12.) According to R.A. McKay's comment that "the latest system of reproduction to be practised in this country is photo-gravure, Messrs. Coulls, Somerville & Wilkie Ltd. having commenced

operations by this process in their Dunedin factory", ¹²³ such printing was present at least by 1940.

In New Zealand, Which Processes Were Adopted Quickly and Which Slowly: What Were the Reasons?

Time Lags and Colour Printing in New Zealand

During the period under study, it was the case, as stated in *Book & Print*, that in New Zealand "the technology of printing [was] entirely imported and all significant changes have been introduced from the European or North American places of invention."¹²⁴ In the area of advances in the technology of colour printing, this was also true to a large extent for that small corner of colonial endeavour, colour printing, where importation of basic technology, especially for the earlier manual colour printing, involved knowledge of complex art processes that were derived from the graphics printing and illustrative traditions of the northern hemisphere. These had at first often come to New Zealand from the parent British/European culture, sometimes indirectly via the Australian British colonies, perhaps speeding such transmission. It has been seen that this had occurred at times of important colour printing landmarks. (See figure 7.) However, distance, even from the Australian colonies, created a certain time-lag in a period when the only contact was by means of sea voyages. In spite of this much colonial effort had been directed towards keeping up as far as possible with new developments.

The Early Period

Although invented overseas, lithographic printing had been brought early to both Australia and New Zealand. By the mid nineteenth century this was the printing invention that was particularly topical in the northern hemisphere. In the early colonial period, when it had been the lithographic colour printing processes that were first adopted by New Zealand printers, it had been around twenty-five years between the first commercial British and the first New Zealand chromolithographic printing. Lithography had been tried in New Zealand in the eighteen thirties for Maori lesson sheets, and rapidly adopted after European settlement, especially for cartographic purposes. However, it had not been until around twenty years later that the first known lithographic colour printing had occurred in New Zealand, and soon after this the attraction of gold in the eighteen sixties had brought increased printing expertise, especially in lithographic techniques, sometimes including colour printing skills.

In the small remote New Zealand settlements, the ability of letterpress printing to supply major staple needs in the early establishment period of printing had dictated its primacy of place, and although lithographic means were secondarily acquired for graphics purposes,

most colour printing needs in this area were accomplished back in England, especially before local expertise was developed, and this had set a pattern. The adoption of lithography for some local graphic needs had reflected the fact that it was a more forgiving technique than engraving: it was easier to make a drawing on stone, easier to learn, and the hand-press could be adapted for small runs. Although in those early years, urgent local needs for colour in print products had sometimes been fulfilled by local hand-colouring, it is probable that in some instances such hand-colouring had been executed experimentally, to test the local market. However, teams of hand colourists traditionally used in Britain for executing extensive manual work of the kind do not appear to have been established in New Zealand.

Also becoming relevant to printing processes was the new invention of photography. On this side of the world it was to be expected that significant advances in the technical side of visual print culture would centre around combining photographic processes with the lithographic processes that were dominant means of graphics printing. As printing technology spread to the New World, so too did successive technological change, as printers followed developments of professional relevance and personal interest. As the pace of technological change quickened in the northern hemisphere, the southern followed suit.

Colour Technology Begins to be Adopted More Quickly

It is notable that Melbourne's John Osborne, as well as Herbert Deveril and Frederick Sears were all photographers as well as trained lithographers, and these were the innovators who all had made improvements to photomechanical processes that were later to benefit lithographic colour printing. First Australasian photographic links with Britain had come with Australia's first immigrant photographer Alfred Bock. In New Zealand, continued close allegiance with the mother country had meant that it was in Britain that the first early official enquiries concerning the desirability of employing photolithographic processes in New Zealand had been pursued in the early 1870s, helping to speed adoption to around fifteen years after similar investigations and use had begun in the British Ordnance Survey in 1855. Because experiments in this process had been conducted by John Osborne in Melbourne in the attempt to find a solution to a pressing need for successful local colour printing for geological maps, and by Colonel James in Britain at a similar time in the late fifties/early sixties, Australian photolithographic practice had at the time been abreast of that in the northern hemisphere.

By 1874, Herbert Deveril's improved photolithographic process had been officially adopted in Wellington for map and plan printing, and soon afterwards, at least by 1876, had underpinned the colour printing of such items in New Zealand. In Britain such a step had

been taken about sixteen years before, when Colonel James had first attempted photolithographic colour via a similar transfer process. It can be seen that within the confines of the New Zealand print culture, which was of lesser breadth in comparison to that of Britain, the adoption of graphics printing processes was nevertheless following the pattern emerging in the parent culture and elsewhere. As they became available and were adapted to relevant commercial colour printing needs, the newer photomechanical printing processes were being implemented both in Britain and in Australasia, including in New Zealand.

In the colonies it had been the presence of innovative individuals such as Deveril that had contributed to a shortening of the time lag that had usually existed between New Zealand and Britain for the uptake of colour printing associated with the related graphic processes developed in successive periods. But colonial moves to gain efficiencies for essential official practical printing work, driven by the important factor of official need had created limited official backing for experimentation in this area, consequently contributing to a speedier uptake of the early transitional photomechanical technology of photolithography than would perhaps otherwise have occurred. It had been this local need for efficient graphics printing processes, coupled with official backing that had first led to Herbert Deveril's New Zealand appointment. However, once needs were met, in the absence of private investment, official backing did not tend to finance further development which could then only occur overseas.

Collaboration

It can be seen that another catalyst had been fruitful collaboration, as innovative individuals worked with others. Such relationships included those sometimes developed with inventors in the northern hemisphere, an important instance being the liaison between Frederick Sears and Ira Rubel that furthered offset printing, although in this case Sears had by then left New Zealand. But sometimes innovation had resulted from trans-Tasman relationships. It had been because he too had worked in Melbourne that Herbert Deveril had known of John Osborne's photolithographic work, and was therefore able to improve upon it while in Wellington. Although, John Osborne had also eventually found it necessary to pursue his own experiments for colour photolithographic processes overseas, a benefit of his initial investigations on this side of the world was that Herbert Deveril's access to knowledge of the process had allowed the latest technology to be more readily begun in New Zealand.

Whereas around twenty five years had elapsed between the adoption of chromolithography in Britain and its first beginnings in New Zealand, the time between the commencement of

photolithographic colour processes in Britain and their first employment in New Zealand was at most sixteen years. By the seventies this also reflected the fact that initial founding of colonial infrastructure had been accomplished and that by then graphics printing at the Government Lithographic Press was well established and was serving many government department needs besides map printing. It had also been official need for greater efficiency that had led to the first introduction of steam powered presses in the Government Printing Office in Wellington in 1866. Although this was about fifty years after the debut of such presses in London for newspaper printing, it was only sixteen years since steam-power had first been applied to increase lithographic outputs in Britain, at about the same time steam powered presses had been first introduced in Melbourne in 1850.

Later Factors

By the eighteen seventies, although New Zealand print production was still much smaller in scale compared to that of Britain, the colonial expression of new colour printing technology was more likely to be found also within the areas of greatest volume printing and in the established printing strengths of jobbing printing that in turn was often associated with the newspapers, and this increasingly included letterpress colour, especially seen in locally produced ephemeral items. (These will be discussed further in the following sections.) Where it was perceived that colour could provide a market advantage, now that initial establishment was achieved, in New Zealand the time lag for the implementation of advantageous new processes was becoming less, as resident knowledge increased, as market pressures increased, and as institutions were established to give art and design training to those employed in industries such as printing where such skills were required. From around this time, apprentices had been more commonly trained in colour printing in local firms, and such institutional training would have provided supplementary knowledge. The will to keep up with trends was there, and no doubt this also made a contribution to a faster technological uptake.

Especially before the fully photomechanical processes became available, during the intermediate stage when colour lithographic transfer was employed in New Zealand, the means observed for adding colour in a mechanical way via prepared tints was also following British trends. The use of such tints to colour chromolithographs was in evidence in New Zealand at least by 1887, again around a decade and a half since their appearance in British colour work. As New Zealand colour printing was becoming more widely established, the change towards automation was giving printers not only a greater competitive advantage, but also the opportunity to diversify print products, especially

according to increasing local marketplace demand, in turn giving encouragement for printers to try new processes, pressures that also worked to favour a quickening of the technological pace.

Factors that had retarded earlier business development had been particularly the unsettled period in the North Island due to the Maori wars and the later unfavourable economic conditions that tended to inhibit the uptake of the more expensive graphics printing processes. Such economic problems were not confined to New Zealand shores. In 1889, R.C. Harding commented that "the New York *Daily Graphic*, the only illustrated daily paper in the world, is in almost hopeless difficulties. It has never been a financial success."¹²⁵ In the last two decades of the nineteenth century and beyond, the situation of New Zealand colour printers did not change in some respects: they still had the disadvantage of distance from the larger technical centres and of the smallness of the local market. Within the printing industry, compared with British conditions, New Zealand printers had to contend with a more basic infrastructure, difficulty in obtaining trained workers, and time delays in obtaining equipment, although towards the end of the century faster shipping was ameliorating this disadvantage to some extent, and for some essentials, such as presses and ink, closer Australian sources had been established.

However, as had been the case for all printing equipment and genre tradition from the time of the first missionary printing in New Zealand, print styles and requisites for the colour printer had continued to be imported mainly from Britain. By the eighties, some essentials such as presses were being imported also from Australia. In the Australasian colonies, especially in New Zealand, the relative isolation and slow communication of the times meant that those working with early applications of new technical developments to some extent had to 'make do' with the equipment to hand, or improvise.

Where developments for the colour printer depended on the presence of the heavy industries to supply the latest engineering innovations to have been incorporated into colour printing presses, New Zealand printers had to rely on developments being pursued elsewhere. Neither did they possess the economy of scale which made the purchase of the latest colour machinery as cost effective as it was in many northern hemisphere print cultures. It is indicative that machines such as the L.&M. Miehles, which had been available and had brought advantage to northern colour printers from the late eighteen eighties, were not imported into New Zealand until 1914. For a similar reason, although the introduction of planographic colour offset had occurred in Britain in 1909, due to the lack of the offset

press until the 1913, this process was not begun in New Zealand until the last year of the study period. Such retardants ensured that a certain time lag remained, although by the nineties, adoption of new methods had quickened as the photomechanical processes gained ground.

Graphics Printing Technology Becomes International

As in Britain and elsewhere, in order to cut the cost of supplying colour to the mass marketplace of print, it had been the relief processes which were explored in the last two decades of the nineteenth century in New Zealand for the accomplishment of printed tone values for image printing. As the photomechanical processes became more complex, colour printing trends were becoming industrialised in a more international fashion. The first major relief photomechanical colour printing process to arrive in New Zealand, as in Britain, was tri-chromatic halftone. After planographic colour collotype had been found too expensive and unreliable to be suited to the requirement for a process by which printers could fulfil the late nineteenth century mass market demand for colour, even in the smaller New Zealand setting a more efficient process was needed. In keeping with most previous colour printing trends, the initial place of development had been the northern hemisphere, from whence techniques spread to New Zealand, but again this technology initially came to New Zealand via Australia. This time the invention that allowed a colour printing process to become commercial had been first developed in America, although much experimental contribution had come from the continent, as colour printing techniques were becoming more international. These relief colour processes then spread elsewhere, including to Britain.

Relief colour half-tone work began in Britain around 1892, and in New Zealand around 1898, the shortening of the timelag between the two countries being due perhaps to many reasons, among them the fact that relief blocks in black and white had proved their worth in providing efficient simultaneous text and image printing everywhere. Within the New Zealand letterpress environment three and four colour half-tone printing processes followed, as had occurred in the northern hemisphere. Local collaboration had played a part, and international trade journal discussion of such processes was becoming more readily available. Although it is possible that many colonial printers did not access such material, there is much evidence that many did, and those involved in adopting the latest processes may well have been among those who took advantage of the literature to hand, as did John Osborne, including that published locally in *Typo*. From the fact that New Zealand printers were contributing examples of their colour work to publications such as the *Penrose Annual* is evidence that they were taking note of graphics developments being transmitted in this

way, and the inclusion of some of the work of Antipodean printers helped to forge further links between colonial and parent print cultures.

Through personal contact, the visiting Penrose commercial travellers by this time facilitated access to such knowledge and also to equipment sold by the company for process work by the company in Britain, for which a catalogue was available—a symbiotic relationship such as this was promoting process work. Such re-inforcement of New Zealand cultural ties with Britain was a factor that increased the likelihood that technology and equipment would continue to be sourced in Britain, although by this time, colonial printers were travelling to other places, including to Australia and America, in search of process expertise.

Advertisements for the supply of equipment that were placed in local journals such as *Typo* and overseas journals circulating in New Zealand facilitated the sourcing of colour printing technology. Advertisements directing colonial printers to British sources were boosted by those that were placed by agents acting in New Zealand for British firms. From a study of such advertisements in *Typo* in the period of the late eighties, (to be discussed in chapter 7), when New Zealand colour printing was coming into its own, the greatest number were seen to be from British firms, another factor reinforcing British patterns in New Zealand.

As the new photomechanical methods were altered and improved, the major location for further experimental development, such as the gradual improvement of plate-making processes and the engineering of enhancements for colour printing machinery, was the northern hemisphere; increasingly in America as well as on the continent and in Britain. Just before the close of the period under study, in the 1912 *Times* Printing Number the opinion was expressed concerning the future of colour printing processes that:

The reasons why letterpress and lithography, collotype and lithography, and photogravure and collotype have not attained a synthesis are not technical, but merely emotional. A new technical tradition, free from all shop and departmental prejudice, has for itself a great future. Given our hypothetical "Presiding Genius," and a generally diffused higher standard of taste among the workers, we should pronounce the future of colour printing to be very bright indeed.¹²⁶

It is notable that the spread of the major colour printing processes to New Zealand from their places of invention appear all to have first come to New Zealand from Australia with printers who had previously worked in Melbourne, a city in which business and industry had been stimulated by its proximity to the lucrative Victorian gold-fields where there had been a population explosion. Art-based chromolithography appears to have been brought to Christchurch in the sixties with Henry Glover, in the seventies the photolithographic processes that John Osborne pioneered in Melbourne underpinned the transfer colour methods (that were intermediate between the manual and the fully photomechanical) that

had arrived in Wellington with Herbert Deveril, and in the nineties John Taylor from Melbourne was the instigator of the photomechanical relief half-tone processes that were later developed for colour in New Zealand by his son William. That earlier established larger colonial neighbour in which printing was also initially a British inheritance but where cross-fertilization had occurred as skills had arrived with immigrants from other places continued to act as an important source of printing expertise throughout the study period. However, much resident knowledge among printers in New Zealand had continued to come also from Britain, and it was the gradual accumulation of expertise that also contributed to faster adoption of the newer commercial colour processes.

¹ R.A. McKay, ed., *A History of Printing in New Zealand 1830-1940* (Wellington: R.A. McKay for the Wellington Club of Printing House Craftsmen, 1940), 120.

² A.A. Smith, *Printing in Canterbury: A History of Newspapers and Printing Houses of the Province from Earliest Times* (Christchurch: Christchurch Club of Printing House Craftsmen, 1953), 47.

³ McKay, ed., *A History of Printing in New Zealand 1830-1940*, 120.

⁴ Geoffrey Wakeman, *Victorian Book Illustration: The Technical Revolution* (Newton Abbot: David & Charles, [1973]), 113.

⁵ *Typo*, 4 (May, 1890): 59.

⁶ Tolla Williment, *150 Years of Printing in New Zealand* (Wellington: Government Printing Office, 1985), 33.

⁷ Thomas W. Gudgeon, [another ed.], *The Defenders of New Zealand; Being a Short Biography of Colonists who Distinguished Themselves in Upholding Her Majesty's Supremacy in these Islands* (Auckland, H. Brett, 1887).

⁸ McKay, ed. *A History of Printing in New Zealand 1830-1940*, 105.

⁹ *Typo*, 8 (January 1894): 7.

¹⁰ John Arnold, 'Printing Technology and Book Production', chap. 6 in Martyn Lyons, and John Arnold, eds., *A History of the Book in Australia, 1891-1945: A National Culture in a Colonised Market* (St. Lucia, Qld.: University of Queensland Press, 2001), 104.

¹¹ P.T. Fitzgerald, 'The Printers of Melbourne', quoted by John Arnold in 'Printing Technology and Book Production', 104.

¹² R.A. McKay, 'Process-engraving', in *A History of Printing in New Zealand 1830-1940*, 120-126.

¹³ *Typo*, 4 (November 1890): 135.

¹⁴ McKay, 'Process-engraving', 120.

¹⁵ *Ibid.*, 121.

¹⁶ Smith, *Printing in Canterbury*, 47.

¹⁷ *Ibid.*, 48.

¹⁸ McKay, 'Process-engraving', 123.

¹⁹ Smith, *Printing in Canterbury*, 48.

²⁰ McKay, 'Process-engraving', 123.

²¹ Smith, *Printing in Canterbury*, 32.

²² *Ibid.*, 32-33.

²³ *Invicta News*, 1 no.5 (December 1947): 78.

²⁴ John Gregory and R.V.S. Perry, 'History of Otago Printing 1849-1937', unpublished manuscript (Dunedin: 1957), chap. 5 pt. II, 4.

²⁵ McKay, 'Process-engraving', 124-5.

²⁶ *Ibid.*, 124.

²⁷ Alexander Bonar Fleming founded this printing ink firm in 1852. R.C. Harding commented in 1887, the year of Fleming's death: "He must have possessed rare business gifts, as the factory, established in 1852, is the largest of its kind in the world. He will be much missed in Edinburgh, where his handsome fortune was freely distributed to public and private charities." In *Typo*, 1 (1887): 80.

²⁸ C.G. Zander, 'The Capabilities, Progress and Future of Three-colour Printing', in the *Process Year Book for 1897*, 62.

²⁹ W.A. Taylor, 'Early Process Engraving', chap. 4 in Smith, *Printing in Canterbury*, 48.

- ³⁰ *Typo*, 1 (December 1887): 95.
- ³¹ W.A. Glue, *History of the Government Printing Office* (Wellington: Government Printer, 1966), 56.
- ³² McKay, ed., *A History of Printing in New Zealand 1830-1940*, 122.
- ³³ *Typo* 8 (1894): 1.
- ³⁴ *Penrose Annual*, 7 (1901/02), 144.
- ³⁵ *Penrose Annual*, 10 (1904/05), 88.
- ³⁶ *Penrose Annual*, 7 (1901/02), 144.
- ³⁷ R.M. Burch, *Colour Printing and Colour Printers* (London: I. Pitman, 1910), 254-55.
- ³⁸ *Typo*, 1 (May, 1887): 32.
- ³⁹ Michael Twyman, *Lithography 1800-1850: The Techniques of Drawing on Stone in England and France and their Application in Works of Topography* (London: Oxford University Press, 1970), 57.
- ⁴⁰ McKay, ed., *A History of Printing in New Zealand 1830-1940*, 125.
- ⁴¹ Glue, *History of the Government Printing Office*, 131.
- ⁴² National Archives Head Office, Wellington. Government Printing Office. Correspondence Files, 'Frederick Sears, Photographer'. Reference, LS/1, 1338/26021, 19/12/1895.
- ⁴³ *Ibid.*, 10/8/1896.
- ⁴⁴ *Ibid.*, 14/9/1896.
- ⁴⁵ *Ibid.*, 1/2/1900.
- ⁴⁶ *Ibid.*, 22/11/1900.
- ⁴⁷ *Ibid.*, 15/3/1902.
- ⁴⁸ *Ibid.*, 21/8/1902.
- ⁴⁹ *Ibid.*, 3/9/1902.
- ⁵⁰ *Ibid.*, 16/10/1902.
- ⁵¹ *Ibid.*, 4/11/1902. Reply: 13/11/1902.
- ⁵² *Penrose Annual*, 11 (1905/06): 123.
- ⁵³ *Ibid.*, 121.
- ⁵⁴ *Ibid.*, 123.
- ⁵⁵ *Ibid.*
- ⁵⁶ Frederick Sears, 'Alzinography: Lithography of the Future', in *Penroses' Pictorial Annual*, 14 (1908/09): 20.
- ⁵⁷ *Ibid.*, 21.
- ⁵⁸ *Ibid.*, 20.
- ⁵⁹ The essence of the lithographic process involves chemical change in which the etching process produces sebacic lime: see the discussion of the process in volume 2.
- ⁶⁰ William Gamble, 'Modern Colour Processes', chap. 10 in R.M. Burch, *Colour Printing and Colour Printers*, 266-267.
- ⁶¹ Sears, 'Alzinography: Lithography of the Future', 20-21.
- ⁶² Encyclopedia Britannica, online, URL: <http://www.britannica.com>, 22 November 2000.
- ⁶³ Sears, 'Alzinography: Lithography of the Future', 23.
- ⁶⁴ William Gamble, 'Preface', *Penrose Annual*, 14 (1908/09), 4.
- ⁶⁵ Sears, 'Alzinography: Lithography of the Future', 22-23.
- ⁶⁶ Harold Curwen, *Processes of Graphic Reproduction in Printing*, 3rd ed. rev. and enl. by Charles Mayo (London: Faber, 1963), 65.
- ⁶⁷ Bamber Gascoigne, *How to Identify Prints: A Complete Guide to Manual and Mechanical Processes From Woodcut to Ink Jet* (London: Thames and Hudson, 1986), 1c.
- ⁶⁸ Gamble, 'Modern Colour Processes', 267.
- ⁶⁹ Burch, *Colour Printing and Colour Printers*, opp. 266.
- ⁷⁰ P.A. Griffith, Ross Harvey and Keith Maslen, eds., *Book & Print in New Zealand: A Guide to Print Culture in Aotearoa* (Wellington: Victoria University Press, 1997), 63.
- ⁷¹ McKay, ed., *A History of Printing in New Zealand 1830-1940*, 110.
- ⁷² Williment, *150 Years of Printing in New Zealand*, 65.
- ⁷³ Gamble, 'Modern Colour Processes', 257.
- ⁷⁴ *Ibid.*, 259.
- ⁷⁵ *Ibid.*, 260.
- ⁷⁶ Warren Chappell, *A Short History of the Printed Word* (New York: Knopf, 1970), 225.
- ⁷⁷ Griffith, Harvey and Maslen, eds., *Book & Print in New Zealand*, 61.
- ⁷⁸ Roderick Cave & K.A. Coleridge, 'For Gospel and Wool Trade: Early Printing in New Zealand', in *Printing History*, 13 (1985), 27.

- ⁷⁹ National Archives Head Office, Wellington, Patent Office, Black Folder, PC, Patent Design and Copyright, 'New Zealand Inventors Listing', 4.
- ⁸⁰ F. Matthias and John Gartner, *Historical Events in the Graphic Arts* (Melbourne: The Melbourne Technical College, Department of Printing, 1935), 17.
- ⁸¹ Geoffrey Wakeman, *The Production of Nineteenth Century Color Illustration* (Loughborough [Eng.]: Plough Press, 1976), 16.
- ⁸² Glue, *History of the Government Printing Office*, 38-39.
- ⁸³ Williment, *150 Years of Printing in New Zealand*, 44; and McKay, ed., *A History of Printing in New Zealand 1830-1940*, 44.
- ⁸⁴ McKay, ed., *A History of Printing in New Zealand 1830-1940*, 103-4.
- ⁸⁵ On display at the 'Printers Shop', the Ferrymead Historic Park, Christchurch.
- ⁸⁶ *Typo*, 5 (1891): 104.
- ⁸⁷ McKay, ed., *A History of Printing in New Zealand 1830-1940*, 110.
- ⁸⁸ John Feather, *A Dictionary of Book History* (London: Croom Helm, c1986), 144.
- ⁸⁹ Twyman, *Lithography 1800-1850*, 151.
- ⁹⁰ W.C. Penfold, & Co. Ltd., *A Century of Progress in Printing: The Story of W.C. Penfold & Co. Ltd.* (Sydney: W.C. Penfold, [1930]), 23.
- ⁹¹ *Graphix: Bicentennial Supplement*, 11.
- ⁹² A.H. McLintock, ed., *An Encyclopaedia of New Zealand* (Wellington: Government Printer, 1966), 2, 871.
- ⁹³ Smith, *Printing in Canterbury*, 40-41.
- ⁹⁴ Griffith, Harvey and Maslen, eds., *Book & Print in New Zealand*, 66-67.
- ⁹⁵ *Ibid.*
- ⁹⁶ *Typo*, 1 (February 1887): 11.
- ⁹⁷ *Typo*, 4 (May 1890): 56.
- ⁹⁸ *The New Zealand Mail*, Christmas number, 1896, 53.
- ⁹⁹ *The New Zealand Mail*, Christmas number, 1896, 55.
- ¹⁰⁰ *Typo*, 5 (September 1891): 129.
- ¹⁰¹ Sir James Fletcher, interviewed by Sean Plunket on *Top of the Morning*, National Radio, 2nd December, 2000.
- ¹⁰² Concerning this matter Roderick Cave has addressed the following comment to me: "Australian types were made through the use of electromatrices, copying popular faces from overseas – a practice followed by almost all UK, American and continental founders as well." Written comment, August 20, 2002.
- ¹⁰³ K.I.D. Maslen, 'Victorian Typefaces in Dunedin, New Zealand', *BSANZ Occasional Publication*, no. 2 (1981), 14, referring to the *Colonial Printers' Register*, 2 (1881): 132.
- ¹⁰⁴ Dennis Bryans, 'Nineteenth-century Australian Type Foundries', in *BSANZ Bulletin*, 23 no.3 (1999), 166-168.
- ¹⁰⁵ *Typo*, 1 (December 1887): 91.
- ¹⁰⁶ *Griffin's Colonial Printers' Register*, November 16, 1880, 31.
- ¹⁰⁷ *Typo*, 2 (June 1888): 51; and 2 (March 1888): 18.
- ¹⁰⁸ *Typo*, 1 (May 1887): 32.
- ¹⁰⁹ *Typo*, 1 (June 1887): 41.
- ¹¹⁰ *Typo*, 4 (July 1890): 74.
- ¹¹¹ *Typo*, 5 (April 1891): 55.
- ¹¹² *Typo*, 3 (June 1889): 62.
- ¹¹³ *Typo*, 4 (May 1890): 53.
- ¹¹⁴ *Typo*, 4 (November 1890), 135.
- ¹¹⁵ *Typo*, 4 (August 1890): 93.
- ¹¹⁶ *Typo*, 5 (February 1891): 22.
- ¹¹⁷ McKay, ed., *A History of Printing in New Zealand 1830-1940*, 120.
- ¹¹⁸ *Ibid.*, 121.
- ¹¹⁹ *Ibid.*
- ¹²⁰ Otto M. Lilien, *History of Industrial Gravure Printing up to 1920* (London: Lund Humphries, 1972), 144.
- ¹²¹ Williment, *150 Years of Printing in New Zealand*, 33.
- ¹²² William Seeney, Interview, 26/2/99. Taped and used with consent.
- ¹²³ McKay, ed., *A History of Printing in New Zealand 1830-1940*, 110.
- ¹²⁴ Griffith, Harvey and Maslen, eds., *Book & Print in New Zealand*, 53.
- ¹²⁵ *Typo* 3 (1889): 31.
- ¹²⁶ *The Times*, Printing Number, 1912, 174.

SECTION IV

Colour Printers in New Zealand to 1914

CHAPTER 7

NEW ZEALAND COLOUR PRINTERS IN BUSINESS, ESPECIALLY FIRMS OF THE LOWER NORTH ISLAND

Research Questions:

4. *Who were colour printers in New Zealand during the period, especially in the Lower North Island, and did the nature of their career paths, skills and business aspirations typically diverge from those of their British counterparts during the period under study? If so, how?*

5. *What problems did the colonial New Zealand colour printers encounter compared with their British counterparts, and what solutions did they devise to overcome these problems?*

Quotation: The personnel of a colour printing establishment is the channel of technical tradition...¹

Introduction

From Gutenberg's time, printers had perceived that, if used appropriately, colour could be a popular element in the print product marketplace when used for graphics or decorative text. It was the perception of this desirability of colour that had led printers to make repeated efforts over the centuries to provide it. But the relatively high cost of colour printing stimulated effort to find less expensive means that would enable colour to be attractive yet affordable to diverse market sectors. As seen in section III, such inventive effort quickened in the later nineteenth century, as the development of viable mass market colour printing was progressively linked with photographic processes.

However, even when the processes had been developed, the achievement of quality colour printing depended on the ability of printers to successfully use them to achieve an edge in a more or less discriminatory market. The achievement of quality colour printing lay not only in the equipment available but also in the skills of tradespeople in whose hands that equipment could become an effective tool. Even by the end of the study period colour printing processes still required the ability and skill of the artist/craftsman, whether artist as creator of an original image, or as translator of an original to a printing surface. Important, too, was the typographical display work designer, whose abilities were necessary to successful typographical treatment and page-layout, as were those working in ancillary industries such as typefounding, ink and paper-making. As well as the acquisition of appropriate plant and knowledge of necessary processes, marshalling suitably trained staff

was an important task for a colour printer setting up in business. Once established, keeping in touch with both technical and market trends was vital to the future health of such a business. In the absence of such supporting local industries as ink-making or typefounding, importation of equipment and materials was a continuing necessity. In such circumstances, information concerning overseas sources and suppliers was essential, and trade journal advertisements, such as those in *Typo* helped to fill this need. As will be discussed below, a survey of the advertisements that appeared in *Typo* in its first two years was carried out to provide a snapshot of this aspect of the colonial colour printers' business. (See section below: Knowledge, Plant and Equipment for New Zealand Colour Printers.)

Although full colour printing in the form of chromolithography had not been established in New Zealand until around twenty years after European settlement, it will be seen that by the eighties the lead given by such printers as Ward and Reeves of Christchurch in the use of chromolithography in the eighteen sixties had been followed by printers in other parts of the country. By then chromolithography had been introduced as an arm of business in many firms, especially in the larger centres. However, chromolithography had begun in some smaller centres quite early, for instance in Nelson and Hokitika, both areas where gold had been discovered.

An overview of colour printers working in New Zealand in the first fifty years after the introduction of colour printing processes in the commercial arena will be given in this section, via a discussion of representative firms in business in the main centres. Particular emphasis will be given to firms in the lower North Island, with a case study highlighting A.D. Willis of Wanganui. Bock and Cousins of Wellington will also be given prominence because of their special place as printers of the late nineteenth century *Art Album of New Zealand Flora*, a publication that, for its locally executed colour printing, was unusual at the time.

New Zealand

Personnel: Artists and Tradespeople

As mentioned in *Book & Print*, until the later twentieth century there was a clear separation between the graphic and the typesetting processes within the New Zealand printing trades, and correspondingly between 'printing workers' and those who worked as lithographers or process engravers, as well as a division between composition and presswork in each.² A firm producing print products composed of both text and graphics therefore needed a variety of tradespeople in their employ, or working on contract. For example, especially before the advent of the photograph, a vital link in the production of printed graphics was

that between the artist originator and the artist committing the original to the printing surface, for example the chromolithographer who was essential to the task of translating the original to printed lithographic colour. Later the photographer became an originator, as the photograph began to provide a basic image from which a printed graphic could be created, so that photographic skills gradually became integral to the accomplishment of photomechanical colour printing of all kinds. This was true for colour printing in any country, including in New Zealand, where photography began to play an integral part in the production particularly of lithographed items.

Well-trained pressmen were also essential for quality print production whether of text or graphics. Thus the ability for a printing business to carry out colour printing partly depended on engaging the mix of tradespeople with the training to provide the particular expertise required for the manufacture of specific items from origination to finished product. Even in Melbourne, whence much printing expertise had arrived in New Zealand from the time of the gold rushes, trade classes for printers' apprentices had not begun until 1894, when they began to be held in the Atheneum in Collins Street, with classes commencing in 1899 at the Technical College, then known as the Working Men's College. In New Zealand, art and design subjects, of relevance to the display typographer and the lithographic printer, had been taught at the Dunedin School of Art since the early seventies. In 1882 a School of Art was established in Canterbury where training was given to the many tradesmen for industries requiring art knowledge. As time went on, the availability of readymade materials such as blocks and stereotypes potentially provided supplementation of, or substitution for the fruits of the work of some tradespeople such as engravers and artists, and the advent of process engraving was responsible for further changes in the commercial printing workforce.

New Zealand Artists and Tradespeople for Graphics Printing

Wood Engravers

In New Zealand, for the graphics printing required in general newspaper and periodical illustration which comprised the bulk of production, considerable use was made of woodcuts by printing firms, especially at first, and most of the English³ and Australian-made⁴ blocks were imported. Although most early printed graphics were printed in black on white paper, this production established procedures and methods later used for colour printing, although it was not to be colour wood engraving which caught on in New Zealand. That there were some competent wood engravers in New Zealand is evident from R.C. Harding's entry in *Typo* in December 1889. After commenting that the *Otago Times* had published an exhibition supplement with "portraits" of gentlemen connected with the

exhibition which he described as "hideous caricatures," he had pointed out that this was inexcusable, as "good wood-engraving can be done in Dunedin as in any part of the world."⁵ For instance, he had previously mentioned the Dunedin wood engraver Miss Maxwell favourably, reporting in 1887 that she had sent him work in different styles which he said were "all exceedingly good," showing both artistic taste and mechanical skill.⁶ However, with the new photomechanical processes coming in, the days of the wood-engravers were numbered, and by March 1891, a brief entry in *Typo* is indicative. Harding said that the Government had dispensed with the single wood-engraver at the GPO, the largest printing establishment in New Zealand, the reason being, that although he was excellent, his salary, at £3 per week was more than the country could afford.⁷ It is interesting that this wage was around the same as the ruling rate for compositors on time at the end of the eighteen fifties: quoted by McKay as being between £3 to £3 10s for the period (up to £4 for piece work). Peter Franks has discussed wages in *Print and Politics: A History of Trade Unions in the New Zealand Printing Industry, 1865-1995*, writing that in 1862

wages in Wellington were £2 6s for a 60-hour week. They were next increased to £2 8s but the standard of £3 a week (which was paid in Auckland) was not established until 1865 when Wellington became the capital and the Government Printing Office was moved there from Auckland.

Franks makes the point that in gold mining areas printers had often received more, up to £12 or £14 per week.⁸ By the seventies wages were placed at £203 per annum on average (£3 18s per week) for a forty hour week at the Government Printing Office, a sum considered to be excellent for the times.⁹ In terms of the cost of the printing surface to be used by the printer, it has been said that in America the cost of a half-tone plate in 1890 was \$20 compared with \$300 to \$500 per woodblock.¹⁰

Artists/Lithographers

Since lithography was the major process used in New Zealand for nineteenth century graphics production, the lithographic artist who originated, analysed or transferred the image to the printing surface was an essential link in the production of a great number of locally produced images, whether commercial or not, and for colour work, the services of a trained chromolithographer were necessary. Writing in *Matrix*, Richard Russell has recently drawn attention to an article that originally appeared in 1948 in *The Studio* which likened the skills of the chromolithographer to those of the translator. In this case, the reference was to those who worked at the Willesden lithographic and offset printing firm of Chromoworks Ltd. in the nineteen forties. It was said of the chromolithographic craftsmen that

they prove that though lacking the stature of the commissioned artists, the latter owe them the debt which all authors must acknowledge to those able translators, who, while losing nothing of the original's vitality, represent it with complete mastery of the new language or medium.¹¹

Among early tradesmen arriving in New Zealand at the time of the eighteen sixties gold-rushes were those coming from places other than Britain, especially from Australia, but also occasionally from elsewhere, including from the continent. Among them had been the chromolithographer John Diedrich Schmidt from Bremen, who had arrived in 1860. Schmidt had been involved in the newspaper business before setting up as a printer and engraver on the west coast, subsequently being responsible for lithographic representations of New Zealand scenes, some in colour, including images of the west coast gold mining areas worked from artists' sketches that were published by Harnett and Co. in Hokitika, for instance, the 22 x 30cm. chromolithograph 'Okarita, a Digging Township...' that had appeared around 1869.¹²

It was in the eighteen eighties that the New Zealand cartoonist and lithographer Peter McIntyre began colour printing in Dunedin. In 1887 he made an early New Zealand reproductive colour lithograph entirely from the press, thought by Anne Kirker to perhaps have been the first such locally made print in New Zealand, after a painting by A.H. O'Keefe. About a year later he made the O'Brien reproductive chromolithograph alluded to in chapter 4. Having emigrated to Dunedin from Scotland, McIntyre was employed to draw characters of Dunedin for publication in the *Otago Daily Times*, and later, went on to produce "glorious theatrical posters for the Caxton Printing Company in Dunedin," for example, 'Ferry the Human Frog' and 'McEwan the Great Scottish Hypnotist,' both of which were chromolithographs designed by McIntyre.¹³

In New Zealand, although the first copyright legislation dates from 1842, it was not until 1877, with the passing of the Fine Arts Copyright Act, that provision was made for the registration of literary and other artistic works, although no records are extant before 1886. Further legislation was passed in 1896, 1903, and 1908, culminating in the New Zealand Copyright Act of 1913 which "consolidated legislation and brought it up to date."¹⁴ The question of intellectual ownership and the proper acknowledgement of originators of both images and written works was a topic receiving consideration during the period under study. From examination of print products from the period, it is apparent that at least by the eighties the lithographic artists employed in a printing business were often being acknowledged on the printed product, for instance, the names of the two artists, William Potts and Benoni White (who successively worked at the firm of A.D. Willis in Wanganui), usually appeared at the bottom of the chromolithographed items they produced. At the large newspaper printeries, the names of the chromolithographic artists appear less often, although, at the Christchurch *Weekly Press* for example, by 1898 the artist responsible for

the original from which a chromolithographic plate had been made was quite usually being acknowledged, and the name of the firm responsible for the chromolithography usually appeared also. For example, on the bottom left-hand corner of the cover of the 1898 *Weekly Press* Christmas number, the artist was acknowledged as "Phil R. Presants", while in the margin the company's name appeared as "The Christchurch "Press" Co. Ltd. Printers & Chromo. Lithos".

That the services of a good lithographer were valued, especially if photographic skills were also possessed, is indicated by the wage of £400 per year that was reportedly paid to Herbert Deveril at the Government Printing Office when he arrived in the seventies, as mentioned in chapter 5, even although this was considered to be high for the times. However, it had been common in the nineteenth century, especially in the colonial situation, that printers executed both lithography and letterpress, rather than specialising. In the December 1891 issue of *Typo*, R.C. Harding had commented that the fact that up until then many lithographers had been letterpress printers as well had meant that "lithographers have not been very largely represented in the trade press." However, in pointing out new lithographic journals, he said that this reflected the greater number of printers who were beginning to be specialists in one or the other: "the division-line is becoming more marked,"¹⁵ and possibly was a reason that some of the smaller newspaper firms were able to present special numbers in colour lithography from around that time, by outsourcing the work to specialist printers. (See chapter 10.) Such specialisation may also have been a factor in increasing the speed of new technology uptake.

Peter Franks has commented that in the first decade of the twentieth century, to protect against the proliferation of unskilled workers, several new unions were formed. Among them "separate lithographers' unions were...formed in Auckland and Otago."¹⁶ The first printers' union had also been established in Dunedin, probably in early 1862, the next in Wellington around 1865.¹⁷ Franks has also discussed moves that had been made towards federation in the early twentieth century:

In 1902 the Wellington Typographical Union voted to investigate forming a federation of the allied printing trades...with the object of gaining strength from a unionistic point of view and for mutual support. From the time they were formed, the printers' machinists' unions strongly supported amalgamation and one national federation. They also promoted amalgamation at a local level. In 1911 the bookbinders and printers' machinists in Christchurch amalgamated; a year later the Dunedin Printers' Machinists, Bookbinders, Paper-rulers and Lithographers' Union was formed.¹⁸

Photographers

Those responsible for photographs from which printed images were later published were also originators, who gradually began to be acknowledged in the publications in which their

work appeared. For example, the lift-out plate entitled *A Maori Princess*, in the 1898 *Weekly Press* Christmas number was stated to be reproduced from a photographic study by Barony, Auckland. Most of the other photographs used in that issue were simply marked 'Press' in white in the bottom corner, but occasionally a private photographer was acknowledged, such as one with "photograph protected – T.N. Horsley, March 5th, 1897" printed below it: some photographers were beginning to realise the value of their images. Photographs appeared to be covered by the copyright legislation. One freelance pictorial journalist who exhibited widely overseas, and who often had her work published in local magazines such as the *Auckland Weekly News* was Thelma Kent, a member of the Christchurch Photographic Society.¹⁹

Tradespeople and the Printing of Text

Compositors and Pressmen

Around the mid-seventies, a decade after the first introduction of chromolithography to New Zealand, a move to attract more printers to New Zealand caused suspicion that wages would be driven down, especially in the South Island where the gold boom had fired a temporary expansion. A letter that came from Wanganui that was published in the English trade journal the *Printers' Register* on November 6th 1875 was signed "Colonial Comp". Dated August 23rd, it is couched as a warning to would-be immigrant printers of prevailing conditions, giving some figures which state living costs and wages for the time:

Sir,- I see it mooted in some of our Colonial journals that it is the intention of the New Zealand Government to offer free emigration to a large number of printers. The question was first introduced by an M.H.R., who happens to be the proprietor of a large printing office in Christchurch, and who no doubt wishes to see the wages of compositors reduced – and this effected by introducing into the Colonies a great number of printers, half of whom must of necessity be idle during six months of the year.....This is the busiest time the printing trade experiences in the Colonies, and the last news from Christchurch and Dunedin showed that a large number of comps were hanging about the different offices, glad to get an hour or two of "grassing".²⁰

The figures given were:

Work wages	£2.10s to £3 per week
Rent	8s per week: a two-roomed cottage
	25s per week: board and lodging
Food	4½d: a 2lb. loaf
	2s/lb: butter
	6d: a glass of beer

The letter concluded with the advice from "one of their brethren in the art" to "stay at home", because in New Zealand over the last two to three years, many had abandoned the trade.

Subsequently, the financial depression, which had begun in the seventies and continued into the eighties²¹ had the effect of suppressing expansion, and many printing firms felt the pinch. During this period overall population increase was reduced, and in four of the years between 1878 and 1891 emigrants actually exceeded immigrants. In 1881 a New Zealand Typographical Association had been founded,²² and in 1890, master printers' associations were formed in Dunedin, Christchurch and Wellington.²³ At this time colour printing, which was expensive, was still very specialised. The potential was there, and although colour was gradually growing in its applications and being used more widely, it was not common in locally produced print products, in spite of the overall increase in printing output to meet the needs of the seventies and eighties. Elaborate colour printing remained costly because at this time it mostly remained essentially an art process, and New Zealand's still relatively small population meant that the local market continued to be too small to acquire the cost efficiencies of the larger overseas markets.

Decorative colour added by means of letterpress was a simpler way of adding the element of colour, and at the time was becoming a more common option, consonant with the New Zealand environment of jobbing printing and small-scale publication. An example of the effective use of simply printed colour from this period can be seen in the 1884 publication *To the Old Choir Boys of Christchurch Cathedral, New Zealand...* by William Elton, the precentor. This eighteen-page booklet, published at the Christchurch Times, was printed with the title page in red and black with a red cross at the head, and with all pages bordered in red. Rules were printed in red at the head of the main block of pages, with comments in black and the arms of the Cathedral in brown on the front pastedown.²⁴

Knowledge, Plant & Equipment for New Zealand Colour Printers

Especially for printers aspiring to the more specialised and costly area of colour printing, such business requirements as up-to-date plant and equipment, and ongoing trade information were more specialised and therefore likely to have been more difficult to access in a remote geographical locality. This was an added difficulty in an area of printing in which rapid change was also inhibited by the risk entailed in the high capital investment levels needed. In such a business environment, Robert Coupland Harding's journal *Typo* was an important source for colour printers, for whom it contained much specialised information. For instance, in volume 1 no.2 (1887) he had advised that Cattell & Co. of London had in stock "a capital selection of blocks" and that he had received a sample book of lithographic printing and chromo papers of excellent quality from Cowan and Co. in Edinburgh.²⁵ Harding's original writing on topics such as the elements of graphic design and

the laws of harmony and contrast were of especial importance to the colour printer, and his informed reportage and continuing type reviews provided critical instruction and information on a wide variety of printing matters. In addition, the advertisements that appeared in *Typo* indicate links between suppliers and printers.

These advertisements can give an insight into the equipment, educational matters and miscellaneous services that were available to meet the needs of printers in New Zealand at the time, including the colour printers, and represent a two-way communication between those who placed the advertisements, and the trade readers who could respond. To investigate this aspect further, a snapshot survey of all the advertisements that appeared in the monthly issues of the first two volumes of *Typo* has been taken to draw out such links within the trade from January 1887 to December 1888, just in the period that colour printing was beginning to be more widely undertaken by local New Zealand printers. The results are discussed below.

Advertisements in the New Zealand Trade Journal *Typo* 1887-1888

The communication and education that was vital to relationships within the trade was two-way within *Typo* in a geographical manner, not least by means of the advertisements that were being inserted from overseas establishments as well as from local New Zealand businesses and individuals with diverse interests vested in the printing industry. The survey illustrates that during 1887 and 1888, advertisements were placed from four geographical areas of the world: from Britain, the Continent, America, and Australasia. (Plate 11: bar graph 1.) Many of the advertisements were repeated, sometimes appearing in every issue. The total number for the two-year period, including repeats, was three hundred and nineteen. Of these, two hundred and seventy-one were from firms (as opposed to those in the nature of classified ads. from individuals who placed forty-eight.) Without repeats, the number from firms was fifty-three. For the following discussion, the counts refer to the total number of times the advertisement appeared, since repetition enhanced impact, and increased the likelihood of positive communication. This was standard practice also as far as the printing economics were concerned.

Of the twenty-two different firms that were represented by their advertisements for goods or services, fifteen were overseas firms who were together responsible for 30% of the advertisements, while 70% came from seven New Zealand firms. British firms placed the highest number of overseas advertisements. Almost as many British firms (six) as New Zealand firms were advertising and together these accounted for two hundred and sixteen of the advertisements that appeared in 1887-1888 from firms, one hundred and ninety-one

were from the New Zealand based firms and twenty-five were from the British firms, but it must be observed that many of the advertisements that originated from New Zealand were placed by firms that were agents for overseas firms, especially British firms. In fact, four of the seven local firms acted as agents for overseas firms, and one other, R.C. Harding's own Napier firm where *Typo* was printed until 1890, was advertising both as an agent and in its own right.

The larger number of advertisements from New Zealand reflects the fact that many of the local advertisements were repeated more often, typically in almost every issue. The locally sourced advertisements not unexpectedly included many from Robert Coupland Harding himself: in this two year period Harding placed ninety-five of the advertisements, twenty-six of which were for *Typo*. Individual advertisements of the nature of 'classified advertisements' for instance, 'wanted to sell' or 'job wanted', made up a further 48 advertisements of New Zealand origin.

R.C. Harding later noted that many of the colonial printers' brokers, "with two or three creditable exceptions", would not advertise in *Typo*, because of the feeling that Harding's articles on typography had brought about a closer relationship between printers and typefounders, thus encouraging direct dealing, breaking the situation in which "the colonial printer has been, in nearly all cases, entirely in the hands of the colonial agent."²⁶ Harding accused some of the colonial printers' brokers of trying to suppress the names of the manufacturers of types and machinery they imported, to prevent direct dealing. Many of the combinations which came to Harding hands, "the new products of about sixty different typefoundries [which were] regularly noted and criticised in our pages,"²⁷ he said had never been seen by the colonial agents, estimating that Australian and New Zealand printers knew of only about a quarter of these through the local agencies. However, Harding considered that the fact that some of these were now being used in New Zealand showed that *Typo* was doing a service to both printers and typefounders.

Although *Typo* carried advertisements in these two years from relatively few New Zealand printers in business at the time (from only seven of the around one hundred and thirty-five), and most of the local firms placing advertisements were New Zealand agents for overseas firms, this relationship reflects the fact that, nearly fifty years after settlement, New Zealand

Plate 11: Bar Graphs:

1: Overseas vs. New Zealand Firms Advertising in *Typo* 1887-1888.

2: *Typo* 1887-1888: Types of Advertisements of Particular Interest to the Colour Printer.

**Bar Graph 1: Overseas vs NZ Firms
Advertising in Typo 1887-1888**

**Bar Graph 2: Typo 1887-1888: Types of Advertisements
of Particular Interest to the Colour Printer**

printers, in a country largely economically oriented to primary production rather than to secondary heavy industry, still relied heavily on imported equipment and supplies. Of the fifty-six advertisements sourced from overseas other than from Britain, 21% were placed directly from a continental firm, while another five American firms were responsible for 41%, and three Australian firms for around the same percentage (38%). The total number of advertisements placed directly from Britain, America and Australia were of a similar order, most from Britain, slightly fewer from America and fewer again from Australia, although contact with British firms was increased by the advertisements from British agents in New Zealand. The kind of advertisements that appeared in *Typo* can be seen to cover many commodities and services of interest to the printing trade, and include those targeting colour printers as well as a few concerning the colour print products available.

Advertisements of Particular Interest to Colour Printing Firms

Many of the advertisements for general equipment and educative publications would have been of as much interest to the printer for whom colour printing was part of the business as those for whom it was not. However, a proportion of the 1887-1888 advertisements in *Typo* would have held particular interest for the colour printer: 31% of the two hundred and seventy-one, of which 10% were placed by overseas firms and 21% by local firms. (For the types of advertisements specific to the colour printer see plate 11: bar graph 2.) Of the four New Zealand firms other than R.C. Harding advertising as printers' brokers for overseas firms, two were agents for Edinburgh colour ink manufacturers; A.B. Fleming & Co., and Cowan & Co., the latter Dunedin-based firm being described as a 'New Zealand Branch'. These advertisements, which included coloured inks in a list of printers' supplies being advertised, featured regularly, making up the majority of the local advertisements: forty-six of fifty-eight.

Of the fifteen overseas firms advertising in *Typo*'s first two years, two of the six British firms were drawing the attention of the trade to aspects of their business particular to colour printers. One of these was the London and Provincial Printing Ink company, advertising its 'colored lithographic and letterpress inks' as a fullpage supplement with an illustration of the premises and a location map, as well as an inset printed in their Label Vermilion Ink, priced at 2/3d. per lb. for lithographic colour and 2/- per lb. for letterpress. (Plate 12.) This full-page advertisement particularly highlights their colour poster inks, all priced at 1s. 6d. per pound, and declared that "their qualities, considering the price, are really wonderful; indeed, they are quite suitable for the general run of a printer's work. It is not long since such inks would have been priced at twice or thrice as much." Attention is drawn to

coloured inks recently developed by this new ink firm – “they are of splendid brilliancy, and sold at remarkably low prices”, and a quotation from a notice in the *Printers' Register* of January 1888 is given as a testimonial: “....printers are under an obligation to it for providing them with several new and beautiful colours.”²⁸

Four advertisements were placed by the publishers during this period for the contemporaneous journal the *British Printer*, mentioning that it contained examples of colour printing:

The British Printer, a journal of the graphic arts.

Official organ of the British Typographia. Conducted by Robert Hilton.

Fine job supplements in monochrome and Colors. Fine Art Pictorial supplements

THE
LONDON & PROVINCIAL
PRINTING INK COMP^y

9 & 10 WATER LANE, LUDGATE, LONDON.E.C.

MANUFACTURERS OF
PRINTING INKS, VARNISHES,
DRY COLORS &c &c

TELEGRAPHIC ADDRESS "CULROSS LONDON"

SPECIMEN OF

LABEL VERMILION.

Litho. 2/3. L'press 2/- per lb.

STANDS VARNISHING.

MANCHESTER DEPÔT

21, CANNON STREET,

TELEGRAPHIC ADDRESS "CULROSS MANCHESTER"

BIRMINGHAM DEPÔT

43 MOOR STREET

TELEGRAPHIC ADDRESS "CULROSS BIRMINGHAM"

text such details as the kind of machinery in demand at the time:

Manufacturer of paper-cutting machinery, calendars, gold-blocking presses &c. At the forthcoming Melbourne Centennial Exhibition we shall exhibit for Mr. Karl Krause a large variety of his machines, for which we have lately opened up a large trade in these colonies, and which have everywhere given entire satisfaction. Illustrated catalogues and prices &c., we shall be pleased to supply to the Trade on application. Sole agents in Australia for: the Liberty Platen printing machine, Albert & Co.'s cylinder presses, &c. Woellmer's Typefoundry, Sacha & V. Fischer's wooden types, Berger & Wirth's Colored Inks, &c.³⁰

The mention of the fact that Australian firms now were buying from the German firm and that the machines could be viewed at a Melbourne exhibition soon to take place would have brought the possibility of seeing before buying from this source much closer to the colonial New Zealand printer, and indicates connections between the two southern hemisphere colonies via which such state-of-the-art printing knowledge was being diffused. Opportunities to further such relationships were enhanced by means of exhibitions such as this.

From pie diagram 1 (Plate 13) it can be seen that, over this two year period, many *Typo* advertisements indicated that future business with colour printers was intended. Frequently these drew attention to a firm's ability to supply coloured inks. For the colour printer, the quality of this essential commodity was crucial to the achievement of good quality colour printing, and was to become even more important by the late nineties when three-colour processes were beginning to be more commonly used. For New Zealand colour printers of the eighties, the nearest source of manufacture of this essential item was by this time in the neighbouring Australian colony: the firm of Frederick Berndt & Co. also advertised as agents for Berger & Wirths' coloured inks. However, Baber and Rawlings, Printers' Brokers of Auckland, advertising that they were agents for A.B. Fleming & Co. Ltd. of Edinburgh and London, had a high advertising profile. (It was Fleming's colour inks that were used for the colour printing carried by the *Penrose Annual*, starting with the first volume in 1895.)

Also of Edinburgh, Cowan and Co., papermakers, had a Dunedin branch, and this firm advertised that not only did they import printing machinery, type and paper, but that they held stocks of printing inks and paper of all kinds, thereby indicating that coloured inks were also readily available in the colony from this source. Thus firms with the ability to supply this essential commodity for the New Zealand colour printer were from all the geographical areas represented by *Typo* advertisements, implying complex business relationships and printers' networks that especially involved British firms or New Zealand agents for British firms, but from this survey it can also be seen that supplies and influence

coming from other countries, particularly from America and the continent were indicating an increasingly international network for the commerce of printing.

One of the two New Zealand colonial firms that did not advertise as representing an overseas concern was the Wellington auctioneer, Mr Sidey, who placed an advertisement announcing a sale of second-hand printing machinery to be held at his premises in Manners Street. This single advertisement was a one-off, but did include among the list of machinery for sale, a colour grinding machine, indicating that this was an item that had previously been imported by a New Zealand colour printer to make his own coloured inks. It is notable that the other New Zealand printer advertising, not as an agent for an overseas firm, but for himself, was the colour printer A.D. Willis who was located in the lower North Island in Wanganui. Over this two year period, Willis placed ten advertisements in *Typo*, the first of which appeared in the July 1887 issue, in which Willis gave his identity as ‘Chromolithographer and Bookseller’, thereby introducing himself to the printing world specifically as a New Zealand colour printer, and bringing attention to a variety of colour printed products that were executed at this firm.

As well as stating that he undertook colour printing for the trade, Willis’ advertisements were for his colour print products, many of which were of an ephemeral kind. In these two years these are the only firms that advertised products rather than equipment or publications (Plate 14: bar graph 3), although R.C. Harding did draw attention to his own letterpress colour printing capability through reference to *Typo*’s title pages, including those printed for the 1887 and 1888 volumes. R.C. Harding did reinforce Willis’ advertising effort with his own comment, and this appeared very soon after the first July 1887 advertisement, in the same issue of *Typo*. Although there were many lithographic establishments by that time, Mr. Willis, who devoted his personal attention and “considerable capital” to his printing, was, according to Harding, the only one in New Zealand at that stage to have “made any attempt at fine-art work.”³¹ That advertisements for the locally produced colour products from A.D. Willis of Wanganui are among the few of this kind may indicate an atypical business, one which will be discussed at greater length in the next chapter.

Following these first two years, over the years that *Typo* ran, advertisements changed,

Plate 13: Pie-Diagrams:

1. *Typo* 1887-1888: Segmentation of Advertisements of Particular Interest to the Colour Printer by Category.
2. *Typo* Advertisements 1887-1888 re Publications: Subject Matter.

Plate 14: Bar graph 3: *Typo* 1887-1888: Categories of Advertisements (Other than Publications).

**Pie-Diagram 1: Typo 1887-1888: Segmentation of Advertisements
of Particular Interest to the Colour Printer by Category
(85 of a Total of 319 Advertisements)**

**Pie-Diagram 2: Typo Advertisements 1887-1888
re Publications: Subject Matter**

**Bar Graph 3: Typo 1887-1888: Categories of Advertisements
(Other than Publications)**

especially in that many firms preferred to advertise in the illustrated colour supplements that were carried in later years. However, the mix of overseas and New Zealand firms represented by the advertisements continued. Although it can be seen from later volumes that some firms dropped out, including, for instance, A.D. Willis, others began inserting new advertisements after 1888. One of the New Zealand firms that had a high advertising profile from volume 3 (1889) onwards was the Wellington firm of Lyon and Blair, also known for colour printing. (See below.)

Processes, Presses, and Equipment for New Zealand Colour Printers

Book & Print has indicated the broad origin of the printing technology used by New Zealand printers, stating that "equipment and skills came directly from Europe... in particular from Great Britain, the colonial master, and also indirectly by way of Australia, the nearest colonial neighbour, and later on from North America." The observation was also made that: "The nature and extent of these importations into New Zealand have yet to be studied in any extensive and systematic way."³²

To begin to shed light in this area, for information available to colour printers in particular, (but also for printers in general) it is salutary to look further at the advertisements that appeared in *Typo* in its first two-year period by placing them into categories to facilitate an analysis of the goods and services that were advertised; mainly publications and printing requisites of all kinds. (Plate 14: bar graph 3). Since the period during which *Typo* was published roughly coincided with the period in which a sea-change to photomechanical processes for graphic printing was beginning in New Zealand, inevitably leading to the requirement for new materials and equipment, insight into such channels of communication and what was being promoted to printers at the time in this vital area can be gained.

Because their geographical isolation meant that, for New Zealand printers, visiting the northern hemisphere suppliers *easily* was out of the question, the trade journal information as to who could supply the goods and services necessary to operate a printing business was vital in the colonial environment, where, especially at first, there were no local industries manufacturing necessary equipment and supplies, although gradually some firms began to produce some items, for example by 1876 the Daily Southern Cross and Weekly News Co. Ltd, in Auckland was advertising that it was able to execute stereotyping for printers and advertisers.³³

Many of the advertisements in *Typo* were for publications, the largest category of which were for trade literature, most often mentioning general works, for example, the

advertisement placed by R.C. Harding headed 'Valuable Works on the Art and History of Printing, on Sale by R.C. Harding, Napier' which listed nine titles, and ended with "other useful works are on the way. Orders received and subscriptions taken for any book or periodical, English or foreign, relating to the trade."³⁴ Through Harding's mediation, the New Zealand colour printer had a source of information supply for both the general reference titles listed and to any that he specifically wished to order, and for the colonial printer publications such as these would have been in the nature of essential equipment, given the remote location from the main northern hemisphere printing centres of the world. That Harding also worked tirelessly to promote colonial printing can be seen from the advertisement for *Sell's Dictionary of the World's Press* which appeared in *Typo* seven times in 1888. It stated that this work

contains over 1300 large octavo pages. Advertisements in this work have a world-wide circulation. The publisher of *Typo* is authorized to receive Advertisements for this work, and will supply all particulars on application.

Of the one hundred and forty-three times in which publications were mentioned in advertisements, slightly over half (seventy-four) highlighted printing literature (including the *Typo* ads.), about twenty-nine were for New Zealand publications other than *Typo*, and the remaining forty did not specify, or were for other categories of publications. (Plate 13: pie diagram 2.) Such trade publications would have constituted an important educative medium in colonial Australasia, where there were no schools of printing yet in existence. As mentioned, in Melbourne trade classes for printers' apprentices did not commence until the nineties.

Global Communication: Printing Literature and Country of Origin

Printing literature that was being advertised in this two-year period was from Britain, America, the Continent and New Zealand, representing the same range of countries as those represented by firms in *Typo* ads, except that there was no printing literature advertised from Australia, although advertisements appeared for another Australian publication, the *Australian Journal*. The major advertiser of printing literature was R.C. Harding himself, advertising not only *Typo*, but frequently other works on printing: the list mentioned above appeared five times. Other than this, the printing literature that was advertised directly was most often a trade journal: from London, the *British Printer*, from San Francisco, the *Pacific Printer* and from Chicago, the *Inland Printer*. The trade journal literature was also frequently discussed by Harding in his regular column, 'Exchanges', when he referred to a wide selection which he also made available at his office to any members of the trade visiting Napier.

Available Printers' Requisites Included Inks, Presses, Paper, Blocks

From bar graph 2 (Plate 11) it can be seen that, other than trade literature, by far the most numerous subjects of the early *Typo* advertisements were, predictably, printers' requirements, and included all commodities and items of printers' equipment: types and type ornaments, printing inks, machinery, paper, stationery, and many other items, such as the blocks that were needed for graphics printing. Some advertisements did not specify, but merely advertised "all printers' requisites". However, in the main, items were spelt out.

The most frequently advertised commodities were types and ornaments, with printing inks not far behind, while printing machinery and paper also were often specifically mentioned. Many an ad. for printers' requisites such as machinery was given prominence by means of illustration, and in addition some of these, especially advertisements for coloured printers' inks, were themselves in colour. In this case the colour printing itself was used not only as an advertising tool, to catch the attention, but also acted as a sampler, as seen in Plate 12 showing colour 'Label Vermilion' from the London & Provincial Printing Ink Company. An example of an advertisement for types is that which appeared in 1888 from C. Morton, the London City Type Foundry, in volume 2 of *Typo*. Occupying a whole page, it gave prominence to Morton's as suppliers of fancy types, borders and ornaments, as well as Morton's new ornament book. All these items were likely to have been of interest to the letterpress printer executing display work, perhaps prompting him to try putting into practice some of Harding's advice on the subject, which included much for the printer attempting colour work of this kind.

Of the remaining equipment that was the subject of advertisement in *Typo*, brass rules and roller composition were categories that were mentioned frequently, as well as stationery, a great variety of which was produced for the job printer. New processes were not often the subject of advertisement, although the one that did appear during this time included colour processes. Under one of the less conventional *Typo* advertisement headings, 'Printers! Grab it Quick!', the advertisement from the Imperial Type Co. of Geneva, New York, declared:

Imperial processes of Patent Leather Block Printing. Most complete, cheapest and best. With the plain directions any person at all familiar with printing, can produce marvellous effects, equalled only by lithography.

Two of the five processes that followed were for the notice of colour printers:

The Imperial Rainbow Process, for printing any form of tint block in 1 or 12 colors, at a single impression, and on ANY press, bringing out exquisitely charming and delicate blending of colors, pleasing to the eye and always in demand, and executed so easily.

The Imperial Process of Color Mixing, for making tints and colors. Very useful and valuable.

Also directions for producing odd and unique affects with sand-paper, bookbinder's cloth, alligator leather, cork tint blocks, and hundreds of other hints worth knowing. Directions for the execution of all the above will

be found in Vail's Compendium of Pointers for Printers, price of which, (with samples) is only one dollar sent postpaid. The Imperial Type Company. Geneva, New York.³⁵

In the later volumes of *Typo*, special colour advertisement supplements appeared printed in deep red and aqua in which many of the advertisements occupied a third or a half page, and illustrations included, for instance, many of the printing presses available, all from overseas. Appearing in 1889, one of these was of particular interest to the colour printer advertised machinery. From the English firm of Payne & Son it highlighted cylinder machines, including single and two-colour printing machines. (See also plate 6.) Attention was especially drawn to a new feature: "all machines are fitted with new patent automatic cylinder check." In 1890, Furnival & Co., of London also began placing colour advertisements for machinery of all kinds in *Typo*, stating that they were "Printers' engineers to H.M. Ordnance Survey." When Harding's own Napier printing plant came up for sale in the same year, at the time of his move to Wellington, a large Furnival guillotine was amongst the items advertised. Later still, in 1893, Karl Krause of Leipzig placed an advertisement stressing that machines "now in stock ... can be furnished at once". The list included sixty-five gilding presses, seven steam gilding presses, twenty-five litho. hand presses and 3 litho. pedal presses.

Advertisements for coloured inks continue to be prominent in later *Typo* volumes. An advertisement in colour appeared in March 1889 from an old London ink company, Blackwell and Co., established in 1754, and now shipping to the colonies.

Printers' ink and varnish manufacturers....black ink for every class of work. Poster and fine colour ink of every shade. Blackwell and Co. supply many of the largest newspaper and book printers in Great Britain and the Colonies, numbering amongst the newspaper offices the London *Times*, which journal they have supplied for over a century.³⁶

A supplement appeared in May 1889 printed in lithographic inks in three primary colours plus black, from Coates Bros. & Co, Printing Ink and Varnish Manufacturers, again based in London, together with the prices of the inks used: Royal Blue Litho 3/6; Gold Chrome Litho 2/6; Commercial Black Litho 2/6; Brilliant Scarlet Litho 5/-.

As mentioned, the Wellington firm of Lyon and Blair began advertising in *Typo* in 1889. Their first advertisement emphasized that they were agents for both types and inks, including coloured inks, and was typical of firms advertising equipment and supplies for printers. Both these essential items were likely to have been purchased in an ongoing fashion by colour printers interested in keeping up with current trends. Economics was a real consideration, especially for those engaged in the relatively expensive pursuit of colour

printing. Being colour printers themselves, this was a factor clearly appreciated by Lyon & Blair, as indicated in that advertisement:

Lyon & Blair. Wellington. Booksellers, Manufacturing Stationers. Printers Brokers, Paper Merchants &c. Have pleasure in calling the attention of the printing trade and the general public to the following agencies which they hold for New Zealand.

Stephenson Blake & Co., Typefounders, Sheffield. A large and representative stock of their types always kept, and orders can be promptly filled, at prices which will favourably compare with those of any other Colonial House. For outfits or large founts, to be supplied direct from the Foundry, lowest prices and liberal terms can be quoted. Priced specimen-book of local stock forwarded on application.

Geo. Mather's Sons, Manufacturers of Printing Inks, New York. A large and varied supply of these inks stocked. News ink, in 56 lb. and 112 lb. casks, a specialty. Book, jobbing and litho, Fine and Extra Fine Colored and poster. These inks are admittedly the finest made for ordinary trade purposes – easy to work and economical in use. The 5d. news ink will go nearly as far as double the quantity of any other ink in the market at the same price. This news ink is free from grit, has a good body of color and is good enough for the bulk of ordinary jobbing. Lowest prices for yearly contracts, and special quotations for ton lots. Printing and Litho varnishes kept in stock.Large stocks of jobbing printings, writings, machine and hand-made book and drawing papers, Colored printing and cheque, envelopes in all quantities and sizes &c.³⁷

For the general image printer, some *Typo* advertisements mentioned process blocks, necessary for the letterpress printer wanting to print line and half-tone illustrations. It was not long after this period that such blocks were in service as the basis for the printing of images in colours. One of the largest English sources of the electrotyped blocks that were often imported by the graphics printer was Nops' Electrotpe Agency in London. An advertisement that appeared in *Typo* in September 1892, under the heading 'Fine Art Electrotypes', declared that designs were available for all kinds of work, ranging over about 3 million subjects, and that

in addition to designs kept in stock, cliches can be supplied from engravings (not covered by private copyright) in the *Illustrated London News*, *Graphic*, *Black and White*, *Pictorial World*, *Lady's Pictorial*, *Gentlewoman*, *Strand Magazine*, *Review of Reviews*, from other periodicals, leading book publishers and the principal foreign illustrated papers. All the blocks furnished by this company are of high-class quality.³⁸

Summary

It can be seen that advertisements for coloured inks were the largest advertisement category directed specifically at the colour printer. In the absence of any locally manufactured ink, this essential commodity had to be imported into New Zealand, and this was to continue for the greater part of the period under study. (See also chapter 5.) Much of the staple plant and equipment necessary to any printing business was needed equally by the colour printer, for example, types and ornaments, of which a greater variety would have been in use for the jobbing printing in conjunction with which colour was likely to have been used, for such items as Christmas and other cards, as well as posters, programmes and many other smaller items, for which, without extra outlay, the platen machinery on hand used in newspaper publishing could do double duty. Apart from those referring to trade literature, types and ornaments were the single largest category of advertisement that appeared in *Typo*, at least

during its first two years, and this was in keeping with the interests of the journal's publisher, Robert Coupland Harding whose articles on this important subject were a high spot in every issue.

Advertisements in the Later Years of *Typo's* Run

Often, advertisements appeared from firms whose types, borders, combinations and initials had been used to illustrate Harding's articles, sometimes printed in colour to demonstrate this side of design for the display printer wishing to see an example of the effect being discussed. Most of these colour-printed examples appeared in later volumes, when Harding was in Wellington. (See section below on Robert Coupland Harding, and chapter 12.) Harding himself was an agent for those typefounders manufacturing desirable novelties who had no other agents in the colony. From 1889 part of his own advertisement for *Typo* included the following:

Type Novelties

The publisher of *Typo*, being a direct importer can obtain for printers in this colony any of the novelties produced by American and Continental Founders who at present have no agencies in New Zealand. Printers calling at Napier are invited to inspect the files of trade Journals and the large collection of Type Specimens at the office of this paper.

Inventions and Designs

It being one of the objects of this paper to keep its readers abreast of the times in regard to all useful designs and new inventions, the Publisher inserts in *Typo* illustration of machinery and labour-saving devices, as well as new faces of type, initials, corners, borders, vignettes &c. forwarded direct, or to his London office... Foreign manufacturers sending such should note that types or electros are required to be to *English height*.³⁹

Perhaps it was hoped that the presence of a London office would encourage such contributions. By 1891 the advertisement appeared with the following addition:

Messrs. H.W. Peabody & Co., Boston, Mass., will receive sample parcels or specimens from American houses, and forward them through Messrs. Lyon & Blair, of Wellington, N.Z.⁴⁰

The Colour Printing Firms: Places Other than the Lower North Island

Some South Island Firms Executing Colour Printing

Ward and Reeves - Christchurch

By the late eighteen fifties, the population of neither Lyttelton nor Christchurch had been more than about 700, but these early settlements had supported between them three printing businesses, all of which were newspaper offices.⁴¹ It appears that jobbing printing was carried out within these businesses, and in fact A.A. Smith states that a handbill had indeed been the first printing in Canterbury, as it had been produced on the newly arrived *Lyttelton Times* press around the New Year of 1851, thus pre-dating the first Canterbury newspaper which was, however, published only a short time later in January. Other evidence of early Canterbury jobbing printing occurs within an inventory of equipment for the *Canterbury Standard* that was part of printer James Willis's lease of 1854: it contains the item '3 founts for Wood Jobbing Letter.'⁴²

Ingram Shrimpton, the proprietor of the thriving *Lyttelton Times*, had in 1856 “sold the copyright and the lease of property and plant for twenty years to Crosbie Ward and Charles C. Bowen for £5000.”⁴³ In 1861, Bowen’s interest was bought by William Reeves (1825-1891), and it was not long after this that Ward and Reeves had begun colour printing, winning a Bronze Medal for chromolithography at the 1865 New Zealand Exhibition in Dunedin. (See chapter 4.) This was the year that the *Lyttelton Times* became a daily, having moved in 1863 to a three storey building in Christchurch. Such achievement for this firm had come only fifteen years after the European settlement of Canterbury had begun. The Honorary Certificates awarded at the exhibition had both been designed by Ward & Reeves. The report of the jurors states that the firm was

the successful competitors for the premium offered for a design for the Honorary Certificates to be presented by the Commissioners to successful Exhibitors.⁴⁴

The award certificates were themselves examples of this enterprising firm’s chromolithography:

The reproduction of the original by Chromo-lithography was also entrusted to them, and both the original design and the chromo-lithographs of it reflect great credit on Ward & Reeves, and have elicited warm praise from all quarters.⁴⁵

However, examples of the certificates do not appear to have survived.

Crosbie Ward (1832-67), who had been educated at Trinity College, Dublin, had emigrated to New Zealand in 1852 on the *Stag*, and was a member of the Provincial Council from 1855 to 1857, and of Parliament from 1858 until his premature death in 1867. During his term of office he had served as both Postmaster General and Secretary for Lands.⁴⁶ William Reeves (1825-91) who had come out from London in 1857, brought a sound business sense to his partnership with Ward.⁴⁷ In addition to the 1865 awards for colour printing, R.A. McKay mentions that Ward and Reeves had won a First Award for a certificate design at the Tasmanian Exhibition. The chromo-lithographer responsible for this successful early New Zealand colour printing in connection with both awards was Henry Heath Glover who also designed the Honorary award certificates for the 1865 exhibition. It is recorded in the *Reports and Awards of the Jurors* that a bronze medal was awarded to H.H. Glover “for his design for the “Honorary Certificates” of the Exhibition.”⁴⁸ This was a further honour that his employers wished to emphasise: it is also noted in the *Reports* that “Messrs. Ward & Reeves, in acknowledging the award of this premium, request mention to be made that the merit of this design is due solely to Mr Henry Heath Glover, a lithographic writer in their employment – ED.”⁴⁹ This note constitutes evidence that Glover was a member of the staff rather than working on contract.

After the death of his mother, Henry Heath Glover junior had emigrated in 1848 with his father and brother, initially to Adelaide in South Australia, but, after a stint at the Victorian goldfields, after his marriage, had settled in Melbourne where he worked as an engraver and lithographer at the firm of De Gruchy & Leigh for three years in the late eighteen fifties. Some of his sketches from that period were published in Melbourne. Glover had received his early training in Surrey in England, first as an apprentice to his father, Henry Heath Glover, the painter and lithographer, and afterwards under the London lithographer Reichert at Kohler & Co. Before emigrating he had been in the employ of the lithographic firm Dean & Sons of Threadneedle Street. In 1864, Henry Heath Glover had moved across the Tasman to Christchurch to take up the position with Ward and Reeves as head artist at their newly established Lithographic Printing Department. During his time in Christchurch Glover had also contributed illustrative cartoons to *Canterbury Punch*.⁵⁰

In their report on engraving and ornamental printing, the 1865 jurors commented on exhibits 448 to 451 from Ward and Reeves, saying that they were “in every respect of great merit, and would bear comparison with the productions of London engravers.” Special mention was made of their exhibit 451, ‘Illustrations of Chromo-lithography,’ of which they said: “Ward and Reeves show also examples of Chromo-Lithography, including an interesting series representing the various tints printed from the separate “stones”, which, combined, form the perfect picture.”⁵¹ Such comment confirms that this pioneering colonial firm were using the traditional processes, building the chromolithograph by successive printings from stones each bearing a single colour. For this display, Ward and Reeves had themselves gained an Honorary Certificate. However, at the end of 1868, the year after the death of Crosbie Ward, after only three years in New Zealand Henry Glover had returned to Melbourne where his expertise as a colour printer was again acknowledged when “his chromolithograph, *Three Maries* (after Annibale Carracci), obtained first prize at a subsequent Melbourne exhibition.” After a period in the employ of the Melbourne firm of Fergusson and Mitchell, he became chief draughtsman and manager of the Lithographic Department at S.T. Leigh and Co. in Sydney, and later worked for the Philip-Stephen Photo-litho Company, Ackhurst & Co., and David James and Co., as well as working on his own account, remaining in Sydney until his death in 1904.⁵²

It had not been until the prosperity of the sixties that New Zealand printing businesses such as Ward and Reeves had been able to flourish, and in this case to execute more costly colour printing. That Reeves was an astute businessman and an innovative one is borne out by the fact that he was responsible not only for establishing the conditions under which some of

the first chromolithography in the colony had been executed, but also, after the death of Crosbie Ward, for the introduction of both web-printing and stereotyping into the *Lyttelton Times* plant.⁵³ During their relatively short partnership, Ward and Reeves had been active in more than one area of early New Zealand graphic printing, having turned out maps and plans as well as prints. For example, prints and maps from this firm, whom E.M. and D.G. Ellis have said were “perhaps the most technically advanced lithographic printing firm in New Zealand at the time”⁵⁴ were included as a part of reports produced for official purposes.⁵⁵ Although R.A. McKay states that Ward and Reeves’ plant consisted only of “a hand-press larger than a quad-crown and a few smaller presses”, the Wharfedale cylinder presses suited to lithographic printing had been brought to Canterbury in the eighteen-sixties, and would soon have begun to facilitate such colour printing. (See also chapters 9-11.)

Whitcombe and Tombs - Christchurch

In the seventies there had been an explosion of population, with 200,000 emigrants arriving in New Zealand, and in this decade also, in 1877, the Education Act was passed to make it mandatory that children attend primary school. Both these factors meant that more printed matter, especially reading matter, was needed, and this gave the printing industry a boost, and the eighteen eighties was to be a period in which especially the Christchurch firm of Whitcombe and Tombs began to expand its local book publishing. In the 1880s there had been relatively few substantial books produced within the European strand of print culture in New Zealand, compared to the British production, and even fewer books for which colour plates were produced locally. As mentioned, Peter Hughes’ findings have shown that to 1889, one in three of the items recorded in Bagnall had been pamphlets. The staples of the early New Zealand commercial printing houses directed towards this market sector had been the twins of newspaper and jobbing printing.⁵⁶

The Canterbury settlement had always held education in high esteem. In the 1900 Jubilee Number of the *Weekly Press* it was pointed out that many of the original British colonists (who wished to be distinguished from the mass “emigrants” because they mostly belonged to the “gentry class”) had been attracted to Canterbury by “the religious and educational provisions” there.⁵⁷ Canterbury had been the first province to make education undenominational, and by 1863 had appointed a Board of Education. In 1864 local school committees had been invested with “authority to levy a school rate for the purpose of raising in each district a quarter of the cost of its school.”⁵⁸ Canterbury College had been established in 1873, and by 1882 the School of Art which by 1900 had two hundred and

fifty students, of whom it was said that “over seventy-five percent of these are young tradesmen engaged in industries in which a knowledge of the principles of art is valuable.”⁵⁹ By 1906, the Public Library was considered to be “for its purpose, superior to anything else of the kind in New Zealand.”⁶⁰

In such a climate, Whitcombe and Tombs, first established in 1882 when it was registered under the New Zealand Companies Act, and which in time was to become a New Zealand household word, saw its niche in the field of educational books for the local market, items for which they had almost immediately seen an opportunity for printed colour, producing, for instance, colour printed maps for a school geography book in 1884. (See chapter 9.) This firm gradually increased its interest in this field to include the supply of school texts and children’s books with New Zealand content. George Hawkes Whitcombe, who at the time was a French teacher and who brought to the partnership his great interest in books, joined forces with the printer George Tombs and opened the business in Cashel Street. In England, before the Copyright Act of 1709, when works had been subject to piracy by printers, it had been unusual for books to be sold away from the few shops under the control of the printer/publisher. After Copyright, the book trade activities of publishing, printing and bookselling had begun to separate into the several trades, so that by the time the settlers left for New Zealand this pattern was well established and “the foundation had been laid for many of the large English publishing houses...”⁶¹ In the sparsely populated colonial situation, as local printing and publishing developed, the old pattern of one firm performing all the functions of publisher, printer, and bookseller re-emerged. The partnership between Whitcombe and Tombs exemplified the efficacy of such a reversion, and in this case the association between printer, publisher and bookseller brought about by their joining forces led to a thriving long-lived firm.

At the New Zealand Industrial Exhibition of 1885, in the class devoted to “Apparatus and processes used in papermaking, dyeing, printing, stereotyping, engraving and lithography”, Whitcombe and Tombs was awarded first prize for letterpress printing, and second prize for lithographic and ornamental printing, as well as for engraving and die-sinking.⁶² Their letterpress printing was said to be characterized by clearness, variety of type and judicious combination, while the specimens of lithographic drawing and printing, die-sinking, engraving on steel, and embossing in gold, silver and colours...were all commended. It can be seen that within this firm the potential was there for a high standard of colour printing.

From the first, colour printing expertise had been already in existence in the printing arm of the firm, G. Tombs and Company having carried out some chromolithography for previous Christchurch publications, including one of the plates for Butler's *Catalogue of the Butterflies of New Zealand*, which had been published in 1880. About this time, Tombs had also been producing maps printed in colour. It is interesting that when John Taylor, the lithographic transferer and printer who was pivotal in the introduction of half-tone into New Zealand had first arrived from Melbourne, he had at first headed Whitcombe and Tombs Lithographic Department,⁶³ and it is likely that there he had heightened interest in new processes and in colour printing as well.

George Tombs left the firm on his retirement in 1889. By then the firm was well established, and went on to become a dominant force in New Zealand bookselling, printing and publishing. The New Zealand-born Bertie Whitcombe (1875-1963) who had served his printing apprenticeship in his father's firm, later carried on the family business after being sent overseas to both Britain and Australia for further experience, before coming home to manage the Dunedin, Wellington and Melbourne branches of Whitcombe and Tombs, and then in 1911 succeeding to general manager.⁶⁴ The firm's large printeries, besides specialising in text-books, produced general books and commercial stationery as well as doing a trade in general jobbing printing, for which colour was frequently employed, for instance in maps and posters.

H.J. Weeks Limited - Christchurch

Established in 1886 by Horace Weeks (fl 1886-1907), this Christchurch firm started in Gloucester Street, and very quickly became a diverse business. It expanded from only three to about seventy workers within the space of a decade, by which time it was thought to be the best housed printing firm in the colony. It will be recalled that around the time that William Taylor had pioneered tri-colour half-tone zinc engraving in Christchurch, Alex. Wildey had printed from three-colour process blocks made by Ernest Moss at the Christchurch Photo-engraving Company founded by Moss in 1894.⁶⁵ This firm was later absorbed into Horace Weeks Limited which had very quickly become an extensive business which carried out the diverse range of work that by this time could be undertaken in a New Zealand city printery, and this included colour printing. Printers and publishers of volumes two to six of *The Cyclopaedia*, H.J. Weeks Ltd. was described in the 1906 Christchurch volume under the heading "Paper Merchants, Printers, Publishers, Engravers, Art Autographers, and Manufacturing Stationers". After the premises of this firm, the Crown

Printing Office, had been relocated to Manchester Street, the character of their extensive business was said to be

striking and unique, and its excellent manufactures in cardboard and leather-board boxes for all trades, tea-packets; cartoons for manufacturing chemists, cordial-makers, and confectioners are special lines sent to all parts of the colony, and for which Mr Weeks holds machinery with sole rights. The general lines of the work turned out are:-General printing, newspaper and book publishing, lithography, engraving, photo-engraving, book-binding, account-book making, cardboard, leather-board and box manufacturing; also, paper-bags, tea-packets, and stationery of all descriptions. The photo-engraving department is second to none in the Colony, while the artistic show-cards turned out have commanded orders from the four leading cities of New Zealand.⁶⁶

Many of the printed goods manufactured here gave scope for the addition of colour: it is not surprising to find that by 1906 the Photo-engraving Department had a studio that was at the time reported in *The Cyclopedia* to be "specially arranged for the three-colour photography." Electric light had been installed, to allow for process block making whenever required, and expansion in this department was continuing. In the machine room were six printing machines, of which some were proudly reported to be "of the very latest kind" and the job printing and lithographic branches on the first floor were described as being "thoroughly complete."⁶⁷ The Albion hand-press that was made for Weeks Ltd. by Payne and Sons Otley Ltd. in 1913, can be seen today at the 'Printers Shop' at Christchurch's Ferrymead Historic Park.

That Horace Weeks himself was a talented printer is signified by the first-class awards that he gained in both printing and engraving at the 1896 Canterbury Industrial Exhibition, and his early experience in Auckland, where he had worked with the far-sighted Henry Brett, had been propitious. By 1906, it was said that the firm of H.J. Weeks had "a reputation for fine art designing and printing, particularly in process, half-tone and three-colour work...the most beautiful Coronation cards issued in June 1902 came from this establishment."⁶⁸ Later in the twentieth century, in 1951, this firm acquired the Wanganui firm of A.D. Willis as a branch.⁶⁹

As in Auckland, the major Christchurch newspapers such as the *Lyttelton Times* and the *Press* were also jobbing printers, engaging in colour work in that area, for example, they produced some of the early chromolithographed maps, and later featured colour printing as a part of the weeklies that were associated with them. (See Section V.)

Dunedin Firms and Colour Printing

Because of the gold discoveries in the sixties, Otago had become the economic heartland of New Zealand and by 1880 Dunedin was the largest and wealthiest city in the country.⁷⁰ Here the printing industry had early gained important standing and diversity. Recourse to the *Reports and Awards of the Jurors* from the 1865 exhibition shows that Dunedin printers

were early to the fore in the printing machinery class. Mills, Dick & Co. had won an honorary certificate for showing Main's Patent Economic Printing Machine, a cylinder machine that was capable of 1600 to 1800 impressions per hour, while mention was made of lithographic presses exhibited by Fergusson & Mitchell, and the Survey Office. In addition, the attention of New Zealand printers was drawn to the presence of a small Waterlow's Autographic Press exhibited by A. Eccles, which was said to have been "very ingeniously contrived, and might often be serviceable in the office and elsewhere for throwing off circulars and similar work."⁷¹

At the time of the gold-rushes the sheer increase in population meant that work was coming in to Dunedin printers, and in particular, much ephemeral jobbing work of the kind mentioned was being produced, both from the established newspaper firms and others seeing an opportunity. In the years from 1859 to 1863 the Otago population had grown from 9,000 to 67,000 while by comparison, that of Auckland in 1863 stood at 36,000. As discussed, one effect for the printing industry had been the infusion of "new blood."⁷² During the eighteen sixties, many took advantage of the favourable business climate and set up in the printing business, particularly as lithographers. It was perceived that all that was needed to become a successful lithographer was "a few stones, the use of a hand transfer press and some artistic ability."⁷³

As attention was turning from the Victorian goldfields of Ballarat and Bendigo to those of New Zealand, particularly the central Otago fields, printers were among the immigrants from Australia, some of whom set up in business in Dunedin, as well as in other places. Notable among these was Joseph Gregory who had trained as a lithographer in London, and the "gifted engraver" John Mitchell, both of whom at first worked at Fergusson and Mitchell in Dunedin, a branch of the Melbourne firm that had been opened by the latter in 1862.⁷⁴ As a service industry, printing was flourishing and the exhibition reflected this. The demand for basic commercial stationery alone created much business for Dunedin printers, and in that category at the exhibition, an Honorary Certificate had gone to Fergusson & Mitchell for the excellence of their book-binding and machine ruling. A.R. Livingston and H. Wise also were other Dunedin firms given a special mention for exhibits in this class. Maps from the Otago region were very much in evidence, and many of the Honorary Certificates awarded in the class: 'Educational Works and Appliances' were for locally produced maps. Of the twenty map awards, discounting the three that went to Britain and the two that went to Australia, six were awarded to Dunedin men and a further three went to other Otago printers.

Gold fever had created a new need for maps in particular, and during the decade from 1862 to 1872 over twenty lithographers set up in Dunedin to help supply them. That some lacked sufficient lithographic expertise became evident, as the high mortality among these firms, many of which only lasted for a few years, was attributed to this reality.⁷⁵ However, the basis for later colour printing was there, and among the firms that in the future produced colour work were Mills, Dick & Company; Fergusson & Mitchell (who were the foremost general printers, eventually bought out by Whitcombe and Tombs Ltd. in 1914); and J.L. Gregory. The last had previously worked for Fergusson & Mitchell in Melbourne and went into business as a master lithographer in 1866⁷⁶ following his arrival in Dunedin three years earlier.

In 1882 J.L. Gregory was amalgamated with Coulls and Culling to become Coulls Culling & Company. Later, in 1923 this was the firm that merged with J. Wilkie & Co. Ltd. to form Coulls, Somerville & Wilkie Ltd.,⁷⁷ the Dunedin firm that became well-known for its fine colour printing, and which by 1948 had a staff of over five hundred. As will be seen, an inherent flair for the art side of printing was already present: it was a thread that had come through both firms. Originally, the Coull brothers had arrived in Otago from London in 1871, making "wise management a hall-mark of the firm,"⁷⁸ a letterpress printing business which they had established in 1872, and this was undoubtedly a factor of importance to the success of the business. Such mergers were often necessary to provide the capital base for viable commercial advancement that underpinned the ongoing vitality of the printing industry.

The artistic Thomas George was another British-trained immigrant who had worked at the London lithographic firm of Ben George & Co. He assumed responsibility for that side of the work at the Dunedin firm he set up in 1864, Thomas George & Co., while J.L. Gregory, also originally from London, where he had trained, had joined the staff in 1865 as his pressman. An obituary for Thomas George was published in *Typo* in 1889.⁷⁹ Percy George followed in his father Thomas' footsteps as a lithographer, starting at the age of nine as assistant to J.L. Gregory. Later he was apprenticed at Mills Dick and Co. and then employed for around fifty years of the seventy he had spent working in the business in Dunedin as foreman at Wilkie and Co.'s Lithographic Department. Over this time Percy George witnessed the significant developments that transformed this side of printing:

He saw lithography develop from the old manually operated units to power presses; from stone to zinc plates, from flat-bed to rotary offset; and from hand transferring to photo-lithographic methods...his interest in the rapidly changing trade was maintained to the end. Many are the makeshifts of the printer, and as foreman Mr. George was a man of resource. At the turn of the century, Wilkie's lithographed the *Otago Witness* Christmas number. On one occasion, a picture of Mitre Peak reproduced in twelve colours required a grained surface to

imitate the matt of the canvas. "Percy" achieved an excellent result by adapting a piece of wire gauze, a blanket and a transfer press.⁸⁰

Many of the early New Zealand lithographers learnt the basics of their trade on the job from their overseas trained seniors, as Percy had done, although, as mentioned, from 1873 it began to be possible to study art subjects such as design from the Dunedin School of Art. The many Athenaeums, Mechanics' Institutes and Public Libraries successfully operating throughout Otago due to the liberal aid of the Provincial Government also meant that knowledge from books and periodicals, including the trade periodicals was readily accessible.⁸¹

Some trade journals were published locally, for example, the *New Zealand Press News and Typographical Circular* which began in March 1876, and later the *Colonial Printers' Register* which became *Griffin's Colonial Printers' Register* that was produced in Dunedin from October 1879. These would have been readily available sources of information for Otago printers. Like the later *Typo*, these earlier journals carried printing news from many parts of the globe in regular columns such as 'Overseas Exchanges'. Articles and hints for the colour printer were included. For example, the article 'Harmony of Colour' appeared in the July 1880 issue of the *Colonial Printers' Register* giving advice as to what were considered to be successful colour combinations:

The employment of coloured and tinted inks is now so general that some reliable information, for the guidance of those who are not familiar with the management of colours in printing, will doubtless be acceptable.

TWO COLOURS

Scarlet red and deep green, light blue and deep red, orange and violet, yellow and blue, black and salmon, black and light green, dark and light blue, carmine and emerald.

THREE COLOURS

Red, yellow and blue; orange, black and light blue; light salmon, dark green and scarlet; brown, light orange and purple; dark brown, orange yellow, and blue; crimson lake, greenish yellow and black.

FOUR COLOURS

Black, green, dark red, and sienna; scarlet, dark green, lavender and black; ultramarine or cobalt blue, vermilion, bronze, green, and lilac; sienna, blue, red and black.⁸²

The article also traversed the question of mixtures and tints, and gave practical advice concerning application.

In mixing tints to print with, the muller should be used to rub in the colours thoroughly, otherwise the work is liable to be streaky. It is advisable to mix no more of a tint than is needed for the work in hand. Most coloured inks work best if applied to the rollers a little at a time, until the depth of colour desired is reached, as coloured inks distribute slower than black, and are more liable to thicken upon and clog the type when too much is taken at once.⁸³

In the same year, in the November issue of the journal, now *Griffin's Colonial Printers' Register*, the following was proffered in the 'Miscellaneous Hints' column:

The best inking surfaces for colour work are porcelain, litho stone, marble or slate. Metals are injurious to coloured inks—even polished iron surfaces give dullness to bright colours.⁸⁴

At around this time, in the eighties, Coulls and Culling began to undertake lithographic colour printing after J.L. Gregory had joined the firm. The plant from both firms had been amalgamated, bringing together in a new building such machines as the "Demy Folio Furnival which Mr. Gregory had used as a litho machine since the early seventies, and ...an old Double Demy first erected in Coulls and Culling shortly after."⁸⁵ One colour job had involved the production of an extensively illustrated catalogue of furniture and hardware for Guthrie and Larnach that had called for two-colour lithography on toned paper, but the job unfortunately had to remain unfinished due to the destruction by fire of the clients' premises. For this job a Mr Best had been the artist responsible for the illustrative drawings, and the lithography was being executed on a Double Medium Greave machine.⁸⁶

Coulls and Culling had been among the New Zealand firms that pioneered the application of steam power to jobbing printing to increase speed. One jobbing compositor apprenticed at this firm at around that time had been John McIndoe, who had arrived in New Zealand aged one year. Later he had also worked at Fergusson Mitchell Ltd. before founding his own business in 1893. By 1890, this Dunedin-trained printer was among those turning out quality colour work in a city that was described in that year by R.C. Harding as pre-eminently a city of printing and publishing. An item printed in tints from Fergusson Mitchell, who had been the first Otago job printers and who led that branch of the trade for many years there, caught Harding's eye at the time, and prompted him to comment in an 1890s issue of *Typo*:

The Fergusson Mitchell Ltd. booklet advertising types of work undertaken, contains some of the best tint printing and typographical designing that we have yet seen done in New Zealand. It is the work of Mr. J. McIndoe.⁸⁷

By the decade of the nineties many printing firms had weathered hard times brought on by the general depression of the eighties that had coincided with the end of the gold boom era. This was also the decade in which the technology for the printing and reproduction of images was changing radically, and gradually the older crafts such as wood engraving, that had never enjoyed more than a fragile existence in the New Zealand colonial environment, were being ousted. Voicing his misgivings at the arrival of the new photomechanical order, R.C. Harding wrote in support of some of the local crafts-people, including the Dunedin wood engravers Miss Maxwell⁸⁸ and Messrs. Kemnitz and Nicholson, praising their work.

In this city, it had been the professional photographer W.R. Frost who had been the first photo-engraver. He had been in business from 1894 in this capacity, although it appears that he was experimenting in process work at least from the beginning of the nineties.⁸⁹ The

development of process colour printing in Dunedin has been credited to Henry Gamble, who appeared, as R.A. McKay pointed out, "in the early days of process work in each of the four [main] centres."⁹⁰ McKay also alluded to Gamble's interest in three-colour lithography, while *Invicta News* stated that Henry Gamble was the first to make three-colour blocks in New Zealand.⁹¹ However, as mentioned, in the light of the fact that A.A. Smith has recorded that this step had been taken in Christchurch by 1898, Gamble was probably first in Dunedin, since his period of business in Dunedin was between 1901-1907. Henry Gamble was the harbinger of that important change to colour printing methods in that region, a change that would eventually render the chromolithographic art obsolete, but not for many years.

J. Wilkie and Co. Ltd. - Dunedin

Indeed, one of the chromolithographers working in Dunedin in the early years of the twentieth century was an Australian, George Watts, who had been born in Bendigo in 1869, and who had been an artist trainee at the firm of Troedel and Cooper in Melbourne, well-known for their quality colour printing. In 1881, against competition from around the globe, C. Troedel was awarded a first Order of Merit at the Melbourne Exhibition, one of the few Australasian printers to have been successful in the category of colour printing.⁹² After coming to Dunedin, George Watts had worked in the eighteen nineties at both Mills, Dick and Co.'s firm in the Octagon, and then from 1899 at J. Wilkie and Co. under the talented Robert Hawcridge who in 1909 became the principal of the Dunedin School of Art. When George Watts took over as manager, a position he held until his death in 1942, chromolithographic colour printing was still in full swing in this Dunedin firm. Looking back from the perspective of 1947, it was reported in *Invicta News* that:

In 1909 the method of lithography was almost entirely that of the chromo artist who drew the various colours, up to a dozen or even more, on separate stones. The work was of a very high standard, but would not be competitive commercially with modern methods. In 1914 the first change, that of direct or flat-bed lithography to rotary offset was made. The succeeding years saw a gradual change from chromo-lithography to photo-lithography...⁹³

The firm of J. Wilkie and Co. Ltd. had been earning a reputation for high-class lithographic work from around the turn of the century, high standards being set by the staff lithographer Robert Hawcridge. Dating from the early seventies, when James Wilkie had established it as a bookselling and stationery business, the firm had in 1885 gone over to the manufacture of stationery instead of bookselling, and by the early nineties, had moved to new premises. Up-to-date machinery was installed to allow the expansion into all branches of printing, and this included lithographic machinery that was installed in 1887. Later, only a few months after Wilson and Horton took the step of introducing offset lithography in Auckland, the

pioneering change to offset methods for Dunedin occurred at Wilkie and Co. following a visit by Thomas Somerville to England in 1912 "to study developments in photolithography."⁹⁴ The connection with the Somerville family had begun when William Somerville had supplied financial assistance to the firm after the death of James Wilkie in the early eighteen nineties.

The first lithographic artist at Wilkie's had been Mr Lane, an Englishman who had died after a short time with the firm. While extensive chromolithographic production had been beyond the reach of many firms, especially in the earlier depressed years, the use of chromolithography to add the colour was feasible for the enhancement of some of the smaller items produced from jobbing printing and was being increasingly employed in this capacity. It had been in 1889 that James Wilkie laid the foundation within his firm for the later Coulls Somerville and Wilkie's colour printing when he secured the services of the master artist Robert Hawcridge (1866-1920), thus beginning a period of expansion at this firm. Wilkie's reputation had been immediately enhanced by the outstanding work produced by this man who was not only an artist but also a scholar and musician, and was a perfectionist in his trade. Robert Hawcridge had originally been trained as a commercial artist in England and had worked in Leeds at Alfred Cooke & Sons as principal show-card designer before emigrating. It has been asserted that in the course of his career Robert Hawcridge had become "the foremost lithographic artist in his day...one of the outstanding figures of his chosen profession in the history of New Zealand printing."⁹⁵ Percy George had joined Wilkie's just two months after Hawcridge, and was therefore a co-worker in the production of

a very beautiful booklet depicting the West Coast sounds, the original sketches of which were made during a tour of Fiordland enjoyed by Mr. James Wilkie and the artist [Robert Hawcridge].⁹⁶

However, quality colour printing was expensive, and this fact, coupled with depressed business times and a manager, Mr Barmby, whose reportedly reckless undercutting of potential competitors with quotations based only upon guesswork, depleted the financial reserves of the firm. In addition it was said that Robert Hawcridge's laudable high standards, derived from his English training "where the runs required warranted the extra colours he was so prone to demand"⁹⁷ were incompatible with New Zealand marketplace conditions.

A considerable period was required before he could adapt himself to the marketing conditions of a country with a population of little more than half a million. The aim of the true artist is perfection. When requirements are limited the cost of printing perfection is frequently higher than the buyer is willing to pay. The results achieved added much to the standing and goodwill of the business and these were capitalized in a later era; but the increased costs of establishment imposed a burden too heavy for the business to meet.⁹⁸

It was said that it was certain that his department was constantly in the red – it is probable that it was the pursuit of high quality colour printing that contributed to the firm's financial crisis of the early nineties.

Mills, Dick & Co. - Dunedin

Founded in 1862, Mills Dick and Company principally printed newspapers and periodicals, but added a lithographic section in 1872 when it amalgamated with the lithographic printer Samuel Lister to become Mills Dick Lister and Co., although in 1875 Samuel Lister again became a separate entity. A glimpse of the Lithographic Department in which colour work was undertaken to produce items such as posters and labels, as would be experienced by a visitor to the firm at the close of the nineteenth century has been reported in the 'History of Otago Printing 1849-1937.' The account was given by Mr. E. Kerr, an employee from 1892:

The plant for all departments was the equal of any printing house in the city. In the machine room were two double royals, a bag-printing machine, folio-demy, two platens, and last but not least, two big litho. machines for printing by the old litho. stones. These stones, which were stored round the machine room like a big library, turned out very fine colour work. Fruit labels, for the Auckland firm of Thomson & Hills, would have done credit to a modern press. They were varnished on a travelling endless conveyance, which traversed the full length of the binding room, with gas burners underneath for drying.⁹⁹

Auckland Firms

In Auckland, besides the newspaper firms, by 1902, *The Cyclopaedia* listed two specialist manufacturing stationers and five printing firms, including the firm of P. Spencer & Co., established in 1884, who were also listed (solely) as process engravers, and who manufactured process blocks and stereotypes.¹⁰⁰ But in this northern city, it was the larger newspaper firms that were to the fore in the area of colour printing and that were to see a way of providing New Zealand with colour for the mass market. The Auckland firms Wilson & Horton and Henry Brett were both newspaper businesses that were active in the field of colour printing in the period under study, and are representative of other New Zealand newspaper firms who saw a place for colour in the marketplace of print, especially in association with the weeklies. (See chapter 10.)

Wilson and Horton

In 1897, the year that *Typo* ceased, and around the time that process work was being introduced in printeries throughout New Zealand, an article appeared in the *Auckland Weekly News*, the weekly journal that had been printed and published by Wilson and Horton since 1877, that detailed aspects of their own business, including aspects of their colour printing. Such an account gives valuable evidence concerning New Zealand commercial colour printing at that time, since facts given in such an account have emanated from the firm itself. In a small country such as New Zealand, general practice at such a firm is likely to be typical of at least general practice in other centres with similar large firms, especially

since by this time a greater feeling of nationality prevailed. By then it was in the larger firms that the employment of a greater spectrum of what were still relatively expensive colour printing processes was more likely to have been a feasible business option, hence such an account is more likely to give an overview of the colour processes that were by then in use in the larger printing businesses of New Zealand. At Wilson and Horton, when Henry Horton took over control in 1903 on the death of Alfred Horton (?1842/43-1903), the ongoing emphasis on graphic production at this firm was partly a result of his special interest in this side of printing, but was also because by then the plant and expertise was well established: this Auckland firm had pioneered the use of colour printing in both its *New Zealand Herald* and in the *Weekly News* in the eighties. (See genre study: chapter 10.)

Nature of Business

Although Wilson and Horton was essentially a newspaper business, its *Herald* being by 1897 the largest morning paper in the colony, the firm had always carried on an additional trade in jobbing printing, as was common in most colonial newspaper houses.

Attached to the *New Zealand Herald* and *Daily Southern Cross* at the time of their amalgamation [in 1876¹⁰¹] were small jobbing printing works, and the combination of these two plants formed the foundation upon which has been built up one of the largest general and lithographic printing works and manufacturing stationery businesses to be found in the colonies, giving employment in all its branches to upwards of two hundred hands.¹⁰²

It was in both sides of the business that scope for colour printing had been found, as colour jobbing printing was undertaken in addition to the supplements that were prepared in colour for special numbers of the *Weekly News*. Wilson and Horton were both letterpress and lithographic printers, thus affording the client both avenues as possibilities for colour printing orders. The branches of business included by 1897 at Wilson and Horton's printery were reported in the *Weekly News* as including typesetting, engraving, drawing, etching, box-making, paper-ruling, book-binding, embossing, lithography, electrotyping, stereotyping, varnishing, printing, and wood-cutting, and it was claimed that "for the number and size of its departments, and the variety of work reproduced in them, the *Herald* has not a rival in the colony."¹⁰³

Premises

The old New Zealand Herald office of 1863 had been in Wyndham street, but the increasing success of the business called for extra floorspace, and in the late nineties a new building was erected, to expand the frontage on Wyndham street from 50 to 104 feet, and to give a new frontage on Queen Street of 40 feet. With an imposing exterior, the premises contained "spacious and lofty" public areas on the ground floor and a first floor that included, in addition to offices, a store "for all kinds of paper." The building was served by a lift which

had been imported from the Sydney manufacturer Waygood and Co., and this was considered to be one of the most modern and unique features of the building. On the second floor at the back was the jobbing composing-room, of which it was reported that:

This jobbing composing-room is the most complete of its kind in the colony, and special attention has been paid to light and ventilation. This room is connected with a goods lift, capable of raising a ton and a half. The motive power is provided by pulleys and belts connected with the large steam-engine which drives the printing machinery of the establishment. This lift travels from the basement to the top floor.¹⁰⁴

A photographic artists' studio was on the third floor at the back, while the top floor was occupied by the newspaper composing rooms which were lighted by large windows, and which had vertical "factory lights" in the roof, which could be opened to give "a perfect current of air during the most oppressive weather." On this floor was also the stereo room and plant. Four hundred incandescent lamps provided the whole of the premises with electric light, and importantly, two arc lamps of 3000 candle-power had been installed for photo-process work. It was stated that "the light from these is so intense that a photograph can be taken in less time than by daylight."¹⁰⁵ Besides the telephone, for internal communications a telegraphic system had been installed, for example to enable the despatch of proofs from one department to another.

Libraries

It is indicative that on the third floor, adjacent to the proprietors' suite were two libraries, "one for works of reference, and the other fitted with racks for bound newspaper files of the Auckland daily and weekly journals"¹⁰⁶ that they published. The holding of reference information on the premises bespeaks a firm that kept in touch with the trade literature, and consulted it.

Staff: Departments

Of the around two hundred staff, twenty worked in the jobbing room, where for example, the type required for printing the tiny card, a tasty circular, or the huge poster that covers the hoardings of the city [was] set up and made up into formes ready for the machine.¹⁰⁷

The staff of letterpress machinists on the floor below received the formes from the jobbing compositors by lift, and produced the print products according to the order. The Lithographic Department was staffed with draughtsmen who were:

continually occupied in designing or drawing, either direct upon the stone or on "transfer" paper, from which the work is transferred to the stone.¹⁰⁸

Artisans working in the traditional areas of copper-plate engraving and wood-engraving were also in the employ of Wilson and Horton preparing plates and blocks, as well as the photo-process workers who staffed the Process Department.

Plant and Equipment

Wilson and Horton boasted a fine plant, and it was stated that the latest improvements in machinery were constantly being added. In 1897 an order placed in England for three of the "most improved" machines was just being completed. For letterpress jobbing work the machine room at that time contained "large cylinder machines, for book and pamphlet work, poster, etc., together with a number of platen machines suitable for smaller work." It was said that, for the Jobbing Department,

the varied and numerous founts of type are from the best English, American and German foundries, and as new styles and faces, the product of the skill of the competitive designers of these lands, are brought out, so many fresh types are added to the plant which is thus ever increasing in bulk and variety.¹⁰⁹

By this time, stereotyping and electrotyping was carried out at Wilson and Hortons, where in fact the first stereotyping in the colony had been accomplished.¹¹⁰ Mention is made that for these processes, some of the machinery had been designed by the firm and made in the colony:

The powerful press for making the wax moulds, planing machine for surfacing the backs of the plates, the dynamo and a drilling and routing machine for boring holes in plates and cutting out the space or whites required, were all made in the colony mostly from our own designs.¹¹¹

The 45-horse vertical, and the 24-horse auxiliary steam engines that drove the machinery and the boilers were also locally made to the specifications of the firm. Two gas engines were kept in reserve.

The description of the contents of the paper store, which was said to hold immense stocks of papers of every description, gives a view of the categories of this vital commodity, the substrate for all its printing, that were considered in 1897 to be necessary for such a business. Among the types of paper mentioned was a category imported especially for chromolithography:

Here is to be seen, all neatly arranged on shelves, ponderous reams, containing hand-made papers of great weight for account books of every conceivable description, down to some of the very thinnest copying papers, tissues for letter books, and manifold papers. Printing papers of every size from 30 x 40 downwards, and of varied qualities are to be found. The stocks of cardboard are also immense, and include everything from that of which cigarette boxes are made to the thick enamelled-faced card used for calendars and chromolithographs. Wedding cards, ball programmes, and a great variety of fancy cards are all kept in stock. A large business is also done in envelopes of various sizes, shapes and qualities, from the strongest cloth lines downwards. Each steamship from London brings goods for the *Herald* office, stocks being constantly replenished, while at the same time novelties in cards and fancy papers are also added. The paper on which the beautiful glossed label productions of the *Herald* are printed is imported from New York. To make room for the large shipments of paper it was found necessary some time ago to occupy premises in Mills Lane, where some of the *Herald's* stock of paper is opened out preparatory to its being put on shelves in the stationery department, from whence it is taken as required for printing.¹¹²

Colour Processes – Chromolithography and Process Engraving

For jobs requiring colour printing at Wilson and Horton, chromolithography was one of the chief processes employed. It was pointed out that a visitor to the Lithographic Department, on seeing the chromolithographic process in action, was "always astonished at the amount

of work necessary in the initial stages of production of, say, a label printed in four or five colours, for the adornment of the jam, fruit or meat tins of our day." It was said that:

for each of these colours a separate stone is used and the artist is required to carefully fill in with a brush upon one stone all the lines and parts designed for printing in yellow, upon another all the portions for red, and so on till the whole set is complete. For chromo-lithographs ten to fourteen colours are used, and it will be seen that no small amount of labour must be expended to make up a series of stones for this class of work.¹¹³

That the copperplate and wood engraving processes in use were traditional methods from the Old World that had diffused to the Antipodes in the hands of the artisans is evident from the detail of the account:

The copperplate engraver, with a set of fine tools skilfully engraves in most delicate lines upon his polished copper plates the wording in designs for cards, invoices and letterheadings, cheques, commercial and ornamental work generally, and for the shading and line work, which is too fine in its detail for the hand, he uses what is known as an engravers' ruling machine with adjustments so accurate that several hundred lines to the inch may be engraved on the plates. For the production of plates in the style which the Americans have brought into such general use this machine is an essential appliance. The engravers' services are also in demand for sinking steel dies for embossing in colours on note paper and envelopes, or for seals for use of companies and corporations; while brass name plates for doors and stencil plates likewise engage his attention.

Engraving on wood is quite a distinct department; woodcuts being printed from letterpress machines in the same manner as type, the engraving is in relief—the lines and dots which show in the impression being left the original height of the block and the whites cut out; in copper the method is just the reverse, only the lines which appear in the print are engraved, while the remainder of the plate is untouched. For a woodcut the drawing is made upon the smooth surface of the close-grained boxwood, and the engraver very carefully cuts away all the portions untouched by the artist's brush and pencil, and on the completion of his work we have a block ready for the printer.¹¹⁴

Both these methods of engraving plates were capable of being foundation processes for colour printing, especially if transferred to lithographic stone. The account of the methods in use in the lithographic press and machine room is also informative concerning this aspect of end-of-century New Zealand colour printing, especially in view of the fact that Wilson and Horton was considered to be to the fore in the field of graphics printing in this country, as well as being noted for keeping up-to-date in a general way. The physical detail given in this article provides evidence of the operational side, but in addition gives insight into what it was like to be there:

We now turn to the lithographic pressroom where a number of operatives are engaged in transferring to the stone from the artists' drawing or the engravers' plate, and preparing the stones for the machinist. The stones used are exceedingly fine in grain, and possess a surface made perfectly smooth by grinding and polishing, and upon these the design for printing is transferred. Large hand-presses are used for this purpose, and alongside these are also presses for "pulling" the transfers from the plates and for printing visiting and business cards.

The presses for pulling transfers and printing from engraved plates were probably rolling presses. Such a small rolling press, used from around 1880 onwards in New Zealand, survives in the 'Printers Shop' at the Ferrymead Historic Park in Christchurch. The need for a goods lift able to carry a ton and a half connected to the Wilson and Horton job composing room becomes clear: it was used to carry the heavy lithographic stones between

the composing and the machine rooms, the latter being the place where the chromolithographic processes were in full swing:

The huge stones, on leaving the transferrer's hands, are sent by a lift to the machine room, and the process of printing commenced. Supposing the work to be that of a four-colour label, the whole number of sheets, (and there are from 15 to 30 labels upon one sheet), are printed first in yellow, then another stone put into the machine, and the second colour printed on, and so on, till each sheet of paper has passed through the machine four times, making the printing of the label complete. It will be seen how much care is needed in making up the stones and laying the sheets into the machine in order that the impression of each colour falls exactly in its proper place, and not overlapping any of the other colours. There are several machines of different sizes in use for both black and colour work, and many thousand sheets are printed in the course of a week's work, affording employment to a number of men and boys.

A special feature of the *Herald* works is the output of varnished labels, a branch of the lithographic trade which has developed largely since the introduction of this class of work to the colony some years ago, and, being first in the field, no effort has been spared to keep in the van, consequently the *Herald* varnished labels have an established reputation for superiority amongst the canners of New Zealand. For this reason a visit to the varnishing room is interesting, as here the visitor will see thousands of sheets of labels of different sorts either waiting to be put through the varnishing machine, or else hanging for drying after receiving the coat of varnish, which gives such brilliancy to the colours and adds to the general attractiveness of the label. From hence the sheets are despatched to the warehouse, where they are cut and packed for delivery or shipment.¹¹⁵

A description of the Photo-process and Etching Department is worth reporting in detail as evidence of how the newer photomechanical processes, by now in use at Wilson and Horton, were changing methods of Antipodean print production, as they were also in the northern hemisphere. The account gives details of exactly how the zinc process blocks were made, after expertise had been honed by sending employees to train overseas in both Britain and America, from whence equipment had also come:

Our description of the works would not be complete without reference to the photo-engraving department, for which up-to-date plant and appliances have been selected in England and the United States. In these days, when such immense strides have been made in the art of illustration, it is necessary to keep abreast of the times, and to do this a representative was sent to England to spend some months in one of the first houses in Great Britain engaged in the photo-engraving and etching business, and also to gain experience in New York of the most approved American methods. We suppose that all our readers are familiar with the appearance of half-tone engravings which abound in the illustrated papers and magazines; everyone is bound to exclaim "How very true the likeness is," should the subject be a portrait, and it is not surprising that the effect is good, since by a mechanical process the block from which the print is made is produced direct from a photo. Instead of the laborious method of wood engraving, which first necessitates the drawing of the subject on wood, and second, the engraving, both, of course, being entirely hand-work, the process now employed is capable of giving a block in infinitely less time and consequently at a less cost, whilst the effect is greatly superior to the average wood cut.

In our photographic studio, work is done entirely independent of the sun, two large electric arc lamps, each of 3000 candle-power, being used for the necessary light. By this means no time is lost, as work can be photographed either night or day. The specially-built camera used is of the very latest pattern, and is capable of taking a negative 20 x 17. The photo is placed on the copying board and a negative made by the wet plate process in the ordinary manner, except that immediately in front of the sensitized plate in the camera is placed a glass screen with very fine cross-ruled lines upon it for the purpose of breaking up the picture into different sized dots to give in the print the various tones. These screens are made with lines of from 90 to the inch for the more open work, to 130 lines to the inch for the very fine grain blocks. A few seconds exposure in the strong rays of the arc lamps is all that is required, then the plate is developed, fixed and intensified; afterwards being placed in a printing frame and a print taken on a highly polished, sensitized zinc plate, for which the electric light is again used. The zinc in turn is developed, prepared with various acid resisting powders, and immersed in a diluted acid bath to receive the etching. In a short time a sufficient depth is obtained, and after the plate is fastened on a wood mount to exactly the same height as type, we have a block ready for the press. Blocks can also be made from drawings or engravings executed in line, and for these the use of the screen is unnecessary.¹¹⁶

There was as yet no mention of colour printing from this relief mode. It can be recalled from chapter 6 that the year after this account was published, the first colour half-tones to be produced in New Zealand were printed in 1898 in Christchurch. Wilson and Horton soon took this extra step, as can be seen, for instance, in the appearance of the three-colour half-tone produced as a loose give-away print in the a special number *Auckland Weekly News* in 1902. (See plate 44, chapter 10, opp. page 440.)

General Products

It was reported that in the Jobbing Department of the Herald Printing Works where there was a staff of eighty hands at the time, “every conceivable description of printing is here executed – from a volume of 300 or 400 pages to a visiting card, from an art circular in colours to an ordinary bill-head.”¹¹⁷ In addition to their letterpress colour work, the products from the Lithographic Department included not only the labels (as described above), but also “showcards, coloured wrappers, posters...in almost endless variety.”¹¹⁸ Wilson and Horton regularly advertised their products, for example, in the *Weekly News*, where their own advertisement was often strategically inserted at the bottom of the advertisement pages, or on page 16, where the ‘Contents’ column was placed. One advertisement that appeared on June 25th 1898 mentioned that any prospective client wanting printing services should call at the Queen Street premises or, if a visit from Wilson and Horton’s traveller was required, the client should ring phone number 178. The advertisement listed some of the printing services, including colour printing services available from the Herald Works, Queen Street:

Printing

Of every conceivable description – from an Art Circular in colours to a modest notice: from a poster to a handbill. Promptness in delivery a feature.

Lithography

In all branches of this varied business- from a beautiful chromo-lithograph to a notehead. The Herald works are famed for high-class work in this Department. Glossed labels a special feature.

Engraving

In wood or copper, by skilled workmen, from a visiting card to a Brass Door or Name Plate.

Die Stamping and Embossing

In gold and colours, neatly and promptly executed...¹¹⁹

On January 8th 1898 another such advertisement listed items that could be produced by the firm, stressing the attention to a prompt despatch by mail, a point that may have given competitive advantage:

Illuminated testimonials for Presentations executed by special artists from £2-10s, at the *Weekly News* Works, Auckland....Soiree tickets, posters, and programmes printed and despatched by return mail...Industrial exhibition posting bills, printed with effective illustrations. Tickets, catalogues...despatch can always be depended upon by return mail...Company printing, binding and engraving. Executed in the best manner, for metal or rubber seals, scrip dividend warrants, call books, notices and receipts, ledgers, cash and day books, journals, share registers, note and letter paper, ordinary and official envelopes, return and account forms, in

ordinary or copyable printing ink, and miscellaneous printing, binding, ruling and machinery work of every description....¹²⁰

As well, colour prints and supplements for inclusion in the special supplements for the weeklies, particularly the Christmas supplements, were produced at the Wilson and Horton printing works. In addition to revenue from the newspapers themselves, profits from everyday jobbing work underpinned such enterprise. In colour printing for the genre of the weeklies, Wilson and Horton had led the way. It is indicative of this that a colour illustration from this firm was published in the British *Penrose Annual* for 1905/06, perhaps the first produced in New Zealand to have appeared in its pages. Acknowledged as having been reproduced using three-colour process blocks by the *Auckland Weekly News*, the image was 'A Maori Maiden'.¹²¹ (See plate 8, chapter 6.) Front cover illustration was usually also colour printed, for example, the 1908 cover for the Christmas number, which shows a Maori woman, by then competently printed as a half-tone image, using the four colour process. (Plate 15.)

Sir Henry Brett and the Star Printing Works

Henry Brett (1843-1927), who with G. M. Reed co-founded the *Auckland Star* in 1870,¹²² was proprietor of the other large Auckland printing firm that was sometimes using chromolithography to add colour from the press to many categories of print products. After the *Star* moved premises from Wyndham to new buildings in Shortland Street in 1879¹²³, like Wilson and Horton, Henry Brett's firm was a combined newspaper and jobbing printing works that took in both letterpress and lithographic job-work.

Henry Brett was also one of the pioneers in the field of the New Zealand illustrated journal. He had published *Family Friend*, an early ladies' journal that was later absorbed into one of the first illustrated journals in the country, *The New Zealand Graphic* which ran from 1891 to 1913, and which made heavy use of illustrative printing processes in its production. (See chapter 10.) At first woodcut illustrations and then zinc line etchings were used, the latter for a period in preference to screened blocks. R.A. McKay has included an account of the place of Henry Brett in New Zealand printing in his history¹²⁴, portraying him as a forward-looking businessman who gradually built up machinery and equipment to keep the firm up-to-date with the printing capabilities of the times, reporting that one of the presses initially in use at the Wyndham Street premises, a double demy Belle-Sauvage, gave a speed

Plate 15: 'Auckland Weekly News Christmas Number, 1908': Front cover

Printed and published by Wilson and Horton, Auckland.

By permission of the Alexander Turnbull Library, Wellington, N.Z., New Zealand and Pacific Collection.

Ref. No.: N-P 590-Cover

Auckland

Weekly News

1908

Christmas Number.

PRICE ONE SHILLING

Printed by

Published by the Proprietor

advantage, and that this was superseded first by a two-feeder and a four-feeder Wharfedale, and then a flat-bed double royal printing plant. In 1887 Henry Brett installed "one of the first rotary stereo-plate printing presses in New Zealand, a Duncan "Victory",¹²⁵ and was also the first in New Zealand to introduce the linotype machine.¹²⁶ In the second (1902) volume of *The Cyclopedia of New Zealand* it was asserted that

by continual addition to the plant and machinery of the office, the establishment has been raised from small beginnings to one of the best appointed general steam printing offices in the colony. Mr. Brett was the first to introduce into the Colony a plant for photo-engraving...¹²⁷

The Jobbing Department in the Star printing works produced not only commercial stationery, and items such as posters and labels, but also several periodicals and books, some of which included chromolithographic colour illustration. (See chapter 9.) The early German chromolithographer John Diedrich Schmidt's lithography plant had been added to the business in 1879 when Henry Brett and Schmidt had gone into partnership, but although the partnership was brief, the lithographic business was not, and became important to the colour printed supplements provided as a part of the *Graphic* Christmas Numbers.

Bretts and Chromolithography

When colour was introduced, before three-colour processes had become possible, the Christmas supplements for the *Graphic* were printed by the labour intensive chromolithographic process using as many as twelve different stones to print the colour plates: at the time only one-colour letterpress work was done at Bretts. McKay surmised that although the greater number of these Christmas supplements were posted overseas, some of the colour productions may still be seen hanging as prints on Auckland walls. When Schmidt's business had been absorbed into Henry Brett's, his son William Schmidt became responsible for originating at least some of the art work for chromolithographic production at Bretts as well as the chromolithography itself. Many of the chromolithographic prints produced at Bretts in the early twentieth century bore his name as the artist, some having been produced for distribution as *Graphic* supplements. "Drawn on stone by W. Schmidt" appeared on some of the prints. (See chapter 11.) The *Star* apparently welcomed visitors who wished to observe the printing processes in action. Such visitors to the Shortland Street premises were therefore able to watch the chromolithographers at work, seeing at first hand

huge litho-stones, every inch of them drawn by hands of artists, pass under damping rollers, then under rollers charged with ink, to meet a sheet of paper, gripped by a heavy cylinder which pressed the sheets to the stone's surface. This sheet was removed and replaced by another. If the job was a twelve-colour job, each sheet had to be printed twelve times, and if a hundred thousand pictures were required, it necessarily took months and months of constant work.¹²⁸

After process work had been introduced into New Zealand, more modern photographic methods were adopted by Henry Brett to print the *New Zealand Graphic*. (See chapter 10.) By 1900, the “Brett Printing & Publishing Co. Ltd. Auckland” was among the few Australasian entries appearing in the list of around 100 engravers addresses from around the globe published in the British *Penrose Annual*.

The Firms: Colour Printers of The Lower North Island

As well as in Auckland and in the South Island other prominent early colour printers were operating in the Lower North Island. South Island business had been boosted by the gold-rush economy, and in Christchurch, especially, by the comparatively greater wealth that came with the early Canterbury settlers. As already discussed, during the colonial period, interaction between Australia and New Zealand was much in evidence: many colonists had lived in both places. In the printing industry, there was considerable ongoing movement of personnel between the two countries, especially between New Zealand and the eastern seaboard of Australia: Melbourne, Sydney and Hobart in particular. This inter-migration provided one means of contact which facilitated the communication of ideas and knowledge, as well as the trading of expertise, information and equipment, and this was true particularly of colour printing, an area in which specialised training and expertise was particularly necessary.

However, the long depression in New Zealand had created the impetus for the migration of many tradesmen back to Australia, the nearest country in which they could seek work. Harding made many references to this situation in *Typo*, in which there are often columns referring to progress of industrial trade relations, with references made to the fact that, at least in the decade that *Typo* was appearing, New Zealand printers had little difficulty finding work in Australia—they were snapped up. But it had not been infrequently the case that a migrant from Australia made a difference to colour printing in New Zealand. For instance, some of the colour printers, for example, George Watts who had worked in Dunedin, and John Taylor who pioneered process printing in Christchurch both had crossed the Tasman.

Bock and Cousins (Wellington)

William Bock from Tasmania (1847-1932)

One colour printer who was in business in Wellington in the nineteenth century and who had been born, raised and had his early training in Tasmania rather than in the Old country, was William Rose Bock. That he was a printer of Australian birth had been due to a stroke of fate, as William Bock’s father, Thomas Bock, who trained in Birmingham and was in

business in London as an engraver and portrait painter, had been transported to Hobart for a misdemeanor. In that colony he appears to have been the first to introduce engraving, and became the first practising professional painter.¹²⁹ His engraving work included the preparation of plates for printing early bank-notes, almanacks, bill-heads and commercial cards. Thomas Bock was also a photographer, and, as mentioned, was credited with the production of the first Tasmanian daguerreotypes as well as some of the first lithographs to be made in the southern hemisphere. The latter were prepared as illustrations for a book on the lives of the bushrangers, a project that was undertaken by Bock in an attempt to create his own employment, an early instance of self-publishing. The impetus for this enterprise came from the fact that in the Tasmanian colony "there was very little call" at the time for the engraved work in which he specialised.¹³⁰

In spite of this situation, Thomas Bock had built up his business and diversified into portrait painting, the high standard of his work enhancing his reputation. Some of his best known work was of aboriginal portraits for G.A. Robinson, copies of which were commissioned. For example, in 1838, Thomas Bock had undertaken a portrait of Robinson in Sydney, working at the printing shop of Raphael Clint: Robinson had asked for ten lithographic copies to be made. Because expertise in this area was then lacking in the colony, "no one in Clint's workshop was able to pull the prints,"¹³¹ and it is believed that the portrait therefore had to be sent to England to be lithographed.

William had been born to Thomas Bock and Mary Cameron on 6th January, 1847.¹³² The artistic flair from his father was already in the young William's blood, and it was also under his father that it developed as he was taught drawing and engraving. After serving an apprenticeship with his half-brother Alfred, in Hobart, William Bock made his name in Hobart as a designer of crests and seals and illuminated addresses, but after an initial move to Melbourne where he was unable to find work, Bock finally sailed for New Zealand in 1868 and settled in Wellington, later marrying and bringing his Tasmanian wife to New Zealand also.¹³³ At first Bock had taken employment with the Wellington printer, Mr. Hughes, where he remained until he joined the firm of Lyon and Blair in 1871. During his time with Lyon and Blair, as general manager of the Lithographic and Printing Department William Bock was involved with the engraving and lithography for the production of maps, plans and other job-work, some of which were printed in colours.

William Bock left Lyon and Blair in 1879, and after a year again with Hughes, set up his own engraving and lithographic printing business in Lambton Quay, a venture which

depended on his professional engraving, die sinking and design skills, a move that would also soon afford him greater scope for colour printing. William Bock's skill with colour was still sought after, however, by his old firm Lyon and Blair for whom he continued to undertake specialist colour work. This sometimes still involved hand-work, an example being the commission he undertook for their 1887 publication of Archbishop Francis Redwood's album of photographs, a copy of which was presented by the Roman Catholics of Wellington to Pope Leo XIII on the occasion of his Golden Jubilee in that year. Entitled *Sketch of the Work of the Catholic Church for the Last Half-Century, in the Archdiocese of Wellington, New Zealand* it contained 3 leaves, and sixty-three pages of plates. The preliminary leaves have been described by John Muir as "an illuminated manuscript address in gold and coloured paints, on vellum, signed "Bock & Cousins" and "W. R. Bock del."¹³⁴

William Bock's new business grew quickly, bringing in more work than he could comfortably handle by himself, and precipitated his decision to go into partnership. The first partnership, with Henry Elliott, was short-lived, but his subsequent partnership with Alfred Cousins, who was also an engraver, lasted until 1889, the year of the publication of the firm's colour printing tour de force, the *Art Album of New Zealand Flora*. After that year, until 1894 Bock again became sole proprietor of the business which became W. G. Bock & Sons, a lasting institution that was only wound up in 1987.¹³⁵

Alfred Ernest Cousins (1852-1935)

Alfred Ernest Cousins had been born in Jersey on 24th October, 1852, and received his training as an apprentice engraver in London at the firm of Samuel Stevens. After emigrating to New Zealand in 1874, Cousins was at first employed in Wellington by R. Burrett for eighteen months, and then by Lyon and Blair for nearly seven years. He next transferred to the employ of Bock and Elliott, and after Elliott's retirement entered the partnership with William Bock. In 1889, on the dissolution of the partnership, Alfred Cousins went into business on his own account, continuing to execute the engraving for such items as crests, monograms and arms, including "a very fine New Zealand arms for the Premier."¹³⁶ However, his specialty was the engraving of postage stamp dies, and it was in this area that he later achieved some success. However, Robin Gwynn notes that Alfred Cousins in fact lacked William Bock's innate artistic gift, so that he never achieved real distinction in the field he had chosen, even although he had also tried moving to Sydney. The fact that stamp engraving work was still being repatriated to Britain had also militated against him. After his return to Wellington in 1905 Alfred Cousins worked as an engraver for Whitcombe and Tombs until he retired in 1922.¹³⁷

Nature of Business and Genre Produced

Jobbing Printing

Among the work taken in by the firm of Bock & Cousins were colour printing jobs. They produced such ephemeral items as posters, certificates, labels, stamps and theatre programmes. It was William Bock who designed the medals and certificates for the 1885 Wellington Exhibition, at which the firm themselves won a silver medal for engraving as well as being awarded a first prize for their engraving and die-sinking and also for lithographic and ornamental printing. Among their exhibits it was recorded that there were samples of the New Zealand beer-duty stamps, which were engraved on steel, and the lithographic and ornamental printing was said to have been of a high standard.¹³⁸ Reporting in *Typo* in May 1889 that the foreman A.G. Cousins (no relation to the partner Cousins) was embarking for Sydney, R.C. Harding commented that "his skill has been responsible in the last five years for much of the prestige of the firm in artistic job printing."¹³⁹ One certificate that was later printed by Bock and Cousins in February 1891 was for the School of Design, Education Board of the District of Wellington, an indication that tuition in design subjects was available in Wellington. The certificate was printed entirely in pale red letterpress with a decorative Victorian border.¹⁴⁰ Other items that survive from this firm in the Alexander Turnbull Library have been printed in several colours, and these include food labels and opera programmes, the latter, which are further discussed in chapter 11, being particularly interesting.

Featon's Art Album of New Zealand Flora

In spite of the general eighties economic downturn, and the concentration of colour printers on jobbing printing, the occasional New Zealand colour printer saw a market in this period for a publication that justified elaborate use of chromolithographic printing. Although, according to R.C. Harding, it was the Wanganui printer, A.D. Willis, who was the first New Zealand colour printer to have tried his hand at art printing, it was Bock & Cousins of Wellington that over the period of 1887 to 1889 printed and published Mr and Mrs E. H. Featon's *The Art Album of New Zealand Flora: Being a Systematic and Popular Description of the Native Flowering Plants of New Zealand and the Adjacent Islands*. This was a ground breaking work in that it was "the first fully coloured art book to be published in New Zealand."¹⁴¹ It was the presence in Wellington of the talented chromolithographic artist, William Bock, that made this work possible. (Plate 16.) (See also chapter 9.)

After Featon's Art Album

After the publication of the *Art Album* the partnership of Bock & Cousins did not last, and the firm was disestablished, following which William Bock again set up on his own, this

time in Brandon Street. The production of the *Art Album* had caused stress, part of which was a residual debt of £800.¹⁴² However, William Bock carried on business as Bock & Company, undertaking design, engraving and colour work for such items as illuminated addresses, seals and crests, as well as the letterpress and lithographic printing of maps, plans and other ephemera. The products from the die-sinking portion of this business included postage and beer duty stamp designs, and it was reported in *The Cyclopaedia* that at that time (1897) nearly all the postage and inland revenue stamps had been designed and engraved by William Bock. He had also achieved success in a Government competition for stamp designs:

His latest achievement as a designer was in connection with the competitive designs called for by the Government for a series of eleven revenue and postage stamps, when, out of 200 sets of designs, Mr. Bock attained the premier position, being awarded three first prizes, two second prizes, and three honourable mentions out of his set of eleven stamps.¹⁴³

The printing of specialist items such as these gave scope for Bock's colour expertise and many found their way overseas. Due to their intrinsic function, the carriage overseas of a proportion of stamps was assured, so that they simultaneously fulfilled more than one purpose. It is true to say that postage stamps have played a part in allowing the rest of the world to judge New Zealand colour printing standards, as well as giving the opportunity for the graphic communication of many aspects of the country. In his capacity as a designer and engraver of New Zealand stamps, William Bock played an important part in the creation of the local stamp issues well beyond 1914:

He contributed four values to the 1898 pictorial stamp issue, widely acclaimed as one of the contemporary world's most attractive. In 1906 he engraved the New Zealand International Exhibition set, the first locally produced large commemorative issue. Bock was the most important and innovative contributor to the development of New Zealand stamp production from 1875 to 1931.¹⁴⁴

Other items produced by Bock that were intended for special overseas occasions were, for instance, the illuminated addresses that were prepared for the Queen's Jubilee. On this occasion, one illuminated address was prepared on behalf of the New Zealand House of Representatives and the Legislative Council, and another on behalf of the Masonic bodies. It was said that with regard to the latter that it was William Bock who executed "a great part of the best work in these lines which is turned out in Wellington."¹⁴⁵ Thus William Bock had acquired a reputation for fine colour work both at home and abroad.

Plate 16: 'Frontispiece.'

Published in vol. 1 of *The Art Album of New Zealand Flora: Being a Systematic and Popular Description of the Native Flowering Plants of New Zealand and the Adjacent Islands* by Mr and Mrs E. H. Featon.

Printed and published at the Office of Messrs. Bock & Cousins of Wellington, 1889.

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Feather
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WILD FLOWERS AND BERRIES.

Alfred Cousins and Stamps

At the Government Printing Office, a department for the official printing of stamps had been operating since 1866, and in 1880-81, the Wellington firm of Bock and Cousins had engraved a set of duty stamps that were to be printed there. In the following years, the same firm also cut dies for stamps for Samoa and Tonga. In his article on Alfred Cousins, Marcel Stanley has stated that Cousins had won the bonus offered by the Postal Department for a design for the new 2 1/2d ocean postage stamp, his design having been judged as "very much the best" from the several received from various parts of the colony.¹⁴⁶ (*Literature Review*: 32.) Cousins was subsequently asked to prepare the die, and made engraving history for New Zealand in the doing. The design included the map of New Zealand at the base and an ocean steamer represented in the two upper corners, with the main design being the Queen's head enclosed in an oval. Up until this time any die that included an image of the Queen's head had always been provided from London, but Alfred Cousins went ahead and carried out the entire engraving, thus becoming the first in the colony to break from the tradition. Extracts from contemporary 1882 newspapers provided the information that the stamp would be printed in blue and brought into force at the beginning of the next year, and also confidently declared that Alfred Cousins had showed that "it is possible to do work of this class as well in Wellington as in any part of the Old Country."¹⁴⁷ Further work of this nature came to his hands when a new 5d. stamp was also needed under the new ocean mail system, and Alfred Cousins received the commission to carry out the work in spite of another engraver having submitting a lower tender. At the time of the report, the die had been cut and work had progressed to the proof stage, with the description giving the information that

the stamp is plain and neat having in the centre the Queen's head in purple.... The figure and letter '5d' is printed on side tablets in black letters on a white ground, and on a ribbon design appear the words 'New Zealand Postage and Revenue,' the border to the whole square being a filigree pattern."¹⁴⁸

Towards the new century, Both William Bock and Alfred Cousins took part in a competition to design a new issue of New Zealand stamps that were destined to be printed in colours. (See chapter 11.)

Other Colour Printers of Wellington

Lyon and Blair

John Rutherford Blair (1843-1914), one of the partners in the early Wellington printing firm of Lyon and Blair, was a printer, publisher, bookbinder, bookseller and businessman who also had come to New Zealand from Australia. Blair had first emigrated to Melbourne in 1860, where he had worked for the firm of Sands and MacDougall, before moving to Wellington in 1869 as a representative of that Melbourne firm. Soon after this, in 1870,

Blair went into partnership with William Lyon, who had originally arrived in Wellington with the third shipload of settlers, and had opened what was probably the first book and stationery shop on Lambton Quay. It was John Blair who added the printing and publishing branch to the firm of Lyon and Blair, building up a network of agencies from Westland to the central North Island.¹⁴⁹ Eventually Blair became sole proprietor of the business which was ultimately sold to Whitcombe and Tombs.¹⁵⁰

In 1871, it had been William Bock who was engaged as general manager of the Lithographic and Printing Department. For the firm of Lyon and Blair the 1870s was a period of growth in which the firm had flourished and begun to diversify. Part of this was the ability to undertake commissions for chromolithographic colour printing, and for this it was William Bock who brought with him the chromo-lithographic expertise. Lyon and Blair developed their colour printing capability, and this included high-class letterpress colour printing as well, an example of which appeared in *Typo* as a supplement to the issue for 27th December 1890. This item was a souvenir published “in commemoration of the fiftieth anniversary of the establishment of the firm” as a wholesale stationer. The compositor was acknowledged as E.E. Wright and the machinist as E.F. Weight, both of whom were with Lyon & Blair. (See Plate 17.)

Although cartographic production had been in progress in Wellington at the Survey Office since 1863, Lyon & Blair also produced a considerable number of maps. This firm operated a steam lithography division that was equipped for photolithography, a process that facilitated map production, and which had been in use by that firm at least by 1876. In that year Lyon and Blair had produced the eight folded diagrams placed at the back of the item ‘Deed of Consent, Contracts, Specifications, Prospectus, Plans, &c., &c.’ that had originated from the Wellington City Tramways Company Limited by this means. From a recent listing by John Muir of one hundred and eighty items printed by Lyon and Blair between 1874 and 1894 it was found that, in this sample, maps drawings and plans comprised around a fifth of the production, most of which were, at this stage, printed in black and white.¹⁵¹

For maps, however, the ability to print in colours was an advantage because of the wider

Plate 17: ‘1840 Souvenir 1890.’

E.E. Wright compositor, E.F. Weight, machinist. Printed at Lyon & Blair, Wellington.

Published in *Typo*, supplement to 4 (27 December 1890), foll. 152.

By permission of the Alexander Turnbull Library, Wellington, N.Z., New Zealand and Pacific Collection.

Ref. No.: S-L 363-1

SET IN WEST-EN TYPE, 25 DECEMBER, 1890.

E. E. WRIGHT, Composer.

F. F. WRIGHT, Machinist.

BY LYON & BLAIR.

graphic options thereby provided, and for some of their maps Lyon & Blair were using the process of chromolithography to fulfil the requirement for colour. An example is the 1889 plan printed in colour by Lyon and Blair (originally in black and white) for the Wellington City Council: 'Te Aro Reclaimed Land. Plan of Leasehold Building Sections...for Sale...Dec. 13th 1889' by T. Kennedy MacDonald.¹⁵² The extent of work undertaken by the firm of Lyon and Blair by 1885 is evidenced from the report of their presence at the 1885 New Zealand Industrial Exhibition. They were said to have mounted "a handsome and attractively arranged stall filled with samples of ruling, letterpress printing, lithography, embossing, die-sinking and engraving" as well as binding exhibits.¹⁵³ R.C. Harding also praised the general standard of printing from this firm. In mentioning that an issue of the *Catholic Times* had come to hand, Harding stated that because the printers were Lyon and Blair of Wellington, it was "needless to add that the work is good."¹⁵⁴ As advertised in *Typo* from 1889, Lyon and Blair also acted as printers brokers, importing from both British and American suppliers, and keeping stocks of all vital commodities for the colour printer including coloured inks.

Previously the firm had taken advantage of the local *Griffin's Colonial Printers' Register* to advertise. Lyon and Blair's frequently appearing advertisement had emphasised their own lithographic printing, and their ability to supply inks; for instance in the October issue for 1880 the following advertisement, the first of many similar ones, had appeared:

Lyon & Blair, Lambton Quay, Wellington. Booksellers and stationers, engravers, die sinkers, and LITHOGRAPHERS, bookbinders, paper rulers, and account book manufacturers. Letter-press Printers. Brass plates of every description designed and engraved....Agents for Messrs. Kidd & Co.'s printing inks.¹⁵⁵

A few months later a report in the February 1881 issue of the same journal mentioned that a sample of colour printing had been received from Lyon and Blair in the form of a "very handsomely gotten up business circular worked in six colours (American inks)—gold, red, green, brown, blue and black."¹⁵⁶ By that time America was well placed to supply the colour printers of New Zealand with inks as the manufacture of coloured inks was well established there and trade in such commodities was healthy. In 1881 the trade journal reported that:

There are thirteen large printing-ink works in the United States, and many other small ones. About half of these make coloured as well as black inks. Some large show-bill printers mix their own coloured inks. A leading manufacturer, basing his calculation on the product of his own mills, informs me that about 100,000lbs. of ink are daily made. I may here state that paper, type, and ink are imported and exported to a considerable extent.¹⁵⁷

As mentioned in chapter 5, maps printed by Lyon and Blair were included in the first 1879 *Handbook of New Zealand* which the firm also published. This publication was re-issued, but for the later editions it passed to the hands of George Didsbury the Government Printer, who around the time, as reported in *The New Zealand Press News and Typographical*

Circular, had also been prepared to take on workers from that establishment, after the completion of a large job:

The Philosophical Transactions, which are being printed at Messrs. Lyon and Blair's, are fast drawing to a close, and two of the hands have already left, but have been taken on...at the Government Office.¹⁵⁸

In 1890, at the time of Wellington's Jubilee, part of the celebration was a procession of floats, one of which featured the Typographical Society. The float consisted of a small printing office, complete with cases, imposing stone and press, all mounted on a lorry, from which the *Evening Post* Jubilee Poem, and the programme of the day were printed and distributed as the procession proceeded. In a following carriage were representatives from "the offices in the city recognised by the society." They were J.R. Blair of Lyon and Blair, W.R. Bock of Bock and Cousins, John Blundell of the *Evening Post*, and George Didsbury, the Government Printer. As the float passed Lyon and Blair's printing office, it was said that "three hearty cheers were given by the typos for each establishment."¹⁵⁹

The Government Printer

George Didsbury (1839-1893) was Government Printer from April 1865¹⁶⁰, the year after the move of the Government Printing Office from Auckland to Wellington, until his death in 1893. An official press had existed in New Zealand from 1842, but George Didsbury was the first long serving Government printer, his predecessor Joseph Wilson having served only briefly in Auckland after the decision in 1864 to establish a Government Printing Office along the lines of those operating in the Australian colonies, rather than continue to contract the Government work out as had been the practice for the previous eighteen years. An earlier Government Printing Office headed by Christopher Fulton had lasted less than two years, from September 1844 to March 1846.

As well as the official output of government papers, by the late eighties, general books and journals were being published from the Government Printing Office, especially after the shift to a long-needed new premises in 1888. In his *History of the Government Printing Office* (Literature Review: 32), W.A. Glue stated that the old worn-out Wharfedales were replaced with new machines, so that in the new building there was a total of fourteen machines in the machine room, nearly all of which were constantly running.¹⁶¹ At this time all machines were still being imported. The Government Printer had first introduced steam power for jobbing printing in 1866. In the matter of the development of photolithographic methods in the seventies, technical efficiency had been shown to have been important in this establishment. (See chapter 5.) The GP Office had commenced its own stereotyping and electrotyping in the early seventies, and two Crossley gas engines had replaced the steam

plant in 1881.¹⁶² The innovative attitude was in keeping with the two aims of the GP Office: to reduce Government expenses in accomplishing the year's general printing, and to increase its speed and accuracy.¹⁶³ From the early eighties, gas power began to replace steam, and in 1883, electric light was first installed.

Not long after the establishment of the lithographic branch at the GP Office in 1867, the workload in the branch had been so great that private assistance had to be sought to cope with the required volume of printing. Although supervision of the printing was the responsibility of the Government Printer, the Lithographic Branch was at this stage still under the control of the Lands and Survey Department, and in fact, it was not until 1901, after thirty years under the Government Printer's supervision that the lithographic branch of Lands and Survey was transferred to his full control. The work undertaken at the branch over this period included the lithographic printing of new maps and the correction of old ones, and was deemed to have been of a generally excellent standard.¹⁶⁴

The year of the move to the new building, 1888, was also the first year in which the annual job of printing the influential journal *Transactions and Proceedings of the New Zealand Institute* began at the GP Office: previously this had been a job that had been contracted out to James Hughes, the Lambton Quay printer,¹⁶⁵ although early black and white lithography had been accomplished by J. Earle at the Government Lithographic Press. Issued since the inception of the establishment of the New Zealand Institute in 1867, the *Transactions* constituted the first journal of science to be published in New Zealand.¹⁶⁶ The formal establishment, also in 1888, of the Australasian Association for the Advancement of Science further encouraged scientific publication as well as strengthening links with Australia. At that time, the general publishing policy at the New Zealand GP Office aimed to enable "the dissemination of useful knowledge amongst the people of the colony."¹⁶⁷

Many items published at the GP Office, including the *Transactions*, which were edited by James Hector, were now being printed with illustrations as well as text, and work was to a high standard. For the *Transactions*, the principal illustrative artist and lithographer for the first nineteen volumes was John Buchanan, who travelled extensively, "sketching the landscape, drawing maps, geological sections, animal and plant fossils."¹⁶⁸ The botanist Bruce Sampson has described Buchanan's black and white lithographs as "superb." Colour printing for the *Transactions* was initially carried out in England, for instance, the chromolithography to convey the colouring of a moth drawn by Walter Buller, an early New Zealand-born naturalist, to illustrate his article, *Notice of a New Species of Moth...* on

page 279 of the 1873 issue. J.R.H. Andrews (Literature Review: 30) states that “subsequent chromolithography for the *Transactions* was done in New Zealand,”¹⁶⁹ thus further scope for local colour printers was provided through this scientific publication. At times, the addition of some colour to book illustration undertaken at the GP Office was afforded by the use of tint-stones, and during Didsbury’s time as Government Printer this method was used for the first issue in three volumes of John Buchanan’s *Indigenous Grasses of New Zealand* which was published successively in 1878, 1879 and 1880. (See chapter 9.)

In spite of grumbling from some of the private printers that book publication at the GP Office was taking work that they considered was rightfully theirs, the list of books printed at the GP Office continued to grow. The official view of a committee set up in 1885 to examine the criticism was that “unless they were printed by the State they would not have been printed at all.”¹⁷⁰ Sometimes illustrative content for GP books was substantial, for instance, for the 1889 book the *Forest Flora of New Zealand* by Thomas Kirk, which was published with 142 plates of illustrations, all of which were printed at the Government Lithographic Department under the direction of Mr A. Barron, the work being carried out from 1885. This publication was sold at the competitive price of 12s 6d, in keeping with George Didsbury’s wish to bring it “within the reach of all,”¹⁷¹ but such a restriction also meant that the plates were in black and white. The tight financial position of the times probably precluded extensive colour printing ever being taken on at the GP Office in that period, the firm priorities being government work and the dissemination of print materials in the wider community. Other titles issued from the GP Office in the decade of the eighties include volumes 1-6 of John White’s *Ancient History of the Maori* published over the period 1887-1891; with a the volume of illustrations published in 1897, and two works, one by F. W. Hutton and the other by the Assistant Surveyor General, S. Percy Smith, on the 1886 eruption of Tarawera.

Although not eligible for judging because of its status as a Government Department, George Didsbury showed a fine collection of exhibits from the GP Office at the New Zealand Industrial Exhibition in 1885, ranging across the various branches of printing and bookbinding carried out for the Government Printer, and which included examples of the department’s electrotypes and stereotypes. Electrotypes included some from woodcuts, others for borders (cored for inserting type), and those for printing beer-duty stamps (single and in sheet). Specimens of the wax moulds for electrotypes were also shown. In the Stereotype exhibit were examples of papier maché moulds for making stereotypes, stereos that had been bevelled for mounting on patent blocks, and some that were mounted on cedar

blocks. It has been pointed out by Glue that the use of indigenous materials was encouraged at the GP Office, so that New Zealand totara was also a wood that was chosen for mounts. Included in the book section of the large GP stand were copies of the *Indigenous Grasses of New Zealand*, in elegant morocco binding, five volumes of the *Transactions of the New Zealand Institute* in calf with gilt tops,¹⁷² and a copy of Dr Hector's *Handbook of New Zealand* in cloth extra.¹⁷³ In London in the following year, maps and illustrations (which were listed) documenting the results of surveys in New Zealand were shown at the Colonial and Indian Exhibition. A report published in the catalogue of New Zealand exhibits mentions them: evidently colour work featured prominently:

There are maps of each island, showing the density per square mile of the European population, and a similar map for the North Island, showing the location and relative density of the Maori population by different shades of colours. There is a series of chromo-lithographs of portions of the settled districts and towns of New Zealand, which will show some of the most pleasing rural and industrial scenes and landscapes, which are similar to those in the most favoured parts of the United Kingdom...the chromos were drawn on stone by Mr. E. Graham. Mr A. Barron, the chief of the Surveyor-General's Department supervised and directed all these very interesting and scientific exhibits, necessarily involving a very large amount of plodding application.¹⁷⁴

In September 1888 a move to a new building was made, but the Lithographic Branch, a part of the Lands and Survey Department, appears to have remained in the old building. In the April 1889 issue of *Typo* R.C. Harding stated that George Didsbury had just taken him through the new premises, where he had noted twelve cylinder machines in the press-room, and only two platens, an Arab and a Minerva: "small platen machines are not suited for an office where most of the work is in large sheets and long numbers." He mentioned that all railway printing, including ticketing was done there and that "the stamp-printing is not now under the care of the Government Printer...No lithographic work of any kind is done on the premises, being all executed by the Survey Department. In some respects this is a drawback—works which were otherwise ready for the binders lying unfinished awaiting the plates."¹⁷⁵ On the 8th October 1890 the disastrous fire which had taken hold in the Lithographic Branch gutted the old GP Office building. W.A. Glue reported that when firemen entered at the bottom of the building they were faced with molten lead and lithographic stones which could weigh up to a ton each falling through the ceiling, forcing them to withdraw.¹⁷⁶ Everything was lost, including records of the office, and valuable lithographic and photographic equipment. There was no insurance, but worse, many of the destroyed lithographic stones related to early maps and drawings, and these were irreplaceable.¹⁷⁷

Shortly before this, in August 1890, R.C. Harding had included a report in *Typo* from the Survey Department for the year past, in which the up-to-date state of the equipment had

been highlighted, but which also commented on the lack of time by then for research in the busy work environment. He said that the department

has now an establishment capable of printing every kind of lithographic, photographic, and some of the process work of older countries...It is sometimes vexatious that so little time can be given to working out the details of photographic processes; yet, in the midst of a constant flow of work, Mr. Ross, chief of the lithographic office, occasionally finds time to make a step forward in something new.¹⁷⁸

However, the October fire was shortly to instead generally retard progress. Also in October 1890, it was reported in *Typo* that the GP Office was to take control of the Stamp-Printing Branch of the Stamp Department, and that new equipment for the work included a Napier and Sons double platen, an American Colt's Amory press, a Newsum's gumming machine, and two Blackhall's rotary perforating machines, as well as steam-heated cupboards for drying the sheets. A new series of stamps, for which the steel dies were being executed locally, was for the Government Insurance Department. Electrotypes were being made from the dies.¹⁷⁹

It was just after the turn of the century, in 1901, that the employment of process engraving was boosted in the GP Office by the appointment of John Mackay, who succeeded to the position of Government Printer in 1896 after Samuel Costall's short term of office following the death of George Didsbury. The period of economic hardship in the eighties and nineties had seen the GP Office concentrating on core business using existing equipment, and while work volumes and staff had both increased, capital outlay even for the installation of monotypes and linotypes had been delayed, but the new typesetting machines, although dreaded by the composing room work-force, had made their appearance by 1903. These modernisations brought the GP Office into line with developments that had taken place for both plate making and typesetting, and this ushered in updated methods for the production of both texts and images. Under John McKay, who retired in 1916, the establishment kept abreast of the times to the end of the period under study, and by this time the advent of the First World War meant that the GP Office was operating in a period that

bills and publications such as the *Journals*, the *Appendices to the Journals* and *Hansard*, much job printing was being undertaken.

Daily work included the production of items such as letterheads, tickets, (including railway tickets), stamps, posters and cards. Some of the jobs ran to colour, but typically consisted of the addition of one other colour such as red or blue to the standard black. For example, in 1885 a thermal springs poster was printed for Crown Lands, beer duty stamps and query forms had been printed for Customs, the latter in red and black, as well as the Official Programmes for the 1885 Exhibition, some in blue and some in red. 1887 jobs included menu cards for Government House and posters and Bellamy's tickets for the General Assembly, while in 1888 consignment notes in blue had been produced for the Railways, and for Post and Telegraph, tags on vellum had been printed in red and black.¹⁸⁰

The Trade Ledger, which lists sales to named firms and individuals, reveals for instance, that in 1907 the GP Office carried on a major trade in Wellington with Whitcombe and Tombs, to whom they sold not only books but also maps. At that stage, for example, an entry in the ledger shows that the *Forest Flora* was still being sold for 12/6d,¹⁸¹ while from another entry it is apparent that waste paper from the GP Office was being sold to New Zealand Paper Mills. From the Expenditure Register, where lithographic costs were shown separately, it could be seen from the amounts expended in such categories as machinery, paper, and salaries, that it was the workforce salaries that were the major cost to the department, whether for letterpress or lithographic production. To cover the range of printing departments adequately, various categories of specialist expertise was required to meet the printing needs of the government. It could be seen also that colour printing was occasionally required for a job, but made up only a small part of the total volume of printing carried out in this establishment, and on the occasions in which colour had been employed, whether for letterpress or lithographic printing, in order to adhere to laid down policy, at the GP Office it appears to have been accomplished as economically as possible. An example of the colour work from the Wellington Government Printing Office appeared in the the British *Penrose Annual* of 1909-10, demonstrating the quality work being accomplished there by then. The printed image in greys and blues described as a 'Two-Colour Print' was a half-tone photograph of 'The Remarkables, Lake Wakatipu N.Z.' printed in black and light blue by J.T. Inkersell within decorative scroll borders in oval and rectangular shapes designed by J.L. Martin, and which appeared in two greys, light blue, and with black edgings. The greys were subtly printed by using a spatter technique: black over white produced light grey, while black over solid blue produced darker grey.¹⁸² (Plate 18.)

Robert Coupland Harding (1849-1916)

While in the public arena the Government Printer was charged with serving the Government of the day, and through it the population of New Zealand as efficiently and effectively as possible, it was to be in the private sphere that the the question of raising colonial printing standards was to be more thoroughly hammered out. Particularly in the area of letter-press printing, New Zealand's own printing guru, Robert Coupland Harding became a guiding light, especially where the subject of typographic design, decorative and display printing was concerned. Although born in Wellington and spending much of his early childhood in Wanganui, in 1859 Harding moved with his family to Napier where he first met William Colenso, the missionary printer. With his father also in the trade, Robert Coupland Harding grew up around printing, and it was in Napier that he served his apprenticeship and later worked in his father's newspaper business, the *Hawkes Bay Times*. However, his own interest ultimately lay in job printing, a field in which his innate ability for design found its outlet in his interest in typography which became a lifelong enthusiasm, and which is exemplified, for instance, in the almanacs which he published, entitled *Harding's New Zealand Almanac and East Coast Local Guide*. D.F. McKenzie has stated:

It was undoubtedly that larger commercial and cultural mission that drove Harding as a writer and printer; and a significant function of his Almanacs in serving it, full as they were of advertisements, was the chance they gave him to display new type and the arts of the jobbing printer. These were his ruling passion...¹⁸³

However, his position in the New Zealand islands at such distance from the Old World printing centres must have meant a considerable effort to maintain the necessary ongoing communication by correspondence with many printers and others working in the typefounding industry as he collected specimens and kept up with developments.

By means of *Typo*, Harding's instructive criticism in the field of typography and ornamental printing was to reach not only beyond New Zealand printers to those in Australia, but further, to an international printing audience, as he undertook his long series of articles on the art of typographic printing that were successively presented in *Typo* between 1887 and 1897. In fact, the influence of Robert Coupland Harding was such that it has been said by the authors Roderick Cave and Kathleen Coleridge that:

the local trade's coming of age is probably best dated as 1887, when Robert Coupland Harding began his trade journal, *Typo*. This was a remarkably sophisticated journal for so young a country, just as Harding's correspondence with typographers overseas and the columns he contributed to the *Inland Printer* show a breadth of knowledge and understanding of design altogether remarkable in one who never left New Zealand.¹⁸⁴

Plate 18: 'The Remarkables, Lake Wakatipu N.Z.'

Two-colour print by the Government Printing Office, Wellington.

Design by J.L. Martin, engraver, J.T. Inkersell.

Published in the *Penrose Annual* vol.15 (1909/10), foll.76.

Held: Victoria University of Wellington Library.

J. T. Inkersell,
Govt. Printing Office, Wellington, N.Z.

Design by J. L. Martin.

Harding had undertaken the publication of this journal single-handedly in Napier where he had initially been in business from 1873, and then in Wellington where his specialities were reported as being book, scientific and art printing.¹⁸⁵ *Typo* was printed from 1890 at Harding Wright and Eyre. In 1892, the following notice appeared in *Typo*:

The partnership between Messrs Harding, Wright & Eyre, printers, Wellington, has been dissolved by mutual consent, the dissolution taking effect from the 31st October. Mr. R. Coupland Harding now carries the business in his own name.¹⁸⁶

As well as advice, the journal provided examples to follow, and these included examples of letterpress colour printing, for instance, to show ways of using colour simply and appropriately for borders, ornaments and other decorative work. One example, in the October issue of volume 7 (1893), is a headpiece printed in five colours; pink, blue, teal, and brown, with a light sage background. Also shown are ornaments variously printed in the colours red, blue and green; while brown is used for a decorated initial. Examples of other ornaments included the “new Border 140, Gothic in style” which Harding considered to have “a fairy-like lightness and grace peculiarly its own.”¹⁸⁷

The title-pages to volumes one to six of *Typo* were themselves all printed in colours, thereby providing excellent specimens of this type of letterpress colour printing from that late nineteenth century period. For instance, the title-page from the first 1887 *Typo* volume leads by example in this area of colour printing in relation to typographic design. Harding himself mentioned the title-page for volume one in an advertisement for the journal: “the title is worked in four colors, on a fine quality of paper.”¹⁸⁸ The excellent 1891 title-page for volume five, printed in the period after Harding came to Wellington at Harding, Wright & Eyre, is another notably fine specimen, printed in green, red, navy blue and light yellow, admirably exemplifying basic rules of colour harmony and contrast, the observance of which he deemed essential to successful display typography. (Plate 19.)

From the beginning, R.C. Harding had made it clear that he wanted to showcase the best work from other printers in his journal:

We hope occasionally to present our readers with supplements showing choice examples of work, in black or colors which will show that the printers of this colony are in no wise behind their fellow-craftsmen elsewhere.¹⁸⁹

Some of the examples commented on by Harding, for instance in the May issue for 1890 under the heading ‘New Zealand Printing Specimens’, show that colour was being applied to jobbing work by New Zealand printers of the day. Specimens sent to Harding for the month included a “Clearance-card of the Canterbury Typographical Association...a neatly designed and well-printed piece of color-work [which] does credit to the Times job-room”;

from Messrs W.H. Foden & Co., Timaru, “a neat and attractive business-card in three colors”; and “a testimonial, in gold, green and rose-madder, very well printed on a Main machine, by Mr. J. Caygill, at the Union Office, Christchurch.”¹⁹⁰

Harding’s journal, which was in the nature of a standard setter, was widely available in New Zealand to printers and others, not least because it was held in public libraries. One correspondent, the Honorary Secretary of the Waipukurau Public Library Committee, wrote in 1890 to say:

R.C. Harding Esq.
Waipukurau
July 18th 1890

Dear Sir

The committee of the Waipukurau Public Library begs to tender you their sincere thanks for your liberality in supplying the institution with your paper (*Typo*) during the past year free.

I am
Yours sincerely
Ian W. M Cray
Hon Sec¹⁹¹

Other letters written to Harding concerning *Typo* demonstrate the esteem in which the journal was held. Favourable comments came from places as far apart as Timaru on the one hand, and Edinburgh on the other. C. Piazzzi Smyth, to whom Harding had sent a copy of *Typo* on 23rd July 1888, returned thanks from Edinburgh, and, mentioning that he had sent it on to a friend in New York, said that he found it “as exquisite in printing and ornamentation as ever,” while Tom Mills, who was also well-known as a writer on trade matters, wrote to Harding from Wellington on 27th April 1888 saying “I have already mentioned your *Typo* to several true Craftsmen & they [have] asked me to show them a copy, & probably will subscribe...” However the letter from W.H. Foden, a subscriber, indicated that many New Zealand printers sadly would probably never benefit from Harding’s educative effort.

Mr. R.C. Harding
Timaru,
Feb. 18, 1888

Dear Sir

I enclose a Postal Note for two years sub. to *Typo*. The paper deserves the support of all printers, but I know there is but a very small number who admit they can be taught anything in regard to the art, and from this fact I conclude that the number who support you is small. Your articles on display are the best I have read, treating as they do of modern appliances. I send you a couple of items, which you will use if suitable.

Wishing you every success
I remain, yours faithfully
W.H. Foden¹⁹²

Plate 19: Title page: *Typo: A Monthly Newspaper and Literary Review*, 5 (1891).
Published in Wellington by Harding, Wright and Eyre. (Size: 27 x 21cm.)
By permission of the Alexander Turnbull Library, Wellington, N.Z., Archive of New Zealand Printing,
Special Printed Collections.
Ref. No.: SPC00-428.

1891

TYPO

Volume V.

A MONTHLY NEWSPAPER AND
LITERARY REVIEW

DEVOTED TO THE ADVANCEMENT OF THE TYPOGRAPHIC ART, AND THE
INTERESTS OF THE PRINTING, PUBLISHING, BOOKSELLING,
STATIONERY, AND KINDRED TRADES.

Wellington, New Zealand:

R. COFFLAND HARDING, PROPRIETOR AND PUBLISHER,
LONDON: JOHN HADDON & CO., BOYERLY HOUSE, SALISBURY SQUARE, E.C.
1892.

Robert Coupland Harding, whose interests extended beyond printing to activities such as lay preaching and topics such as the reform of English spelling, was the subject of a biographical article in R.A. McKay's 1940 *History*, (which is incorrectly headed Richard Coupland Harding) and also of an article in *The Dictionary of New Zealand Biography* by D.F. McKenzie, in which he commented that by the time of Harding's Wellington era, because *Typo* had taken on an over-riding importance, his own business interests faltered. McKenzie stated of Harding's Wellington business:

It was not a success. Typo's appearance became intermittent, and ceased altogether with a double issue for January-February 1897. His Wellington enterprise came at last to its sad end with the sale of his business and the dispersal of his remarkable collection of types, and for the remainder of his working life he was employed as a journalist and editor on Wellington's *Evening Post*.¹⁹³

McKee and Gamble

One of the largest Wellington printing firms around the turn of the twentieth century was that of McKee and Gamble, which was established in 1891. This was a New Zealand printing firm in which innovation lay at the heart. An article in *The New Zealand Mail* 1896 Christmas Number accompanying a photograph of the exhibit this firm mounted at the 1896/97 Industrial Exhibition declared:

It is not too much to say that the rapid progress during the past six years of this now well-known firm is unparalleled in the history of the printing trade in New Zealand.¹⁹⁴

Arthur McKee (1863-1943), a professional journalist and publisher who had come to New Zealand from Liverpool in 1890, had brought with him a linotype machine¹⁹⁵ which appears to have been among the first in the country. Henry Gamble, who ran a business in stereotyping and electrotyping before the arrival of McKee, brought his keen interest in experimental process engraving to the partnership, and it was he who supervised production methods in the printing factory which was operating on Customhouse Quay about two years after the firm was first established. Henry's brother James Gamble was the factory superintendent, and Arthur McKee, a man of vision, managed the firm. The partnership was a fortunate combination of abilities, between McKee who also possessed great entrepreneurial skill, and Gamble, the innovator who was interested in keeping abreast of the technical side. By 1896 they had built the business to the point where they employed over a hundred people, and their trade extended throughout New Zealand and Australia.¹⁹⁶

McKee and Gamble designated themselves in 1897 as

Publishers, Engravers by all modern methods, Art Lithographers and Printers, Electrotypers and Stereotypers, Advertising Specialists, Paper Merchants, Manufacturing Stationers etc.¹⁹⁷

Among the pioneers in New Zealand of photomechanical engraving, McKee and Gamble became influential in the field of process engraved illustration, but at first had carried out

their experiments in an office on Lambton Quay, taking on commercial printing when ongoing finance had to be found after about a year. Experimentation continued in their spare time with the use of improvised equipment, when, for instance, “an unusually large-size packing case did duty as a dark room.”¹⁹⁸ Around the middle of the decade they were able to market their process engravings, and by the turn of the century the business was booming, although by then, in 1897, the partnership had been dissolved when Henry Gamble went elsewhere, and at this point the firm became McKee and Company.¹⁹⁹

The firm possessed the expertise and equipment for making engraved blocks on many surfaces such as copper, brass, and wood, and by all the latest methods including a wax process. Stereotyping and electrotyping was the field in which the firm had first gone into business. The production of such templates allowed many images, gathered from around the country, to be held in stock and reproduced whenever called for. As the twentieth century approached the Photomechanical Process Department at McKee and Gamble kept abreast of the times, partly due to an active research endeavour, and the newer processes rapidly began to supplant the older block-making techniques.

This firm demonstrated a modern approach, and had the distinction of being the first in the Southern Hemisphere to power the presses with electric motors. Among the machines installed at McKee and Gamble were two double royal Wharfedales that were dedicated to the printing of process engravings, the output of which was said to be the largest in Australasia. According to the first 1897 volume of *The Cyclopaedia*, which covered the Wellington Provincial District, they had by this time also installed electric lighting throughout their plant, while the Photographic Department boasted “the most powerful lamp in the Colony.”²⁰⁰

Being well-equipped to produce both line and half-tone engraving, McKee and Gamble undertook a variety of illustrative work, quotes for which were said to have been below London prices. After Henry Gamble had left, his brother James remained as the overseer of the factory which at the time possessed a well-equipped machine room, allowing the firm to accomplish printing of all kinds, including art printing. It is thought that, appropriately, the photolithographic re-issue around 1891 of a three-part panorama of a view of Wellington by Luke Nattrass, originally lithographed in London, may have been one of their first publications.²⁰¹

Two works for which extensive engraving work was undertaken in the mid-nineties were published in fortnightly parts, subscribers paying a shilling a part. These were *Glimpses of*

Australia, for which a total of 384 photo-engravings were prepared by McKee and Gamble, and which was published in Australia by Gordon and Gotch and the *Imperial Album of New Zealand Scenery*, for which McKee and Gamble were publishers. At the 1896/97 exhibition, copies of *Glimpses of Australia* were shown, and it was said that this work was projected to have the largest circulation of any book yet produced in the colonies. In winning such a large contract, McKee and Gamble had brought much illustrative work to Wellingtonians, and this was to continue as the *Imperial Album of New Zealand Scenery* was published, entailing the printing of several hundred thousand parts which was by 1896 being “extensively bought by the public, principally for the purpose of sending to friends in the Old Country.”²⁰² The process engraving being produced in the hands of McKee and Gamble was well-regarded:

As to the quality of the engravings, the Australian and New Zealand Press are unanimous in the verdict that McKee and Gamble’s work is equal to the high-class work of England and America. Both these publications form a sympathetic link between the people on the two sides of the globe, and constitute a magnificent advert for the colonies.²⁰³

McKee and Gamble were also printers of the first volume of the 1897-1908 landmark publication *Cyclopedia of New Zealand: Industrial, Descriptive, Historical, Biographical Facts, Figures, Illustrations*, and were the contractors for the thousands of engravings to be made for that work. To publish this monumental work the Cyclopedia Company had been formed, with Arthur McKee as one of three directors.²⁰⁴ The extensive use of half-tone process work in these three extensively illustrated publications, which together necessitated an expenditure of over £60,000 probably did much to bring familiarity with printed illustration of the kind to the general public of Australasia, and through its good standard to help lay the foundation for its later acceptance in the marketplace in colour form also.

Part of McKee and Gamble’s broad printing capability was for colour printing, which was used for many in-demand items in the Art-lithographic and Photolithographic Departments. By the turn of the century it was said that the firm was able to turn out, to a high standard, “anything from a tiny label of a single printing to the mammoth poster with the flame of innumerable colours.”²⁰⁵ *The Cyclopedia* reported that:

Label and ordinary commercial work are strong points, but it is particularly in the higher class of work that Messrs. McKee and Gamble excel. Some very fine show-cards are on view, especially those of the Empire Tea Company...and in chalk work the life-size portraits of Sir George Grey, Rev. L. M. Isitt, and Archbishop Redwood, and a view of old Wellington, have not been excelled in the colonies. Then, there is an excellent display of calendars, menu cards, almanacs, advertising novelties and the like, all of which are remarkable for chasteness of design and colour.²⁰⁶

That standards were high was due not only to the latest machinery, but also to the quality of the workforce:

Great care has evidently been exercised in the selection of artists and workmen, and to this fact is attributable the production of the really excellent work which has spread the reputation of the firm far afield.²⁰⁷

Although photolithography was employed in many ways, its chief use at the firm of McKee and Gamble was for reduction work in connection with the printing of maps and plans, many of which were printed in colour. (See chapter 11.)

Brown Thomson and Co. (Robert Burrett)

The firm of Brown Thomson and Co was another private Wellington firm that undertook map-printing, and this was for the reason that they had installed a large lithographic machine. This firm, first established by Robert Burrett, and which around the turn of the century had become the second largest after Whitcombe and Tombs in Wellington, specialised in commercial and law stationery printing. Burrett had set up in 1857, opening the second book and stationery business in Wellington in Manners Street. It has been mentioned that when Herbert Deveril had left Wellington in 1885, Robert Burrett had bought equipment from him to expand the business as a wholesale and manufacturing stationer, lithographer and contractor for the New Zealand Government and North Island Railways. By that time, the firm was apparently well-known for its lithography, as was stated in the records from the New Zealand Industrial Exhibition of that year:

Robert Burrett, Wellington, exhibits a case containing some good specimens of bookbinding, both letterpress and commercial. He also shows a case of the well-known lithographic and engraving work turned out at his office, as well as letterpress printing.²⁰⁸

The machinery in use around the turn of the century when the firm had become Brown Thomson and Co., had included "a double demy and several smaller litho machines and presses, printing machines and presses, and a very fine arming press, or gold-blocking machine."²⁰⁹ Due to their having the largest lithographic machine in Wellington, Brown Thomson were apparently often called upon by Lands and Survey to print issues of large maps. Brown had previously learnt the trade with Lyon & Blair, and Thomson, who superintended the lithographic, engraving printing and bookbinding departments, had completed his apprenticeship in Glasgow with McKay and Kirkwood in 1861.

Palmerston North

Joseph Smith

Also resident in the lower North Island in the nineties was another colour printer of note, Joseph Smith of Palmerston North. Smith had bought the Palmerston North Printing Works in 1894 from the widow of its previous owner, J.J. Cherrett, although J.P. Leary had originally been responsible for the sound establishment of this business in 1875. This firm was said to have always been trade leader in all classes of work in that district. Although a relatively small firm, employing six to eight hands, it was well equipped with machinery

that included a Payne's double royal cylinder machine, as well as several platens. In addition to bread-and-butter commercial printing of such items as draper's counter books, work was undertaken for many organisations in the area such as the drainage boards. The firm also undertook a variety of job printing to produce such items as labels, envelopes and seed-bags, but their speciality was the printing of theatre posters.

Palmerston North, the chief town of the Manawatu, was by 1895 well endowed with entertainment venues, having by then two theatres, the Royal and the Lyceum, as well as several halls belonging to friendly and other societies. It also boasted an Orchestral Society which, reportedly very strong in membership, had "made its mark on the district" through the concert series that it presented during the season.²¹⁰ For such activities, posters, programmes and fliers would have been required. Smith, who specialised in such theatrical job printing, claimed that at the time his was "the only office between Wellington and Wanganui capable of turning out large posters and general colour printing."²¹¹ Joseph Smith had emigrated to New Zealand from Shropshire in the sixties, and after serving a printing apprenticeship at the *Wairarapa Mercury* in 1881 had himself begun a paper, the *Wairarapa Star*, in partnership with Mr Hogg. Later, these two men also had the proprietorship of three other Wairarapa newspapers before Smith bought the Palmerston North business in the mid-nineties.

Wanganui

Having the advantage of a river port only a short distance from the mouth, Wanganui was potentially well-placed for its colonial businesses to grow at a time when the major means of moving both imported and exported goods was by sea. Service and supply industries that grew in tandem with the development of the town of Wanganui included bookselling and printing businesses such as those of H.I. Jones and A.D. Willis. The first press in Wanganui had been constructed there in the eighteen fifties in order to print a newspaper to succeed the weekly news sheet that initially had been published for a few weeks in 1853 by Francis Watts. Henry Stokes, who wished to found the newspaper, enlisted the Rev. C.H. S. Nicolls, the head of the Industrial School (now Wanganui Collegiate) who had printing experience formerly gained in Leeds, and Peter Williams, "a millwright who had built many flour-mills in the district" to help him build the press.

Together they constructed of maire wood and iron a very creditable press which was used at Collegiate school for many years.

In 1856 the first copies of the *Wanganui Chronicle* were printed. Later, Stokes had obtained a printing press from Sydney, "which was set up in a shop on Taupo Quay."²¹²

H.I. Jones & Sons Ltd.

In the the *Wanganui Directory* for 1856, H. Ireson Jones was listed simply as “agent”, but ten years later, as “bookseller, Taupo Quay.” It had been in the year 1860 that H.I. Jones (1822-1906) had set up in Wanganui as a bookseller, founding a business that was to last almost until the close of the twentieth century. By 1878, the business had grown considerably and was by then supplying commercial stationery, and publishing *H.I. Jones’ Shilling Almanack and Directory*, which was in that year printed in Wellington by Lyon and Blair. Two years later, in an advertisement that appeared in the *Wanganui Herald* of 28th August, H.I. Jones characterised his business as printer, bookbinder, machine paper ruler, manufacturing stationer, bookseller, stationer, and news agent of Victoria Avenue.

Henry Jones had emigrated from Oxfordshire in 1849, and by 1853 settled on a farm on the Wanganui river. After a period in the army, Jones built up his Wanganui business, and in his spare time was active in town affairs, particularly serving on educational bodies, for instance, he served on the Provincial Government school committee. As well, Jones had been on the committee that saw the building of the Wanganui River bridge, a development that was vital to communications for the developing town. By 1911 it was said that the history of H.I. Jones was consonant with the history of Wanganui, “for the business has grown with the town.”²¹³ From the early seventies, three of Henry Jones’ five New Zealand-born sons, Lloyd, Fred and Leonard (who died in 1877), had run the business, while Henry Jones retired to run the farm. After their father died in 1906, Lloyd and Fred became sole proprietors of the business which had become a large concern, with wholesale and retail printing and bookbinding departments. The second generation was also known in Wanganui for their public spirit, and in the business made a name for peaceful employer/employee relations, which was a factor that made for stability in this long-lived firm.

The 1880 advertisement in the *Wanganui Herald* had shown the printing capability at H.I. Jones to have been considerable by then:

Plain, fancy, and ornamental Printing of every description turned out in a superior manner, Circulars, Bill Heads, Cards, Tickets, Posters, Pamphlets, Catalogues, Drapers’ and Grocers’ Bags, Labels and Counter Slips, &c.²¹⁴

The variety of machinery installed at the time was described as being driven by water-power, enabling large orders to be rapidly and cheaply executed. The plant included a late model Harrild machine, as well as machinery for a variety of purposes, such as embossing and paper ruling.

By 1886, H.I. Jones was advertising in their *Almanack* as having the ability for many branches of printing, including “every description of Commercial, Ecclesiastical, Societies’

and Law Printing, as well as jobbing printing of all kinds.” In keeping with H.I. Jones interest in education, the bookselling side, as well as advertising “a large assortment of books in every department of literature always in stock” was able to supply school books and other requisites, with “liberal terms” for teachers. Trade was done with other parts of the country by postal sales, with periodicals and newspapers being sent out to country subscribers, and by 1911, it was said that “the ramifications of the firm extend throughout the Dominion, manufactured goods, books, etc. being sent to all parts.”²¹⁵

Although the specialty of H.I. Jones and Son was bookbinding, for which they had received medals and certificates at the New Zealand Exhibition just prior to 1911, it can be seen that at the printery there had been a capability for colour printing at least from the early 1880s, as a letterpress concert programme printed in several colours by this firm has been preserved in the Alexander Turnbull Library.²¹⁶ In *H.I. Jones' Shilling Almanack* for 1886, various arms of the business were advertised at the top of successive pages, with “Colour Printer” appearing on page 9. In fact, colour printing had been employed in the 1886 *Almanack* itself for the depiction of ‘Signals in Use at the Wanganui Flagstaff’ for which simple colour printing in red blue and black was used informationally. (See chapter 9.) Over the years, it was for its bookselling and commercial printing that the Wanganui firm of H.I. Jones became well-known, rather than for art printing, which became the province of A.D. Willis, the other large Wanganui printing firm, a case study of which is the subject of the next chapter.

New Zealand Colour Printers in 1914

At the end of the period under study, new technological possibilities were once again opening to printing businesses with the introduction of offset printing methods. This was an advance that was to have far-reaching effects, especially later in the twentieth century. From the survey in this chapter, especially of the lower North Island colour printers, it has been seen that over the first fifty years after colour had been introduced into New Zealand lithographic printing, colour printers throughout the country had been employing the technology at their disposal to bring colour to the marketplace of print, especially in the area of jobbing work. Printers were far from standardised in their approach to colour printing and many combination techniques were in evidence in New Zealand businesses by the end of the period in 1914. In addition to the use of letterpress colour, innovative ways of adding colour for graphics were being tried as the newer tri-chromatic processes were taking hold, but it is notable that, as a means of printing in full colour, chromolithography remained a process well-used by many New Zealand printers to the end of the period.

In Section V the evidence of the primary artifacts, the colour print products, will be examined to discover how the New Zealand printers were using the processes at their disposal to serve the marketplace of print. From a cross-section of the printed genre it will be seen how printers were undertaking colour work for such items as prints, maps, plans, books and the special numbers of the weekly newspapers, in addition to such ephemeral items as posters, labels, cards, stamps, catalogues and programmes.

¹ *The Times Printing Number*, 1912, 174.

² Griffith, P.A., Ross Harvey and Keith Maslen, eds., *Book & Print in New Zealand: A Guide to Print Culture in Aotearoa* (Wellington: Victoria University Press, 1997), 54-55.

³ R.A. McKay, ed., *A History of Printing in New Zealand 1830-1940* (Wellington: R.A. McKay for the Wellington Club of Printing House Craftsmen, 1940), 231.

⁴ A.H. McLintock, ed., *An Encyclopaedia of New Zealand*, 3vols. (Wellington: Government Printer, 1966), 871.

⁵ *Typo*, 3 (December 1889): 145.

⁶ *Typo*, 1 (August 1887): 69.

⁷ *Typo*, 5 (March 1891): 41.

⁸ Peter Franks, *Print and Politics: A History of Trade Unions in the New Zealand Printing Industry, 1865-1995* (Wellington: Victoria University Press, 2001), 26.

⁹ McKay, ed. *A History of Printing in New Zealand*, 130; 135.

¹⁰ Roland Elzea, *Nostalgic Journey: American Illustration from the Collection of the Delaware Art Museum* (Wilmington, Del.: the Museum, 1994), 3, quoted in Ruth Copans, 'Dream Blocks: American Women Illustrators of the Golden Age, 1890-1920', in Catherine J. Golden, ed., *Book Illustrated: Text, Image, and Culture 1770-1930* (New Castle, Del.: Oak Knoll Press, 2000), 242.

¹¹ Richard Russell, 'The Lyons Lithographs', in *Matrix*, 19 (1999): 138-140.

¹² Alexander Turnbull Library, Drawings and Prints, item, ref: A-104-049-a

¹³ Anne Kirker, 'Lithography in New Zealand: A Coming of Age', in Pat Gilmour, ed., *Lasting Impressions: Lithography as Art* (London: Alexandria Press, 1988), 296.

¹⁴ National Archives Head Office, Wellington, Patent Office Black Folder, 'Historical Note', [4].

¹⁵ *Typo*, 5 (December 1891): 159.

¹⁶ Franks, *Print and Politics*, 63.

¹⁷ *Ibid.*, 26.

¹⁸ *Ibid.*, 71.

¹⁹ Roger Blackley, *Two Centuries of New Zealand Landscape Art* (Auckland: Auckland City Art Gallery, 1990), 80.

²⁰ Auckland Public Library, The Grey Collection, *The Printers' Register*, no. 149 (November 6, 1875): 99.

²¹ Dr. W.B. Sutch, *Poverty and Progress in New Zealand: A Re-assessment*, [2d rev. ed.] (Wellington: Reed [1969]), chronological chart at back.

²² Franks, *Print and Politics*, 32.

²³ *Ibid.*, 40.

²⁴ A.G. Bagnall, ed., *New Zealand National Bibliography to the Year 1960*, (Wellington: Government Printer, 1969-1985), 1, pt.1, item 1804.

²⁵ *Typo*, 1 (February 1887): 11.

²⁶ *Typo*, 5 (December 1891): 149.

²⁷ *Ibid.*

²⁸ *Typo*, 2 (1888): December supplement, foll. 116.

²⁹ *Typo*, 2 (1888): 84, etc.

³⁰ *Typo*, 2 (1888): 50.

³¹ *Typo*, 1 (July 1887): 55.

³² Griffith, Harvey and Maslen, eds., *Book & Print in New Zealand*, 46.

³³ The Auckland *Weekly News*, August 12, 1876, 24.

³⁴ *Typo*, 2 (1888): 32 etc. (first appearance of this advertisement).

³⁵ *Typo*, 2 (1888): 48, etc.

³⁶ *Typo*, 3 (1889): opp. 21.

- ³⁷ *Typo*, 3 (1889): 94 etc.
- ³⁸ *Typo*, 6 (September, 1892): 72.
- ³⁹ *Typo*, 3 (January 1889): opp. 21, verso; etc.
- ⁴⁰ *Typo*, 5 (January 1891): opp. 1.
- ⁴¹ A.A. Smith, *Printing in Canterbury: A History of Newspapers and Printing Houses of the Province From the Earliest Times* (Christchurch: Christchurch Club of Printing House Craftsmen, 1953), 26.
- ⁴² *Ibid.*, 23-24.
- ⁴³ *The Canterbury Times*, January 10, 1895, 13; and Guy H. Scholefield, *Newspapers in New Zealand* (Wellington: A.H. & A.W. Reed, 1958), 212-213.
- ⁴⁴ New Zealand Exhibition, *Reports and Awards of the Jurors* (Dunedin: Mills, Dick for the Jurors, 1866), 237. E.M. & D.G. Ellis, *Early Prints of New Zealand, 1642-1875* (Christchurch: Avon Fine Prints, 1978), 173. States that Ward and Reeves won an Honorary Certificate for their colour printing.
- ⁴⁵ New Zealand Exhibition, *Reports and Awards of the Jurors*, 237.
- ⁴⁶ Alexander Turnbull Library, *Biographies Index on Microfiche* (Wellington: Alexander Turnbull Library, 1995), under Ward, Crosbie [1832-1867].
- ⁴⁷ Guy H. Scholefield, *Newspapers in New Zealand*, 213.
- ⁴⁸ New Zealand Exhibition, *Reports and Awards of the Jurors*, 514.
- ⁴⁹ *Ibid.*, 237, footnote.
- ⁵⁰ Joan Kerr, ed., *Dictionary of Australian Artists: Painters, Photographers and Engravers to 1870* (Melbourne: Oxford University Press, 1992), entry by Thomas Darragh, 302.
- ⁵¹ New Zealand Exhibition, *Reports and Awards of the Jurors*, 237.
- ⁵² Joan Kerr, ed., *Dictionary of Australian Artists*, 302.
- ⁵³ Smith, *Printing in Canterbury*, 3.
- ⁵⁴ Ellises, *Early Prints of New Zealand, 1642-1875*, 173.
- ⁵⁵ *Ibid.*, 173-177.
- ⁵⁶ J.E. Traue, *New Zealand Studies: A Guide to Bibliographic Resources* (Wellington, Victoria University Press, 1985), 10.
- ⁵⁷ *The Weekly Press*, Jubilee Number (1900), 30.
- ⁵⁸ *The Cyclopaedia*, 'Canterbury Provincial District', 3, 19.
- ⁵⁹ *Ibid.*, 54.
- ⁶⁰ *Ibid.*, 53.
- ⁶¹ John McIndoe, 'A Publisher in New Zealand', unpublished address to the Otago Branch, NZLA, n.d., 3-5. Held: University of Otago, Hocken Library, Reference: Misc-MS-0031
- ⁶² New Zealand Industrial Exhibition, *The Official Record* (Wellington: The Government Printer, 1885), 93.
- ⁶³ Smith, *Printing in Canterbury*, 47.
- ⁶⁴ *Dictionary of New Zealand Biography*, 1, 1769-1869 (Wellington: Allen & Unwin & Department of Internal Affairs); 2, 1870-1900 (Wellington: Bridget Williams Books & Department of Internal Affairs); 3, 1901-1920 (Auckland: Auckland University Press & Wellington: Department of Internal Affairs, 1990-), 3, 560.
- ⁶⁵ Smith, *Printing in Canterbury*, 48.
- ⁶⁶ *The Cyclopaedia*, 'Canterbury Provincial District', 3, 339.
- ⁶⁷ *Ibid.*, 339.
- ⁶⁸ *Ibid.*, 340.
- ⁶⁹ Smith, *Printing in Canterbury*, 31.
- ⁷⁰ Guy M Robinson, Robert J. Loughran and Paul J. Tranter, *Australia and New Zealand: Economy, Society and Environment* (London: Arnold, 2000), 106.
- ⁷¹ New Zealand Exhibition, *Reports and Awards of the Jurors*, 157-159.
- ⁷² John Gregory and R.V.S. Perry, 'History of Otago Printing 1849-1937' (Dunedin: unpublished manuscript, 1957), chap. 2, 1. Held: Hocken Library, Misc. MS-86a+b.
- ⁷³ Gregory and Perry, 'History of Otago Printing 1849-1937', chap. 5, pt. 2, 2.
- ⁷⁴ *Ibid.*, chap. 2, 2.
- ⁷⁵ *Ibid.*, chap. 4.
- ⁷⁶ *Invicta News*, 1 no.2 (1945): 20.
- ⁷⁷ Coulls Somerville Wilkie Ltd., *A Century of Achievement* (Dunedin: 1948), [1-4].
- ⁷⁸ Gregory and Perry, 'History of Otago Printing 1849-1937', chap. 4, 7.
- ⁷⁹ *Typo*, 3 (August 1889): 100.
- ⁸⁰ *Invicta News*, 1 no.2 (1945): 20-21.
- ⁸¹ James MacIndoe, *A Sketch of Otago* (Dunedin: R.T. Wheeler, 1878), 52.
- ⁸² *Colonial Printers' Register* (Dunedin: G. Griffin, 1879-1880), July 21, 1880, 174.

- ⁸³ Ibid.
- ⁸⁴ *Griffin's Colonial Printers' Register*, (Dunedin: G. Griffin, 1880-1881), November 16, 1880, 20.
- ⁸⁵ *Invicta News*, 1 no.5 (1947): 66-67.
- ⁸⁶ Ibid., 67.
- ⁸⁷ Gregory and Perry, 'History of Otago Printing 1849-1937', chap. 5, pt.1, 4.
- ⁸⁸ *Typo*, 1 (August 1887): 69.
- ⁸⁹ McKay, ed., *A History of Printing in New Zealand 1830-1940*, 124.
- ⁹⁰ Ibid., McKay, ed., 125.
- ⁹¹ *Invicta News*, 1 no.5 (1947): 78.
- ⁹² *Griffin's Colonial Printers' Register*, 2 no.8 (May 1881): 114.
- ⁹³ *Invicta News*, 1 no.5 (1947): 71-72.
- ⁹⁴ Gregory and Perry, 'History of Otago Printing 1849-1937', chap. 5, pt. 3, 6.
- ⁹⁵ *Invicta News*, 1 no.4 (1947): 53.
- ⁹⁶ Ibid., 51.
- ⁹⁷ Gregory and Perry, 'History of Otago Printing 1849-1937', chap. 5, pt. 3-4.
- ⁹⁸ *Invicta News*, 1 no.4 (1947): 52.
- ⁹⁹ Gregory and Perry, 'History of Otago Printing 1849-1937', chap. 5, pt. 1, 7.
- ¹⁰⁰ *The Cyclopaedia*, 2, 406.
- ¹⁰¹ Ibid., 2, 267.
- ¹⁰² *The Auckland Weekly News*, June 26, 1897, 11.
- ¹⁰³ Ibid.
- ¹⁰⁴ Ibid.
- ¹⁰⁵ Ibid.
- ¹⁰⁶ Ibid.
- ¹⁰⁷ Ibid.
- ¹⁰⁸ Ibid.
- ¹⁰⁹ Ibid.
- ¹¹⁰ Ibid., 10.
- ¹¹¹ Ibid., 12.
- ¹¹² Ibid.
- ¹¹³ Ibid.
- ¹¹⁴ Ibid.
- ¹¹⁵ Ibid.
- ¹¹⁶ Ibid.
- ¹¹⁷ Ibid., 11.
- ¹¹⁸ Ibid.
- ¹¹⁹ Ibid., 54.
- ¹²⁰ Ibid., 14.
- ¹²¹ *The Penrose Annual*, 11 (1905/06): opp. 100.
- ¹²² *The Cyclopaedia*, 2, 271; 125. Note: This is also the date given by R.A. McKay, although the 1956 Auckland Public Library publication *Printed in Auckland* states that it was 1875.
- ¹²³ McKay, ed., 'Men of the Industry Past and Present', in *A History of Printing in New Zealand 1830-1940*, 231.
- ¹²⁴ Ibid., 229-233.
- ¹²⁵ Ibid., 230.
- ¹²⁶ Ibid., 232.
- ¹²⁷ *The Cyclopaedia*, 2, 125.
- ¹²⁸ McKay, ed., *A History of Printing in New Zealand 1830-1940*, 232.
- ¹²⁹ Douglas Pike et al., *Australian Dictionary of Biography* ([Melbourne]: Melbourne University Press, [1966-1996]), 123.
- ¹³⁰ *The Cyclopaedia*, 1, pt.1, 725.
- ¹³¹ Kerr, ed., *Dictionary of Australian Artists, Painters, Photographers and Engravers to 1870*, 79.
- ¹³² Ibid., 80.
- ¹³³ *The Dictionary of New Zealand Biography*, 49.
- ¹³⁴ John Muir, 'Headpieces & Fairytales: Wellington's Lyon and Blair 1874-1894', unpublished bibliography (Victoria University of Wellington, 1998), 34.
- ¹³⁵ Alexander Turnbull Library, Tapuhi [database online], record no. 87-182.
- ¹³⁶ *The Cyclopaedia*, 1 pt.1, 726.
- ¹³⁷ *The Dictionary of New Zealand Biography*, 2, 101.

- ¹³⁸ New Zealand Industrial Exhibition, *The Official Record*, 92 and 94.
- ¹³⁹ *Typo*, 3 (May 1889): 46.
- ¹⁴⁰ Alexander Turnbull Library, Tapuhi [database online], record no. Eph-B-People-Munt-1891.
- ¹⁴¹ F. Bruce Sampson, *Early New Zealand Botanical Art* (Auckland: Reed/Methuen, 1985), 93.
- ¹⁴² *The Dictionary of New Zealand Biography*, 2, 49.
- ¹⁴³ *The Cyclopaedia*, 1, pt.1, 725.
- ¹⁴⁴ *The Dictionary of New Zealand Biography*, 2, 49.
- ¹⁴⁵ *The Cyclopaedia*, 1, pt.1, 725.
- ¹⁴⁶ Marcel Stanley, *Alfred Ernest Cousins, Postage Stamp Die Engraver, Die Sinker, Medallist, Copper and Brass Plate Engraver: An Illustrated Biography* (Wellington: Whitcoulls, 1980), 1.
- ¹⁴⁷ *Ibid.*
- ¹⁴⁸ *Ibid.*, [2].
- ¹⁴⁹ John Muir, 'Headpieces & Fairytales', vii-viii.
- ¹⁵⁰ Alexander Turnbull Library, Tapuhi [database online], under name, Lyon & Blair Ltd.
- ¹⁵¹ John Muir, *Headpieces & Fairytales*, iii.
- ¹⁵² *Ibid.*, 40.
- ¹⁵³ New Zealand Industrial Exhibition, *The Official Record*, 93.
- ¹⁵⁴ *Typo*, 2 (February 1888): 10.
- ¹⁵⁵ *Griffin's Colonial Printers' Register*, 2 no.5 (February 1881): 15.
- ¹⁵⁶ *Ibid.*, 76.
- ¹⁵⁷ *Griffin's Colonial Printers' Register*, 2 no.8 (May 1881): 115.
- ¹⁵⁸ *The New Zealand Press News and Typographical Circular*, no.16 (June 1877): 1.
- ¹⁵⁹ *The Evening Post Jubilee Souvenir*, 23rd January, 1890, [1].
- ¹⁶⁰ W.A. Glue, *History of the Government Printing Office* (Wellington: Government Printer, 1966), 35.
- ¹⁶¹ *Ibid.*, 83.
- ¹⁶² McKay, ed., *A History of Printing in New Zealand 1830-1940*, 137.
- ¹⁶³ Glue, *History of the Government Printing Office*, 31.
- ¹⁶⁴ *Ibid.*, 61-62.
- ¹⁶⁵ *The Transactions and Proceedings of the New Zealand Institute*, 1 (1868): imprint.
- ¹⁶⁶ J.R.H. Andrews, *The Southern Ark: Zoological Discovery in New Zealand 1769-1900* (Auckland: Century Hutchinson, 1986), 172.
- ¹⁶⁷ W.A. Glue, *History of the Government Printing Office*, 84.
- ¹⁶⁸ Sampson, *Early New Zealand Botanical Art*, 88.
- ¹⁶⁹ Andrews, *The Southern Ark: Zoological Discovery in New Zealand 1769-1900*, 170.
- ¹⁷⁰ Glue, *History of the Government Printing Office*, 84.
- ¹⁷¹ *Ibid.*
- ¹⁷² At this time the printing for the *Transactions* was being outsourced to Lyon & Blair, but from 1888 printing for this publication was being accomplished by the Government Printer.
- ¹⁷³ New Zealand Industrial Exhibition, *The Official Record* 1885, 92.
- ¹⁷⁴ *Catalogue of New Zealand Exhibits. Colonial and Indian Exhibition, London 1886* (London: William Clowes & Sons Ltd., 1886), 52.
- ¹⁷⁵ *Typo*, 3 (April 1889): 38.
- ¹⁷⁶ Glue, *History of the Government Printing Office*, 86.
- ¹⁷⁷ McKay, ed., *A History of Printing in New Zealand 1830-1940*, 139.
- ¹⁷⁸ *Typo*, 4 (August 1890): 93.
- ¹⁷⁹ *Typo*, 4 (October 1890): 122.
- ¹⁸⁰ National Archives Head Office, Wellington, Government Printing Office, series 4, 'Work Ledger', items noted from pages 121-693.
- ¹⁸¹ National Archives Head Office, Wellington, Government Printing Office, series 4, 'Trade Ledger', page 71.
- ¹⁸² *The Penrose Annual*, 15 (1909/10), foll. 76.
- ¹⁸³ D.F. McKenzie, 'Robert Coupland Harding on Design in Typography', in *An Index of Civilisation: Studies of Printing and Publishing History in Honour of Keith Maslen*, ed. R. Harvey, W. Kirsop & B.J. McMullin (Clayton, Vic: Centre for Bibliographical and Textual Studies, Monash University, 1993), 192.
- ¹⁸⁴ Roderick Cave and K.A. Coleridge, 'For Gospel and Wool Trade: Early Printing in New Zealand', in *Printing History*, 13 (1985): 27.
- ¹⁸⁵ *The Cyclopaedia*, 1, pt.1, 733.
- ¹⁸⁶ *Typo*, 6 (October 1892): 84.
- ¹⁸⁷ *Typo*, 7 (October 1893).
- ¹⁸⁸ *Typo*, 2 (1888): 32.

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- ¹⁸⁹ *Typo*, 1 no.1 (1887): 1.
- ¹⁹⁰ *Typo*, 4 (May 1890): 59.
- ¹⁹¹ Alexander Turnbull Library, Manuscripts collection, 'Robert Coupland Harding – Correspondence', Reference, MS-Papers-1267.
- ¹⁹² *Ibid.*
- ¹⁹³ *Dictionary of New Zealand Biography*, 2, 195.
- ¹⁹⁴ *The New Zealand Mail*, Christmas Number, 1896, 54.
- ¹⁹⁵ Griffith, Harvey and Maslen, eds., *Book & Print in New Zealand*, 54.
- ¹⁹⁶ *The New Zealand Mail*, Christmas Number, 1896, 54.
- ¹⁹⁷ *The Cyclopaedia*, 1, pt.1, 733.
- ¹⁹⁸ *Ibid.*
- ¹⁹⁹ *The Dictionary of New Zealand Biography*, 3, 300.
- ²⁰⁰ *The Cyclopaedia*, 1, pt.1, 734.
- ²⁰¹ Ellises, *Early Prints of New Zealand, 1642-1875*, 96-97.
- ²⁰² *The New Zealand Mail* Christmas Number, 1896, 54.
- ²⁰³ *Ibid.*
- ²⁰⁴ Griffith, Harvey and Maslen, *Book & Print in New Zealand*, 63.
- ²⁰⁵ *The Cyclopaedia*, 1, pt.1, 736.
- ²⁰⁶ *Ibid.*
- ²⁰⁷ *Ibid.*
- ²⁰⁸ New Zealand Industrial Exhibition, *The Official Record*, 92.
- ²⁰⁹ *The Cyclopaedia*, 1, pt.1, 735.
- ²¹⁰ *The Weekly Press*, September 29, 1897.
- ²¹¹ *The Cyclopaedia*, 1, pt.2, 1193.
- ²¹² Arthur P. Bates, 'Newspapers in Wanganui', in *The Historical Record: Journal of the Whanganui Historical Society Inc.* [Wanganui, N.Z. : The Society], 7 (May, 1976): 18.
- ²¹³ *Wanganui Coronation Souvenir 1911* (Wanganui: The Wanganui Chronicle Company, 1911), entry under H.I. Jones & Son. Ltd.
- ²¹⁴ *Wanganui Herald*, 28th August, 1880, 4.
- ²¹⁵ *Wanganui Coronation Souvenir*, 1911, entry under H.I. Jones & Son. Ltd.
- ²¹⁶ Alexander Turnbull Library, Ephemera Collection, item B-MUSIC-1881. (See also chapter 11.)

SECTION IV

Colour Printing in New Zealand: The First Fifty Years

CHAPTER 8

A. D. WILLIS OF WANGANUI: A CASE STUDY

Introduction

In the latter part of the nineteenth century New Zealand printers had increasingly seen the provision of printed colour as a business opportunity, and the potential that especially chromolithographic colour held to enhance particularly jobbing items such as posters programmes and booklets. The Wanganui firm of Archibald Dudingston Willis¹, usually known as A.D. Willis & Co., was such a place of enterprise, especially in the department of job-printing, and became well-known particularly for the production of colour printed Christmas cards as well as for playing cards and view postcards. At least from 1883 A.D. Willis had published chromolithographed Christmas cards adorned with both scenic views and some of the unique flora of New Zealand. Willis has been credited with printing the first coloured townscape known to have been produced in New Zealand, also in 1883.² In addition, he printed and published prints, maps and books, some in full colour. A.D. Willis was in business as a colour printer in Wanganui by the eighteen eighties, having established the firm, one that was still operating until well after the end of the study period, in 1872.

Recourse to the A.D. Willis archive held at Whanganui Regional Museum reveals that unfortunately complete business records of this firm from the period do not appear to have survived. However, examples of the colour printing executed at the firm and other documents concerning the business are held. Further artifacts are preserved in the Beaglehole Room at Victoria University of Wellington and in the Alexander Turnbull Library in Wellington, together with runs of the early Wanganui newspapers which can be used to gather primary evidence to correlate with the evidence of the artifacts and that from other secondary sources.

Wanganui in the Late Nineteenth Century

In socio-economic terms, Wanganui, a garrison town during the Maori Wars, underwent a transformation over the decades of the 1870s and 1880s, the period in which A.D. Willis established and built his business. Until roads and railways were built, for trading purposes Wanganui was dependent on its river port. As mentioned in chapter 3, even after such alternate internal infrastructure was in place, refrigeration had begun to allow the export of

frozen meat and this had meant that shipping traffic to Britain had not only continued, but from the mid eighties had increased. The first shipment of frozen meat had departed from Port Chalmers in Dunedin in 1882, and the next year, in January 1883, a direct line of steam-communication between England and New Zealand had been inaugurated by the New Zealand Shipping Company.³ A direct route to Britain was a distinct advantage to Wanganui interests, as the ability to export meat, dairy produce and wool from the local hinterland brought business to the town. However, at the time, as steamer traffic increased, Wellington was increasing its trade with England. The *New Zealand Mail* reported that:

In 1882, seventeen years ago, not one steamer direct from England entered Wellington Harbour; in 1898, twenty-six direct liners came here, aggregating 87,530 tons.⁴

To ensure that Wanganui retained its thriving port, Wanganui merchants had moved to counter the siphoning of business to Wellington:

In the newly formed Tyser Shipping Company they found a line free of any cartel agreements, and were able to negotiate with it for direct shipments from Wanganui to London. In 1890, the Wanganui folk pledged themselves to ship all their wool and other export produce by the Tyser line, which in turn agreed to keep its freight rates the same as those ruling in Wellington and to bear the cost of lightering the cargoes to its steamers, anchored outside the Wanganui bar.⁵

By 1890 the advent of first the road access to Wellington and then the railway network had been influential factors in Wanganui's growth from a small town that was only linked to other centres by coastal shipping, to an important railway node on the new North-South Main Trunk. This was a development that eventually made the town much less dependent on its river-port for internal communications. The historian Rollo Arnold has pointed out that the New Zealand population expansion of the eighteen seventies had seen Wanganui almost double its European population, with the main surge of growth beginning around 1874, a period during which Wanganui had been cast as:

a staging post in the distribution of immigrants flooding in under the Vogel scheme. From the immigrant ships arriving in Wellington Harbour parties were transferred to little coastal steamers and brought to Wanganui, and from the barracks here they set out on the last stage of their great journey to their new homes in Wanganui's hinterland.⁶

Arnold has stated that as the population grew, it was over these two decades that Wanganui became increasingly sophisticated as a commercial, professional, information and communications centre for its hinterland. In addition, from its early days, Wanganui had been recognised as an educational centre. This was the town to which A.D. Willis came in 1864, and in which he ultimately chose to found his printing and publishing business.

A.D. Willis – Biography

Archibald Dudingston Willis arrived in New Zealand from England at the age of fifteen, but it was not until after a period of working in the printing industry in various parts of the country that he settled in Wanganui and built up his own printing firm. Clearly he preferred

a working life in which he was more able to control his own affairs to the more capricious life of a gold-digger, an occupation which he had tried, but only for six months. Although at first, Willis' itinerant work as a printer had been in the newspaper business and at one time he had helped start the *Hawkes Bay Herald*, eventually he had settled in Wanganui, where at first he went into partnership with John Ballance to produce the *Wanganui Herald*, before setting up as a printer on his own account in premises in Victoria Avenue.

The son of an English mother, Matilda Wills, and a Scottish father, John Willis, Archibald was born in London in 1842.⁷ At the age of twelve he went to work to learn the printer's trade.⁸ His father had died soon after he was born, but it was after the death of his mother, when Archibald was still a teenager, that he embarked on the *Dinapore* for New Zealand. By working his passage over, Archibald Willis arrived in Auckland in 1857 at the age of fifteen, without money, but with the twin assets of some experience working in the printing trade and an astute mind.

For the first years, he moved around and worked in many parts of New Zealand, and it was while he was working in Wellington in the sixties that Archibald Willis had met Mary Dixon. In 1865, the year that Ward & Reeves of Christchurch were awarded a medal for their early chromolithography, the couple were married in Wellington, but made their family home in Wanganui, as in 1864 Willis had accepted a job offered by J.U. Taylor at the *Wanganui Chronicle*.⁹ At that time the unrest concerning the Maori population had begun in the area, and Willis was required in the Wanganui Regiment of the Militia. The military records of the Wanganui-Rangitikei Districts list him as a private between 1868 and 1869 and in 1870 as a Wanganui Rifle Volunteer, the company in which he rose to the rank of captain.¹⁰

In addition to raising a large family of eight sons and five daughters¹¹, Archibald Willis soon began to exert an influence in many and diverse public spheres, as well as in his private business as a printer. Willis' public roles included service on the Wanganui Borough Council, the Harbour Board (for which he was Chairman between 1887 and 1904), the School Committee and the Public Library Committee. He was a member of the Chamber of Commerce, a Justice of the Peace, a Wanganui Public Museum Trustee, a Racecourse Trustee and Chairman of the Harmonic Society.¹² Willis' service in such capacities was far from passive, and in some instances, his beneficial influence was far-reaching. For instance, during his time on the Borough Council, in conjunction with Mr J.G. Sharpe, Willis was responsible for having the town streets planted with trees, and while on the Harbour Board

he made a contribution that vitally affected trade between Wanganui and the outside world.

In 1896 the *New Zealand Mail* reported that Mr Willis

has done excellent service to the town, and it was very largely due to his untiring efforts that grants were got from the Government to effect the improvement of the navigation of the Wanganui River, and this opened up the fertile country in the interior.¹³

The great importance of the river port facilities to the economic well-being of the town hinged on the efficiency with which goods could be received and dispatched. In turn this affected the viability of businesses, including Willis' own, especially before the development of better rail and road transport in the eighties. It was reported in the *Wanganui Herald* for 4th January 1889 that at the Harbour Board meeting Willis was to bring forward a proposal in connection with the breakwater, which was thought to be "of considerable import."¹⁴

A.D. Willis' breadth of experience in public life eventually culminated in 1893 in his being elected to Parliament to represent Wanganui in the New Zealand House of Representatives, following the death of his friend and former business partner John Ballance, who as a politician had risen to become Premier. Before standing for election himself, Willis was for many years said to have been the late Premier's right hand man in local political matters.¹⁵ Willis' business card, which survives in the Whanganui Regional Museum archives, lists the various posts he held, and the years of his parliamentary terms. After election by a large majority in 1893 to an initial term of office, Willis had been defeated by G. Carson in 1896, but was re-elected in 1899, again being defeated in 1905 by J.T. Hogan.¹⁶ Besides his many other interests, Willis enjoyed recreational horticulture and the game of bowls to the end of his life. He had been one of the original members of the Horticultural Society. In August 1908, at the age of sixty-six, Archibald Willis died in Gisborne while travelling, after being transferred to Gisborne hospital after he was taken ill with an acute throat infection on board a ship bound for Auckland from Wellington. An obituary appeared in the *Wanganui Herald* on the 28th August of that year, explaining that after an operation ashore, Archibald Willis had appeared to be recovering, but that he had relapsed and died "about 3.40 this afternoon."¹⁷ His wife Mary and two of his sons had arrived from Wanganui about a week before his death. After the private Wanganui funeral, Mrs. Willis remained at their large Wanganui East property, Te Mawhai, until her death in 1926. With its "sweeping grounds [that] led down to a pool and fountain on the river flats" Te Mawhai had been home to Archibald and Mary since the eighteen nineties. Archibald Willis is buried at Wanganui.¹⁸

In 1907, the year before he died, A.D. Willis had been described in a publication entitled *Familiar Faces* as the architect of his own good fortunes, but also as a man who always had

been ready to help the less fortunate.¹⁹ It is a striking fact that biographical sources are unanimous in showing A.D. Willis in a positive light. In his obituary it was stated that "in his private character, Mr Willis was liked by all."²⁰ An astute businessman, Willis was ready to innovate and to improve, and to help others to do so, sometimes offering an incentive. For example, in August 1880 he had offered school prizes for the best three essays on coal, an important commodity in the nineteenth century industrial and steamship era. His reason for the competition he said was "not so much that the best essays should win a prize, as that the efforts of the losers should cause them to gain a little more knowledge which would help them through life."²¹ At the same time Willis was in touch with the socio-economic pulse through his interest in how people were thinking, both in his immediate circles of contact, and in the wider community. Such knowledge was valuable not only to a political career, but also to business planning, and was a distinct ingredient in Willis' business acumen. That Willis held public opinion in high regard was evident, for instance, during court proceedings concerning the Wanganui Election Petition that he brought in 1882 together with John Ballance and Stewart Manson against W.H. Watt. At one point in the hearing Willis stated that he considered that "the final Court of Appeal always is – Public Opinion."²²

Also together with his friend John Ballance, who was "a committed secularist," A.D. Willis had founded the Wanganui Branch of the Freethought Association in 1883,²³ and was its treasurer in 1884.²⁴ One of the aims of this organisation, which at the time was growing in influence in New Zealand and overseas, was stated in its journal, the *Freethought Review*, published by Willis between 1883 and 1885: "we seek truth and we afford the means to obtain it."²⁵ Archibald Willis was evidently open to new ideas, and was not afraid to explore them, and this attitude was reflected not only in his business pursuits but also in his sphere of public influence. For example, as a founding director of the Wanganui River Steam Navigation Company "which operated the *Tuhua* in 1886",²⁶ Willis is said to have played "an important role in pioneering the river boat era on the Wanganui River."²⁷ Such development of the river transport was particularly beneficial to the town in the late nineteenth century, partly because of the resulting new route to Auckland, but importantly, because it was also beginning to put Wanganui on the tourist map. As a centre of tourism, the town was being promoted as "The Capital of New Zealand's Rhineland."²⁸ In the late nineteenth century, the tourist industry was a growing source of revenue to any New Zealand town that could tap its economic potential.

A.D. Willis the Printer: Training and Career Path

In addition to strengths displayed in the public arena, Archibald Willis possessed a shrewd entrepreneurial capacity that became evident especially in his private printing and publishing business. An 1897 entry appearing in the *Cyclopedia of New Zealand* concerning Willis, described the businessman. By then A.D. Willis of Victoria Avenue was "Bookseller and Stationer, News-agent, General Printer, Chromo-lithographer, Manufacturing Stationer, Bookbinder, and Publisher."²⁹ Archibald Willis had been fortunate to have trained from the age of twelve at the well-known London firm of lithographic printers, Eyre and Spottiswoode,³⁰ Printers to the Queen, an establishment that had been founded in 1770, initially as Eyre & Strahan. That this had been a forward-looking firm is indicated by the fact that the first power Hopkinson & Cope double-platen machine was built for Spottiswoode in 1830.³¹ Willis had only been employed there for three years, but it is obvious from his later work that this firm had kindled his interest in the lithographic processes. Unfortunately it appears that at least some of the Eyre and Spottiswoode business records were lost in the blitz, probably precluding any further information concerning the connection of A.D. Willis with that firm being accessible.³² Although chromolithography had been at its height in England at the time Willis was with Eyre and Spottiswoode just after the Great Exhibition in the eighteen fifties, according to Geoffrey Wakeman and Gavin Bridson, colour lithographic work started to appear from that firm only in the eighties.³³ In this decade they began to produce colour printed books such as the title *The Jackdaw of Rheims*, illustrated by E.M. Jessop, that was "printed in tints, with a lithographed text."³⁴

It is therefore unlikely that Willis had received training in colour lithography before leaving England, although it was said that in the years he spent at the firm he had "learned a good part of the printer's trade."³⁵ It was not until the age of thirty that he had decided to go out on his own in New Zealand, when in 1872 he acquired the Wanganui firm of W. Hutchison. It was as a printer and manufacturing stationer that he first went into business, adding the other interests of bookselling and publishing at a later date. In 1940, H.J. Tubbs commented on A.D. Willis, the firm:

Of the [New Zealand] houses who combined retail and wholesale business, the well-known firm of A.D. Willis Ltd., Wanganui, is a good example. It was active in the wholesale field sixty years ago, and is still well known for playing cards, the manufacture of which it pioneered. The enterprising founder of this company is still remembered both in business and politics. He was an outstanding personality in both spheres.³⁶

In the intervening years between arrival in New Zealand in August 1857 and the establishment of the Victoria Avenue business in 1872, Willis had travelled throughout the country, living and working in many towns. His initial job had been at the *Southern Cross* newspaper in Auckland, after which he had moved to Hawke's Bay, where, with James

Wood and Sir Donald McLean, he had helped to found the *Hawke's Bay Herald*, the first issue of which had come out on 24th September 1857.³⁷ The move is explained in *The Dictionary of New Zealand Biography* (Literature Review: 31.)

In Auckland Willis met James Wood, sub-editor of the *Southern Cross* newspaper. Having tested his capabilities, Wood persuaded the young printer to accompany him to Napier, where they started the *Hawke's Bay Herald*.³⁸

That paper flourished, but Willis then moved on to Wellington where he continued to work in the letterpress environment as a compositor on the *New Zealand Advertiser* until he took time out to prospect for gold at the famous Gabriel's Gully in the Otago hinterland when the rush broke out. After six months, with "dame fortune proving none too kind,"³⁹ Willis returned to work in the printing business. The following period was spent at various newspaper firms, in succession in Dunedin at Julius Vogel's *Otago Daily Times*, back in Wellington again at the *Advertiser*, and then at the Christchurch *Press*. By this time he had worked in all the major centres, as well as in Napier, the town where he had first showed his leanings towards going into business on his own account. During his time in New Zealand Willis had started as a journeyman, and by working his way up, eventually had become a Master Printer,⁴⁰ reportedly by 1863 being the holder of the first Typographical Society card issued in New Zealand. This has been said to have been the first society card of any trade in the colony.⁴¹

Willis' initial intent in 1864 had been to establish his own Wanganui newspaper, but after he had bought suitable plant the decision was diverted: he disposed of the plant and instead took an offered position as foreman printer on the already established *Wanganui Chronicle*.⁴² Under the heading 'Printers' in the section 'Wanganui Trades and Professional Directory' an 1866 *Wanganui Alphabetical Directory* lists Willis as being at the Chronicle Office.⁴³ It was here that Archibald Willis met John Ballance, who had arrived from Australia in 1865 and initially had opened a jeweller's shop. In the late sixties, after Ballance had founded the *Wanganui Herald* in June 1867, a penny evening paper, Willis joined the fledgling business as a partner after Ballance had "gathered a small amount of capital and credit, [and had] purchased from John Martin the plant of a newspaper which had closed down."⁴⁴ After the dissolution of an early brief partnership which had proved unsuitable, Ballance had decided that what he needed was a practical printer as a partner, and Archibald Willis filled that role admirably. Scholefield records however, that after the period of the Maori Wars "the *Herald* had lost a good deal of money, and Ballance paid out his partner, thereafter running the paper himself."⁴⁵ This then, was probably the source of the capital that A.D. Willis used to establish his own Wanganui printing firm, which by

1907, the year before he died, was described as being “a large and prosperous firm of wholesale stationers, printers, paper merchants, and booksellers.”⁴⁶

Nature of the Business

The Firm of A.D. Willis

Over the years the long-standing firm of A.D. Willis built a very good reputation, and was known from the eighteen eighties especially for chromolithographic printing. Archibald Willis Ltd. had been the recipient of a first prize for this class of colour printing at the 1885 New Zealand Industrial Exhibition. The *Official Record* from this event states that among the exhibits for Class 17.—Apparatus and Processes Used in Papermaking, Dyeing, Printing, Stereotyping, Engraving, and Lithography:

Archibald D. Willis, Wanganui, has some excellent samples of chromo-lithographed Christmas cards, ball programmes, playing cards, views of towns, portraits, &c.⁴⁷

Under the section ‘Awards’ appears: “A.D. Willis, Wanganui : First prize for specimens of chromo-lithography.”⁴⁸ The following year, the catalogue from the Colonial and Indian Exhibition in London, under Group I - Works of Art; Class V - Engravings and Lithographs, lists “Willis, Archibald D., Wanganui” as showing “specimens of Chromo-lithography”. In February 1889, R. C. Harding had noted in *Typo* that at the Melbourne exhibition A.D. Willis had received a second class award for cards. That high standards were maintained by the firm is indicated from the account of Willis’ Wanganui business published in the *New Zealand Mail* Christmas number for 1896. There it was stated that by then the Wanganui shop was “one of the finest of its kind, not only in this province but in the whole of the colony.”⁴⁹

Since chromolithographic printing was expensive, a business that treated colour printing as a specialty was more likely to succeed in achieving a satisfactory financial footing. Other essentials were the possession of sufficient capital to buy suitable plant, and the employment of a chromolithographer and printers with the necessary skills. That Willis himself had particular skills in the area of finance is indicated by the fact that he had taken on the position of chairman of the Wanganui Harbour Board reportedly during a financially daunting time when nobody else would accept the position, and had been able to turn around a situation of near bankruptcy to one of lasting financial health.⁵⁰ The combination of business and printing skill possessed by the proprietor contributed to the growth of this New Zealand firm, one which had evolved from two relatively small concerns, the printing office that had been established by Willis, and the bookselling and stationery business bought from Hutchison. All branches of the business were kept and expanded. By 1880, an advertisement in the *Wanganui Herald* characterised the firm’s business: “Every description

of work undertaken, pertaining to the Printing Business, including Letterpress, Lithographic and Copper-plate Printing, Book-binding and Paper Ruling. Which will be undertaken at very low rates, and will be executed with neatness and despatch.”⁵¹ Just before Christmas 1883, reference was made in an advertisement in the *Wanganui Chronicle* to a large stock of well-selected books that A.D. Willis had “ordered expressly from London for this season, suitable for all ages.” A miscellany of other imported items were on sale, including scrap-books and fern albums, as well as such things as fireworks and “appliances necessary for keeping bees.”⁵²

Capital, Premises and Wider Business

As mentioned, the private capital retrieved from his partnership with Ballance was most likely that used by A.D. Willis to found his own firm in 1872. Around the same time, in the early seventies, the Government had provided considerable capital to improve infrastructure in the Lower North Island, and this contributed to a phase of growth for Wanganui. Thus, in spite of the general economic downturn prevailing in the country as a whole, it was a fortunate time to have gone into business in Wanganui, particularly in the service sector. A.D. Willis took out an initial lease⁵³ for premises in Victoria Avenue, on Town Section no. 57, for a period of 7 years and 4 months from May 1st 1872. The lease itself, Thomas Powell Esqr. to Mr. A.D. Willis was dated “9th July 1872”: the solicitor was M.V. Hodge. It described the frontage to Victoria Avenue as measuring 25 feet and extending backwards 16 feet eight inches, comprising two front ground-floor rooms. Stating that A.D. Willis and Thomas Powell were to jointly insure the premises against fire, the lease also provided for Willis to have “free and uninterrupted ingress, regress, and egress...by the north-west door of the premises to the adjoining yard for the purpose of washing type and other materials used in his trade as a Printer.” Willis was to “pay all rates, taxes, charges, assessments and impositions.” If destroyed by fire, the insurance would be used to replace the premises; if the rent was overdue by 30 days the premises could be repossessed by Powell. The lease had been signed in the presence of George McCaul, the Wanganui Law Clerk. Underlining his orientation to Britain and to the British printing trade where he had received his early training, Willis named his new business the Caxton Printing Works.

In addition to monetary capital with which to establish himself in business, Archibald Willis appeared to possess the capital of “untiring energy and enterprise...[as well as] persistent application,” which were considered to have been main factors in Willis’ overall business success, as reported in *The Cyclopedia*. The same source fulsomely described the premises as they were in 1897:

The fine leasehold premises – situated in the busiest part of Victoria Avenue – comprise a large building of wood and iron, with two splendid show-windows opening to the street, under the handsome verandah which spans the footpath. The shop contains an enormous stock of books, stationery, and office requisites, besides fancy goods of diverse descriptions, many of the articles being displayed in plate glass show-cases of elegant design....Behind the shop and offices the printing and manufacturing departments of the firm are situated.⁵⁴

The business appeared to thrive on all fronts. The stationery business was given a boost because at the time there was a 'Protection' in place and in 1888 tariff changes were advantageous:

One of the results of Protection is that Collins & Son are about to establish in Auckland the manufacture of envelopes and other articles of stationery which have a heavy duty. Under the tariff of last year, Mr. Willis has also extended his manufacturing business in consequence of the protection afforded...⁵⁵

Over the next decade, this part of the business increased, providing staple requisites especially for the Colonial commercial sector and, along with the bookselling arm, would have been likely to have provided steady backbone revenue for the business as a whole. The *Cyclopedia* described this type of bread-and-butter output from A.D. Willis by 1897:

As a manufacturing stationer, Mr. Willis produces a great many account books for banks, insurance and mercantile offices, and everything required in this direction by commercial houses generally. He is the publisher of Blair's Colonial Drawing Books, freehand and geometrical, and many other works, both educational and historical.⁵⁶

In 1904, the *Freelance* had reported that:

Mr. A.D. Willis, the printer-politician of Wanganui, intends taking "a run Home" as soon as the House concludes its present session...he has on several occasions had the enterprise to bring out direct to the colony big shipments of popular books, and he has been well rewarded in his testing of the reading taste of New Zealand's book-lovers.⁵⁷

Although Archibald Willis had elected to operate his business in the Antipodean New Zealand town of Wanganui, his interests were spread throughout the colony and beyond, and by travelling he kept in touch with overseas printing and publishing trends, particularly those in Britain, which was still regarded as 'Home' in the early twentieth century by many New Zealanders.

Staff

By the turn of the twentieth century, the firm of A.D. Willis was said to undertake every kind of plain and fancy jobbing work in addition to paper-ruling, die-sinking, embossing and bookbinding in the Caxton Printing Works. For this range of work, twenty-six skilled staff were employed on a regular basis.⁵⁸ By 1911, near the end of the period under study, and after the death of Archibald Willis, the business was still thriving. Work undertaken in the printery was described as "printing, litho work, bookbinding, rubber-stamp making, [and] blocks for illustration...", while the retail business was said to have "one of the finest stocks of books, stationery, fancy goods, games and novelties in the Dominion" and the news agency which dealt in "papers and periodicals of all kinds" was seen as "very extensive."⁵⁹

The building of a successful printing firm such as this required not only a skilled staff but also one in which morale was high, and it seems that Archibald Willis also had understood this aspect of business management. In 1891, the staff had a tribute to their employer and his wife printed in gold on red silk which read:

To Mr & Mrs A.D. Willis

Wanganui, Sept 25, 1891.

We desire to return our heartiest thanks (for ourselves, and on behalf of our friends who were present) for the Dance given to us on Wednesday evening last, and for the very kind and hospitable manner in which we were entertained on that occasion, both by yourselves and by the members of your family. To Mrs Willis, especially, we feel that we owe a debt of gratitude for the great amount of energy, time, and skill she ungrudgingly bestowed on the preparatory details, to which we consider the Happy Evening spent by everyone present was mainly due. Trusting you will receive this slight memento of our gratefulness as sincerely as it is subscribed, We respectfully remain, C.W. Poynter, F. Percival, Florence Wild, G. Bourne, W. Gouldring, J.D. Quin, T.W. Penn, W.J. Quin, J. Withers, G. Whitcombe, W. Potts, H. McKinnon, A.M. Burrows, W. Whitcombe, W. Wakeley, J. Carrell, S.P. Hooper, T. Valler; Employees of Caxton Buildings.⁶⁰

Such a paragraph may be seen merely as a polite formality, but it also gives insight into relationships within the business, and that the intention of the proprietor was to indicate to his staff their value in ways other than, and beyond, their regular remuneration. It is telling also that Mary Willis, an energetic woman, was behind her husband's more visible roles in business, politics and public life. By providing a listing of the staff, this tribute has also acted as a reliable source, and while the list may not be complete, it does give confirmation that in September 1891 these were some of the people in Willis' employ, including William Potts his chromolithographer, on whose skills the ability of the firm to undertake colour printing was at that time largely dependent. An invitation to the 1891 dance, printed in colour (most likely by William Potts) is preserved at the Whanganui Regional Museum, the text revealing that the venue was to be "the New Premises." (Plate 20.)

Mr. & Mrs. Willis Request the pleasure of Mrs Gower's company at a dance given by them to the employees of the firm, to be held in the New Premises, on Wednesday 23rd September, 1891. Dancing at 8.30 p.m. R.S.V.P.⁶¹

It was most probable that this referred to the firm's premises: it is likely that the new premises had been the result of the recent extension to the business afforded by the increased protection given to such local manufacturing businesses, and the occasion appears to have been a celebration of this milestone.

William Potts

Very little appears to be recorded about William Potts (1859-1947), one of A.D. Willis' most important chromolithographers, other than the fact that he was an English lithographic artist, who had been especially brought out to New Zealand by Willis to undertake that side of the business.⁶² Potts' name appears on many of the surviving chromolithographs that emanated from the firm at least from 1883 onwards. William (Billy) Potts may have arrived around 1881, as postulated by Bruce Sampson,⁶³ but certainly by 1883: it was recorded in an

1883 advertisement that Willis placed in the December 15th issue of the *Wanganui Chronicle* that orders were being taken for a limited edition of a chromolithographic view of the town of Wanganui which was soon to be published and which had the name "W. Potts" at the bottom.

A.D. Willis, Bookseller, Stationer and General Printer, Victoria Avenue, Wanganui has much pleasure in announcing that he will shortly publish, size 24in x 20in, a comprehensive and artistic View of Wanganui, executed in various colours in the highest style of chomo-lithographic art, and suitable for framing. Embracing a view below the Railway Station and thence to Mount Ruapehu. It will be the finest work of its kind yet executed in New Zealand, showing in correct detail most of the principal buildings of Wanganui.

As the number printed is necessarily limited, the publisher has decided to sell to subscribers giving their names before Christmas for five shillings each copy, after which time no copy will be sold for less than seven shillings and sixpence.⁶⁴

It is apparent from the statement under the heading 'Christmas Cards', that Willis' Christmas cards were also on sale by then, as well as some apparently imported from England.

Christmas Cards. On sale a Large Assortment, which will be sold exceptionally cheap, as they were bought at less than English cost price.

A large stock is also on hand of Willis's Celebrated Chromolithographic Christmas Cards, exhibiting views of New Zealand and of some of the principal Trees and Ferns.⁶⁵

In 1886 a reference in the *Wanganui Chronicle* referred to the artistry of these by then well-liked local Christmas cards which had been printed by A.D. Willis, and for which William Potts would have been the chromolithographer, as well as the artist who painted many of the originals from which the chromolithographs were made.⁶⁶ They had obviously caught on.

Mr A.D. Willis, of Wanganui (says the North Otago Times) is known all over New Zealand on account of the beauty and artistic finish of the Christmas cards and other art work executed and published by him. His Christmas cards, too, besides the excellence of their design and execution have the highest recommendation: they have as their subjects New Zealand vegetation, places, incidents and scenery. This gives these cards, in conjunction with the admirable workmanship expended in their production, a very high value as presents and tasteful mementos to be sent by New Zealand colonists to their friends in the other colonies and in Europe.⁶⁷

William Potts, "a quiet retiring bachelor who lived in lodgings and took little part in community affairs"⁶⁸ was listed in Wise's directories as a Wanganui artist between 1884 and 1893. Certainly, I have sighted a print signed by him that is dated 1893.⁶⁹ (See section: Prints) A note that appeared in *Typo* in January 1894 seems to confirm Wise's dates:

Mr William Potts, who has for nine years held the position of artist and head of the lithographic department for Mr. Willis, of Wanganui, has left the establishment...⁷⁰

A watercolour painting of Wellington that is held in the Turnbull Library is thought to have been painted by Potts somewhere between 1900 and 1920.⁷¹ Perhaps William Potts had moved to Wellington? However, it was suggested by R.C. Harding that after he left the employ of A.D. Willis, William Potts intended to leave the colony.⁷²

Plate 20: 'Invitation Card.'

Printed at the firm of A.D. Willis, Wanganui.

By permission of the Whanganui Regional Museum, Archives.

Ref. No.: A.D. Willis Papers.

Mr. & Mrs. Willis

Request the pleasure of

Mrs. Gowers

company at a dance given by them to the employees of the
firm, to be held in the New Premises, on Wednesday, 29th
September, 1891.

Dancing at 8.15 p.m.

W. S. P. 7

In a review that appeared in November 1887, also in *Typo*, concerning the plates executed by Potts for W.M. Maskell's book on scale insects (see below) R.C. Harding referred to Potts' expertise as a colour printer:

The lithographic plates, drawn by the author and executed at Mr. Willis's establishment, reflect the greatest credit on the artist, Mr. Potts. We can offer no criticism as to their correctness as to form and color which we take for granted; but we can appreciate the accurate register.⁷³

From a note in the January 1879 issue of the *New Zealand Press News and Typographical Circular*, it appears that William Potts had not been Willis' first or only lithographer. A Mr. Simms had been the first lithographer at the firm until his departure for Napier, after which Mr. Clarke had arrived from Wellington to take the position at around that time:

Mr. Simms, who has been engaged as lithographer ever since Mr. Willis started that branch of the business, has left under engagement for Napier, Mr Clarke from Wellington, filling his place. Mr. J. Birchall, sen., is jobbing at Willis's...⁷⁴

Benoni White

Benoni White, also a lithographic artist, was associated with the firm of A.D. Willis from around the turn of the century, as surviving items chromolithographed by him and published by Willis date from the first decade of the twentieth century, at least from 1901, although whether he was on the permanent staff or worked free-lance has not been determined. The Whanganui Regional Museum holds a scrapbook containing many samples of his work, but which are from an earlier period he had spent working as a lithographic artist in Ireland, where he had a lithographic studio in Belfast, first in Chichester street and then in Howard street.⁷⁵ On the back of a colour-printed cigar poster (which is on the inside cover of the scrapbook), "The 'Great Two-D' Lighted Ones, Leahy Kelly & Leahy Limited Belfast," is the handwritten "Own design & Litho, B.W." Other scrapbook items (listed as on pages 9 & 10 of the scrap-book) are designated "'Progressives' of Reduced *London News* Supplement." On the verso of one of these appears "Sheet No 2., Lithographic Studio, Benoni White, 7, Chichester Street [crossed out], 14, Howard Street, Belfast – Illustrated *London News* Supplement – 1885. Reduced reproduction for Exhibits of Lithography at Inventions Exhibition, South Kensington."

Also dating from the earlier Irish period is a business card that is pasted on to the back of a Benoni White watercolour painting held in the Whanganui Regional Museum. It states: "Chromo Lithography in Chalk or Stipple. Benoni White, Artist." Other chromolithographed examples in the scrapbook include pictures for three calendars, one of which is dated 1890, a print, four floral cards, six Christmas cards featuring figures, a Crawford's (of Edinburgh) Fairy Queen biscuit box top (Plate 21), a box top entitled

“Royal Irish Linen...Stationery,” a Neale & Wilkinson’s shipping card, a Coopers’ saline box label, a Palmer’s tyre card, and five facsimiles of photographic views. On the chromolithograph for “ropes supplied by the Belfast Ropework Company Limited, Ireland”, the note “7 colour calendar” appears in pencil. These are competent examples of the chromolithographer’s art.

From this evidence it can be seen that Benoni White had worked as a chromolithographic artist in Belfast before coming to New Zealand at least until the eighteen nineties, and from the examples, it can be seen that he had a varied experience in work that was very much consonant with the type of colour printing being undertaken at Willises in Wanganui, a firm that was expanding by the nineties. Perhaps by then Willis was looking for another artist to help cope with the work, or perhaps to replace William Potts, who apparently moved on, as chromolithographic works by him do not seem to have come from Willises after the eighteen nineties. Those from Benoni White appear at least from 1901. During the time that White had been working as a lithographic artist in Belfast, the colour printing firm of Marcus Ward & Co. of Belfast and London were also producing chromolithographic work: by 1874 their Belfast works had employed 900 workers. Geoffrey Wakeman and Gavin Bridson state that this firm had exhibited colour printing at the Great Exhibition, but

despite their start in the fifties, most of Ward’s colour work for book illustration dates from later in the century. Three styles of chromolithography appear to have been used...The firm were prolific producers of coloured illustration in the seventies and eighties, as well as very active in the Christmas card field.⁷⁶

It is a possibility that Benoni White may have trained there, but in any case he would have been familiar with their work. A.D. Willis, also a specialist in chromolithographed Christmas cards, would be expected to have known their colour printing. Marcus Ward & Co. had executed the chromolithographic reproductions for the famous *New Zealand Scenery Chromolithographed after Original Water-color Drawings* by John Gully in 1877, a work that would have been of particular interest to a New Zealand colour printer, and Willis, who had produced such work in New Zealand from the eighties, would have been keenly aware of such a publication and the high standard of colour printing that it represented. The chalk and stipple styles of chromolithography used by the firm matched those in which Benoni White specialised, although Wakeman and Bridson mention that Marcus Ward also used a grainy style for their higher class work.

Plate 21: Chromolithographed ‘Crawford’s (of Edinburgh) Fairy Queen Biscuit Box Top.’

In Benoni White’s work sample scrapbook from the Belfast period.

By permission of the Whanganui Regional Museum, Archives.

Ref. No.: Benoni White Papers.

Crawford's Fairy Queen BISCUITS

Edinbvrgh

In New Zealand, even well into the twentieth century well-trained and experienced chromolithographers were rare. Institutional training had not been available as art schools were not founded until the late nineteenth century; Elam in Auckland not until 1890 for instance.⁷⁷ Such an artist as Benoni White would have been sought after: not only was he a lithographic artist, but in addition brought with him a keen interest in the more modern art of photography, as well as practical photographic skills. These attributes would have fitted with the graphic aspirations of A.D. Willis, many of whose chromolithographic publications, especially the views of cities of New Zealand, were based on photographs.

In 1901, around the time that Benoni White began working for Willis, the New Zealand Department of Tourist and Publicity was established. This had been the brainchild of Sir Joseph Ward, the Minister of Railways, as he thought that "more traffic could be encouraged if the country's health resorts and scenic attractions were popularised," and accordingly, in the same year, the (ephemeral) Tourist Traffic Branch of the New Zealand Railways was formed, as well as the Department of Tourist and Health Resorts, which was added to the Department of Industries and Commerce, and was charged with promoting tourism to New Zealand from overseas. Statutory form was given to this policy in 1906, and one of the directions to be pursued was "tourist publicity". It has been said that the most important outcome of these initiatives was the creation of Rotorua in the first two decades of the twentieth century, partly through the formation of an Advertising Office which had a photographic section.⁷⁸ Print products published by A.D. Willis and prepared by Benoni White which have survived from this period were in keeping with these trends, an example being a series of ten chromolithographed postcards depicting Maoris in the Rotorua thermal district. (See below: Ephemera.)

In a letter dated October 1908, the year that Archibald Willis died, the general Manager of the Department of Tourist and Health Resorts wrote to inform Benoni White that he was unable to use "original work on an illustrated river trip, Wanganui – Taumaranui – Wanganui" that White had submitted to him for possible publication, because the department had already sent its own journalist to prepare a booklet on the area, and suggested that White's manuscript, which had been illustrated with his own photographs, should be submitted instead to Mr Hatrick, the owner of the Wanganui Riverboat Company, "as such matter nicely printed and illustrated would make a most effective advertisement."⁷⁹ By then, many of the photographs required for publications to feed the tourist industry were being provided by the staff photographers of such government departments: the private photographer was facing an increasingly competitive environment. As well, the high cost of

chromolithography meant that it was increasingly the larger printing works associated with some of the weekly newspapers in the main centres that were gaining dominance in the field of colour work whether for prints to be distributed with the annual Christmas numbers, or for the jobbing work that the business took in tandem with their newspaper enterprises. In such businesses, process plants were being installed to enable three and four colour process work to take over some of the colour jobs formerly executed via chromolithography: colour printing was going forward into the photomechanical era. (See chapter 10 on the special numbers from the weekly newspapers.) The age of photography had come, and commercial lithographic artists at the time needed skills in both areas. At Willises, Benoni White was such a lithographic artist.

A.D. Willis the Colour Printer

The work of the chromolithographic artist involved planning the whole colour printing process in advance, both the number and order of printings, as well as planning which particular areas were to be printed in which colours, in order to arrive at the desired result after completion of the successive printings, through both the addition of successive areas of colour, and by the creation of further colours as blending was anticipated in the overprinted areas. To give highlights, scraped out portions were often left in white. At the same time the order and amount of ink applied had to allow for some areas to be more lightly printed to eventually give a balanced composition with regard to both light and shade and colour contrast.

The successful employment of such a process required not only lithographic and artistic skills, but also a knowledge of the behaviour of inks, and a further essential attribute was the possession of excellent colour vision. The latter was necessary to make the colour judgements, to assess the results from the successive proofs, and to decide what adjustments if any were needed. When it is remembered that this work pre-dates the modern environment of standardised inks and calculative processes that were more mechanised, the colour judgement tasks performed by the old chromolithographers can be appreciated as having been difficult in the extreme. It is interesting that the colour vision ability of the human eye has still not been surpassed, and is even today the best instrument for assessing colour printed proofs. (See chapter 12.)

The Colour Process: Chromolithography

From both surviving products that were colour printed by the firm of A.D. Willis, and from advertisements detailing some of the print products, it can be seen that chromolithography was undertaken at the firm of A.D. Willis from about 1883, around twenty years after the

first introduction of this form of colour printing to the colony. Both tint lithography and chromolithography was used during the period to 1914. Particularly informative are the examples of the successive proof states of the chromolithographic process in use at the firm around the early part of the twentieth century. One of these items is the colour printed 'Souvenir of the Royal Visit to New Zealand', a invitation to attend a Maori demonstration at Rotorua on 15th June 1901, held on the occasion of the visit of the Duke and Duchess of Cornwall and York to New Zealand. That Benoni White was the chromolithographic artist for this item and the printer A.D. Willis appears at the bottom of the finished product, a copy of which is also held in the Alexander Turnbull Library. (Plate 22, 1.)

However, the series of successive chromolithographic states/proofs of this item are held in the Whanganui Regional Museum. (Plates 22, 2 - 9.) According to the hand-written note on it, the item shown in Plate 22, 9 is the artist's proof. The colour strip used to judge any colour correction needed can be seen at the top, and this can also be used to follow the order of the successive colour printings in the proofs that survive. An original artist's sketch in black and white has survived also, (Plate 22, 2), along with an early state in which several colours have been applied. (Plate 22, 3). However, this attempt was apparently then abandoned, and the chromolithograph that was eventually produced was instead built up using successive colour printings without the black key. Plates 22, 4- 8 demonstrate that fourteen colours were used to gradually build up to the artist's proof stage.⁸⁰ It appears that some colour simplification was made before the invitation was finally printed in twelve colours. (Plate 22, 1). Such a printing process would have needed successive impressions from probably as many stones, each with the area demarcated and inked in one particular colour, so that the final colour was achieved after over-printed impressions had been taken.

That lithographic stones were definitely used at Willises is confirmed from an 1885 publication by R.W. Pownall, *Illustrated Guide to the West Coast of the North Island, N.Z. Describing the Various Towns and Adjacent Land Available for Settlement*. The titlepage states that the text is "Accompanied by ten Drawings on Stone, by W. Potts, from sketches by R.W. Pownall, A.V. A. Wanganui: A.D. Willis, Printer, Caxton Buildings, Victoria Avenue, 1885." These illustrative black and white lithographs are held at the Whanganui Regional Museum as loose prints. Although not in colour, such illustrations demonstrate one type of basic key-stone image used at this firm, especially in the earlier William Potts period, as the first stage of the chromolithographic process, that is, the stage of transfer to stone of an artist's original via redrawing. This was often interpretive redrawing, a process in which the lithographic artist would sometimes 'improve' on the original.

Once the image was committed to stone, if desired, it could then be used as the key stone for subsequent colour printing from either tint stones when less expensive colour was wanted, or from the nine to twelve colour stones commonly used at Willises for a full chromolithograph. William Potts in this instance used a direct chalk style for the lithographs. It is likely that, in addition to direct drawing on stone, transfer lithography was in use at this firm, a process which could be achieved photomechanically or by artist's interpretation on transfer paper. Such a process was commonly used for printing many small designs at once on a single stone, such as were needed, for instance for the job printing of small items like food labels, which were among the products colour-printed by A.D. Willis. The transfer of an image from a piece of transfer paper to the stone was commonly effected by passing it through the press face down on the stone, when the grease of the image would stick to the stone. Although detailed records from the firm of A.D. Willis have not survived, methods of transfer in use in New Zealand may be inferred from those that have, such as the account describing the methods used in 1897 at Wilson & Horton. (See chapter 7.) It is likely that, in such a small country, the basic lithographic processes used by firms executing this kind of job printing were not vastly different, although developmental stages may show time lags from place to place, for instance, for the progressive installation of equipment, or the adoption of a later form of an essentially similar process or convention.

As pointed out by Geoffrey Wakeman, unless the process has been specifically stated on a plate or print product, "it is difficult to distinguish a transfer lithograph from one drawn direct on the stone."⁸¹ However, examination of the print products that were produced by the firm of A.D. Willis to 1914, and that remain as artifacts, can assist the discovery of some of the facts concerning the firm's colour printing practices. The wide range of artifacts includes not only the larger productions, the colour-printed books, booklets and prints, but also ephemeral items such as Christmas and other greetings cards, playing cards, and food labels. For example, from the proof states of the 1901 'Souvenir of the Royal Visit...' it can be seen both by using a x 10 lens and from the colour strip, that shades of yellow were the first areas of colour printed in solids, stipples and some prepared tints to give shading and texture, the latter in the space to be overprinted with the invitation words. Subsequent

Plate 22: 1-9: 'Souvenir of the Royal Visit to New Zealand. An Invitation to Attend a Maori Demonstration at Rotorua on 15th June 1901.'

1: The chromolithographed invitation. 2: Original drawing. 3: Early attempt.

4-8: Successive chromolithographic printings. 9: Artist's proof.

Benoni White was the chromolithographic artist for this item and the printer was A.D. Willis.

By permission of the Whanganui Regional Museum, Archives.

Ref. No.: A.D. Willis Papers.

COLORED BY THE
MUSEUM

COLORED BY THE
MUSEUM

WETA

WETA

DRED

WETA

WETA

WETA

O. A. & Co. Ltd. London *Applied Postage* *Postmark*

overprinting then added the background light blue, pink, the 'water' blue and the red successively. Further colours gradually built up the design, with overprinting, for instance of the brighter blue forming the shade of blue wanted for the flag and contributing to the shades of green for the palm tree. The darker colours of brown and grey which were printed last gradually gave greater depth, contrast and definition to the whole composition, and finally the words of invitation were added. This version proceeded to become the final product, as can be seen from the finished example. (Plate 22, 1.)

Although they do not have the informative colour strip, surviving stages/states of some of the Maori Art Post Cards drawn by Benoni White and issued by A.D. Willis also still exist. (Plate 23, 1-8.) It can be seen from these, for instance from the three stages of the post-card 'A Secluded Retreat', that in this instance a 'key' image in black or grey has been used as the basis, and that colour was added by subsequent overprintings. From the first, when chromolithography had been undertaken by William Potts at Willis in the eighties, it had been standard practice to work from a photograph to obtain the key block, for instance for the many views of New Zealand cities and towns that were produced in colour in that era. The process used to carry out tint lithography was really a simplified form of the same process, but owing to the limited number of impressions needed, and the simplified form of colour analysis, was not as expensive. In this case, the first impression was usually in black or grey chalk style lithography for the basic image, and then one or two subsequent impressions from the tint stones to add a limited amount of colour, usually in simpler shapes and even tones, such as that employed for an advanced form of tint lithography used for the production of the illustration for H.C. Field's *The Ferns of New Zealand*. (See below: Other Colour-printed Books.)

Photolithography

Information concerning the processes sometimes can also be gleaned from a commentary or other reference made at the time of publication. It can be said that photolithography was certainly in use at the firm of A.D. Willis by 1890, the year of publication of *The Ferns of New Zealand* by H.C. Field. In the listing for this work in the 'New Books' column that appeared in blue/grey light card covers as the *Monthly Record of Scientific and Educational News Circular of New Books New Editions, Standard Works, Etc.* (new series) between pages 28 and 29 of *Typo* for March 1891, mention was made of that process in the statement "Illustrated with 29 Plates by Photo-lithography" and is evidence that this had been the basic process by which the illustrative drawings had been transferred to stone for that work.⁸² From later artifacts it can be seen that the photomechanical processes were increasingly

employed, for instance in the production of postcards featuring Maori and the thermal areas from 1903 to 1915, and this was consonant with the fact that the later lithographic artist, Benoni White, was both artist and photographer. An example was a postcard of 'Lake Rotorua' "by Benoni White" that had been photolithographed in black and white around 1907 and for which A.D. Willis was acknowledged as publisher.⁸³

Printery Equipment: Plant and Machines

The *Cyclopedia of New Zealand* commented that at the firm of A.D. Willis all branches of commercial printing were covered, and consequently the diversity of equipment to be seen at the plant there reflected the range of machinery in use in New Zealand around the turn of the twentieth century.

The works are replete with a full plant for all branches of the trade, including double-crown and demy lithographic machines, demy roller press, self-stopping double ruling machine, demy folio platen and hand platen card machines, power label cutter and power guillotine, stapling and perforating machines, power mill board and cardboard cutters, and many other contrivances for the work. A gas engine – four horse-power nominal but capable of working up to ten-horse-power, made by Crossley Bros. – drives the machinery.⁸⁴

For the exacting task of colour printing, the standard of plant had been up-to-date and equal to requirements for some time. In 1889, the year that Willis printed and published the extensively chromolithographed *New Zealand Illustrated*, (See section: View Books) Dr T.M. Hocken had paid a visit to the printery, and was reported as having been "both surprised and pleased at the perfection of Mr. Willis's plant and apparatus for lithographic printing",⁸⁵ while a few years later, in 1896, the *New Zealand Christmas Mail* stated that A.D. Willis' lithographic plant was one of the finest in Australasia. Apparently Archibald Willis paid great personal attention to the standard of his machinery and equipment, as he travelled extensively overseas seeking to upgrade his plant to keep abreast of the times. In 1895 he had himself made a trip to England, the Continent and to America in order to procure the latest and best machinery.⁸⁶ In the department concerned with the manufacture of playing cards, A.D. Willis employed the machine that was reportedly the only one of its kind in the southern hemisphere, although the source, the *Cyclopedia*, does not specify what that machine was. However, R.C. Harding mentioned in *Typo* that A.D. Willis held a patent for cutting circular-cornered cards.⁸⁷ Willis is known to have maintained commercial relationships with "the best publishing and other firms" in Britain, and had a London agent

Plate 23: 1-9. 'New Zealand Maori Art Post Cards.'

"Series of eight subjects illustrative of native life, from drawings by Benoni White."

Shows several in successive stages/states of production.

1. 'A Secluded Retreat.' 2. 'Rapids Ahead!' 3. 'Canoe Race!' 4. 'The Old Story.'

5. 'The Bath.' 6. 'Fishing Day in the Pa.' 7. 'Visitors!' 8. 'In Search of Foe.'

9. Cover, with unused image below. Issued by A.D. Willis.

By permission of the Whanganui Regional Museum, Archives.

Ref. No. A.D. Willis Papers.

RAPIDS AHEAD! There is no way in which the Miami shows greater skill with the canoe than in negotiating the rapids.

CANOE RACE. Much devoted to athletics, the Minores take the keenest interest in exciting contests of this kind.

THE OLD STORY! In love, as in war, the youthful Maori thinks it fair to requisition a convenient war canoe to further the purpose of gentle conquest.

THE BATH. The Maori maid, tired of hillside rombles, pushes through the flax to her favourite bathing place.

ISLANDS: The Maori is noted for hospitality.
Here the Chief shows welcome to the still distant arrivals.

IN SEARCH OF FOE.
This Maori War Canoe has a typical
carved prow—"dug out" of a single tree.
Some Canoes carried 100 warriors.

NEW ZEALAND

Maori Art Post Cards. **2**

Series of Eight Subjects
Illustrative of Native Life,
FROM DRAWINGS BY BENONI WHITE.

PRICE. ONE SHILLING.

ISSUED BY
A. D. WILLIS, Wanganui.

for his own business, Messrs. William Dawson and Sons in Cannon Street, although he imported his own printing supplies of “general stationery, books, paper, cards, almanacs, brown paper bags, and fancy goods” directly.⁸⁸

Types of Colour-Printed Products

The nature of A.D. Willis’ printing business was described in the *Cyclopedia* as being a large job printing business: it is interesting that although Willis had had extensive experience in New Zealand working in newspaper printing firms, in the end he did not establish his own Wanganui newspaper printing business, although he had previously contemplated such an enterprise. Instead, Willis concentrated on job printing, specialising particularly in the colour products for which he must have seen a viable market. It is interesting to note that many of his print products echoed those produced at the firm he had joined at twelve years old, Eyre and Spottiswoodes of London, and his early memory of those and his perception that there was an unfulfilled niche for similar products, but with a New Zealand flavour, may have led to his exploitation of such a perceived business opportunity. That Willis was interested in producing printed goods not only for the thriving town of Wanganui, but also for the wider New Zealand market, is indicated by the fact that he sent commercial travellers to periodically visit towns and settlements all over the colony. That Willis himself travelled to other parts of the country on business is apparent from a report in the *Wanganui Chronicle* in September 1886, by which time he was promoting his colour printed Christmas cards:

Mr Willis is now in Oamaru on his way north from visiting the southern towns, and as a result his Christmas cards may now be obtained from the booksellers of Oamaru and other places. Other art work of Mr Willis’s may also be obtained just now, in the same way, notably various views—large enough and valuable enough for framing—of the famous Pink and White Terraces which were the glory of Lake Rotomahana until they were destroyed by the eruption of Mount Tarawera on the 10th of June this year.⁸⁹

Perhaps the friendship with John Ballance had originally oriented Archibald Willis towards the wider national viewpoint necessary to national politics, which he then applied to business, but it can be seen that from his own wide working experience that he was already aware of the New Zealand environment well beyond the region in which he had settled, not only the natural and built environment which appeared as images in so many of the colour-printed products, but also that of public opinion which was so much a part of the market environment. Although towards the last decades of the nineteenth century, regionalism was giving way to a greater nationalism in New Zealand, especially with the coming of the telegraph, this was not yet common at the time Willis took the wider market view. In addition to such vision, he had early understood the necessity and power of advertising to firstly bring in business and then, after supplying continuing information to the market, to

maintain, increase and/or diversify production as indicated by the response. Willis' advertisements, found in various publications of the times, have yielded much information concerning the colour print products he marketed.

Advertising The Colour Print Products

Seeing the business advantage of advertising, Willis used more than one avenue to advertise well ahead. The local newspapers such as the *Wanganui Chronicle* carried advertisements inserted by Willis, as mentioned. The regional almanacs regularly carried advertisements for Willis' print products and available printing services, for example, in those published in Wanganui, such as the *Star Almanac and Directory*, the *Wanganui Almanack and Town and Country Directory*, *H.I. Jones' Shilling Almanack and Directory*; and in those from out-of-town, such as the *Wellington Almanac*. Sometimes advertisements took less predictable forms, such as those carried on the extra playing card provided in each pack that Willis marketed as 'New Zealand Playing Cards'. (See below: Ephemera) Journals were another avenue for advertising and when for instance, the trade journal *Typo* appeared, Willis was quick to see the potential for advertising colour printing for the trade, and to give greater publicity to such colour printed items as his chromolithographed cards and view prints.

Typo Advertisements from A.D. Willis

As stated in chapter 7, advertisements from A.D. Willis were in fact among the few that appeared in *Typo* for print products that had been produced in New Zealand. During his printing career it is likely that Willis knew of R.C. Harding and appreciated his calibre, although during Willis' early *Hawkes Bay Herald* period, Harding, who was seven years younger, would have only been a boy. In *Typo*'s first year, in the issue for July 1887, the first advertisement placed by A.D. Willis particularly announced the imminence of his new "superior" range of colour-printed Christmas cards. With two illustrations in black and white, the advertisement also highlighted Willis' playing cards, ball programmes, and other colour printed products:

A.D. Willis, Chromolithographer and Bookseller, Wanganui, has much pleasure in announcing that his new Christmas Cards for this year will shortly be ready for the inspection of the Trade, and will be found superior to any before shown by him. Large reductions in prices on previously-issued cards.

The Shilling Pack of Playing Cards is excellent value, and is in large demand.

Ball Programmes, from one to nine printings, for the use of Printers, are 25 per cent cheaper than the imported ones. Thirty varieties to choose from.

Also large variety Printers' Cards in three printings, and Octavo Handbills, at very low prices.

Samples on application.

Chromo Printing Executed for the Trade.⁹⁰

This advertisement was repeated in each issue of the first volume of *Typo*. R.C. Harding's comments on Willis' reputation in the July issue, pointing out that his ball programmes were well-known to printers, and his greeting cards to booksellers, acted to enhance the

effect of these advertisements. The initial July placement, allowing a long lead-in time before Christmas shows Willis as well-organised, while the variety of chromolithographically printed items indicated a businessman of enterprise, one who saw the opportunity to supply the trade using colour as a point of difference. At least since 1883, colour had been employed in many items, including the Christmas cards. For perspective on the costs relative to the times, it will be recalled from chapter 7 that in 1875, the cost of a 2lb. loaf of bread had been 4½d. and of a glass of beer 6d. Willis' regular prices were 1/- for the large size cards, and 6d. for the small.

As already mentioned in regard to the 1887-1888 *Typo* advertisements from this firm, A.D. Willis of Wanganui frequently advertised his ability to carry out colour printing for the trade using chromolithography; the statement "Chromo-Printing executed for the Trade" always appeared at the end of his insertions. In the second 1888 volume of *Typo*, a new advertisement was placed that was repeated within that volume three times and that introduced a new element, a vignette of Mt Egmont, which, although printed in black and white, draws attention to another of Willis' colour products: his chromolithographically printed views. It can be seen that Willis had also diversified, and was producing New Year cards for those who did not wish to celebrate a Christian festival.

A.D. Willis, Chromolithographer and Bookseller, Wanganui, would direct attention to his latest novelties in New Zealand Views. Playing cards, Programmes, Menu Cards, Christmas cards, Bordered cards, New Year cards, Manufactured stationery. All of best quality, and at prices far below the imported article. New shilling Christmas cards from designs by Miss Stoddart, Christchurch. No 66 New Zealand Sunrise, No 67 View on West Coast. May be had made up in newest style in silk or plush mounts. All the earlier patterns at greatly reduced prices. Large views of all the Principal Towns of the Colony in nine printings 1/6 each. Chromo-Printing executed for the Trade.⁹¹

The number of printings was consonant with a chromolithographer who was confident with the process, and diversification into new products was good for business, especially because his market perception had been accurate. At the time there was not only growing interest in travel in the Old World, where many of the Christmas cards would be sent, but also images portraying views had the potential to help fulfil a natural colonial desire for consolidating a new identity. For the colonials, a depiction of the environment around them would help to foster a feeling of belonging, especially as seen through the eyes of an artist such as Miss Stoddart who herself was a colonist. However, it was not only for the immigrants, but also for the growing number of people whose birth-place was New Zealand that the availability of attractive colour views would have been desirable. Such images had the potential to help reflect this aspect of the country both to the local inhabitants and to others. In turn, such images could encourage overseas visitors to come and see for themselves, and New Zealand colonials to venture further in the new country. By sitting comfortably with their probable

desire to communicate a pride in their adopted environment to relatives elsewhere, such views would be expected to be desirable items, but also they were likely to be purchased by the residents for themselves.

The fascinating and naturally beautiful environment was becoming more widely known through such images: by now there was a large body of original art-works depicting the colony, and an increasing number of reproductive works was available. Many possessed the added attraction of colour, and some of them were now being produced locally in New Zealand. At the time, the growing popularity of the camera was making the view a popular item, but because colour was not yet integrally possible in photographs, printers such as Willis had obtained a market advantage with his chromolithographic views. For one of two views, of Wellington and Napier, both of which had been published by June 1888, R.C. Harding mentioned that the Napier view was after a photograph taken by S. Carnell, which he himself had originally published.⁹² For the time being, Willis had the best of both worlds, and was taking advantage of it. The fact that the views at 1/6d each were advertised as having had nine printings, indicated that at the firm of A.D. Willis no expense was being spared for the chromolithography of items such as these, but in spite of this the firm was doing well and expanding.

Such products were timely in that they were fulfilling a market niche. The tourist would be likely to purchase such images as a reminder of a travel experience in a unique environment. New Zealand was by this time becoming known as a tourist destination, and gradually this industry was to be responsible for earning major overseas capital. By the eighties, revenue was sorely needed owing to the economic difficulties that beset the country, and Willis was thus assisting the promotion of the natural assets that were, economically speaking, potentially very important.

Networking and Advertisements in the Freethought Review

Indeed, A.D. Willis had earlier shown his business enterprise by taking other opportunities to place advertisements for his early chromolithographed Christmas cards in local reading matter such as the newspapers and the *Freethought Review*, which he had published between 1883 and 1885 at his Caxton Printing Works in Victoria Avenue. It was claimed in the publication that “simultaneously in several parts of New Zealand Freethought societies have been organized.”⁹³ As a member of the freethought movement, Archibald Willis was part of a trend that saw much publishing of works of a philosophical and religious nature at the time. The *Freethought Review* declared that in New Zealand, the intention was “to discuss questions affecting society...[and] problems in religion and politics, on the solution

of which the social conditions themselves depend."⁹⁴ It was said that by that time (the early eighties) it was estimated that there were about eight million freethinkers in the United States, and that it had been principally due to friends in Dunedin that the movement was spreading to every town of importance in the New Zealand colony. There were links, too, with Australia, for instance, advertisements appeared for W.H. Terry, a Melbourne bookseller. The New Zealand *Freethought Review* was on sale at least in Dunedin, Auckland and Wanganui.

A.D. Willis realised that a larger market was to be tapped through such wider networks, and accordingly advertised his own print products in the journal. It is clear that Willis was at least aiming for a New Zealand-wide market, to be served partly by post. With reference to a newly published book, *Land and the People*, as advertised in this journal in 1884, postage added 1d to the cost of the purchase: "Price sixpence; or by post to any part of N.Z., sevenpence. Published by A.D. Willis, Bookseller, Wanganui."⁹⁵ Taking advantage of the business opportunity, in the first issue which appeared on 1st October 1883, Willis placed a full column (of the two per page) advertisement on page 8 headed 'New Zealand Christmas Cards'. This was the earliest reference to these products which I have yet seen, and contain many clues as to what motivated A.D. Willis in his business enterprise as a colour printer. Not least was his interest in colour in the natural visual environment. Descriptions of his cards in the *Freethought Review*, of those featuring New Zealand's indigenous flora, and of the scenic view cards, contain many evocative allusions to colour.

Now ready for sending home by mail. Beautifully designed, and printed in colours by means of chromolithography. To be obtained from the principal booksellers throughout the colony, or from the publisher, Wanganui. Price: 6d., 9d., and 1s. each, including postage. Mr A.D. Willis has much pleasure in submitting to the public of New Zealand his series of Christmas cards, executed at his Caxton Printing Works, Wanganui. In order to secure fidelity of design and taste in execution, the services of one of the most skilful and experienced artists from the Home country have been secured, and the result of his labors is a collection of scenes which Mr. Willis has the utmost confidence and satisfaction in placing before the public. These scenes embrace views of special interest, showing out to advantage these glimpses of mountain, lake, and glen, which, from the hands of a capable artist, are so well worth preservation; and other views reproduce the flora of New Zealand, in all the peculiar grandeur and charm of foliage and flower. Every scene has been executed from sketches actually taken by the artist in the bush, and the aspect of the snow-clad mountains and the effect of sun and shade are the results of his own personal observation. That the work has been ably and conscientiously carried out in every department of chromo-lithography, and every process of colouring will be obvious from an examination of the cards; and the publisher can confidently point to them as proofs that artistic work of this kind can be produced in New Zealand equal to the very best of the imported cards. The main object of the publisher in issuing a series involving such an expenditure of skill, labor and time, has been to supply the special want long felt by the residents of the colony who may wish to send to their friends on the other side of the world pictorial illustrations which shall convey an adequate idea and a tasteful realisation of the land we live in. Both in the strict fidelity to nature of the designs, and in the rich and suitable coloring, it is believed that this object has been fully attained. Several of the views have been submitted to skilled judges and experts, as well as to persons familiar with the scenes represented. They have excited the warmest admiration, and called forth expressions of surprise that work of such a kind can be produced in New Zealand on such a scale of finish and completeness. From the list of views which will be found below, it will be seen how wonderfully varied they are in their sources and designs.

Tree Ferns etc.

POROPORO – With its tapering leaf and striking flower.

TUTU - The tints of the drooping flowers being reproduced in all their beautiful shades.

NIKAU PALM - Most celebrated of the New Zealand flora, the majesty and grace of the spreading leaves being beautifully depicted.

KARAKA - In this the transition tints of the berries, from olive green to a bright orange, are well shown.

TAWA - Shewing the pretty purple berries on which the New Zealand pigeon generally feeds.

TITOKI - The New Zealand raspberry, where handsome clusters of berries make this tree remarkable.

HOUHI - the white open petals, with a faint yellow centre, are worthy of note.

PONGA FERN - One of the finest of New Zealand tree ferns, the canopy of arching fronds constituting an effective picture.

KAREAO - The peculiar shape of the leaf and the bright scarlet berries of the Supplejack are here represented.

MOCK ORANGE - Shewing the contrast of the tiny white flowers and the rich orange berries.

BLACK MAIRIE - The spear-like leaves and variously-tinted berries of this well-known timber tree are shewn to advantage.

WHERO-WHERO - The drooping leaves and berries of this parasitic plant are well represented.

POHUTAKAWA - The gorgeous appearance of these flowers has been well caught by the artist, who has here produced one of the most brilliant glimpses of scarlet in the New Zealand bush.

Views

RUAPEHU - From the Wanganui side. The view is surrounded by a cluster of ti-tree flowers and foliage.

MITRE PEAK - Milford Sound.

RANGITOTO ISLAND - At entrance to Auckland harbor.

MOUNT EGMONT - A belt of cloud surrounding the snow-clad cone.

MOUNT COOK - From the Canterbury side, with mountain torrent issuing from its base.

LAKE MANAPOURI - With snow-clad mountains in the background.

LAKE ROTORUA - At evening, with the shadows lengthening in the placid lake.

That Willis was oriented towards producing what he perceived the market wanted is brought out by the fact that in this advertisement he states that he was fulfilling an express market request rather than being speculative. This in itself could have been a spur to acquisition by those potential customers who felt confirmed in their choice if they knew that such items were known to be desired by others. As well, Willis used the contemporary interest in scientific detail as a selling point, and his cards were obtainable by post, a condition that was suitable to a colony in which a considerable portion of the population was in a rural situation. The descriptions, which give many details of the specific subjects depicted, are indicative of how colour printed products such as these were made to cater to this interest, to satisfy a market demand for graphic images with the quality of verisimilitude, part of which was truth of colour. Allied to this was the by-now perceived market preference for images produced from first-hand observation, and Willis' attention to this aspect also is evident. Allusion to high standards in Willis' advertisements makes it clear that there was interest in this aspect from the client's point of view: reference to authoritative opinion was intended no doubt to give reassurance on the quality aspect. Favourable comparison with Old World standards was also indicative that by now such an aspect was considered important to the Trade, and by inference, also to the general public who were the ultimate buyers of these colour print products. Such reference also showed that overseas products were being used as the yardstick in this regard.

Overseas and New Zealand Greetings Cards and Postcards

Christmas cards as a genre were not new. Since George Baxter had pioneered the cheaper colour printing of small images the way had been opened for the colour printing of such items to be mass-produced. It is thought that in the early 1850s "the production on a large scale of Christmas and New Year cards began in Britain,"⁹⁶ and that by the eighteen sixties the custom of sending such greetings cards had become fashionable.⁹⁷ Although by 1883 it was not the first time New Zealand Christmas cards had been produced, the probability is that A.D. Willis was the first New Zealand printer in the colony to produce such chromolithographically printed cards. Previous Christmas greeting cards had been made by artists such as John Philemon Backhouse, the New Zealand artist who had painted small views, for instance, of the White Terraces for a Christmas card painted in oils around 1880.⁹⁸ However, the fact that Willis' cards were produced from a printing process meant that they could be easily multiplied to make them more widely available.

The earliest known postcards to have been printed in colour anywhere in the world was a series depicting seasonal icons, such as green holly and red berries, on the back of the card of the first English halfpenny Post Office postcards. These can be seen as being hybrid postcard/Christmas cards, and represented a short step forward from the first plainer British postcard, issued in October 1870: it was an obvious step to make a special effort for the Christmas issue by printing the decoration in colours. These cards had been published by John S. Day of London.⁹⁹ A reproductive illustration in Frank Staff's book *The Picture Postcard and its Origins* (Literature Review: 26) shows the card with a highly decorative border of holly and berries printed in at least five colours on a grey ground, with the heading "Christmas Greetings", and a poem as the centrepiece. The imprint appears underneath: "John S. Day, Lithographer & Printer, Savoy St. Strand, London. W.C." However, restrictions, such as those preventing private British firms publishing postcards, inhibited the development of such enterprise in Britain, and coloured picture postcards did not become commercially viable for printers there until much later. (See chapter 11.)

R.M. Burch has suggested 1882 as the year in which the first coloured picture postcards were marketed, the Italian firm of Danesi possibly being the first to commence their publication. Burch also stated that, in this instance, "because there was no demand for them the enterprise was soon abandoned."¹⁰⁰ However, by 1883 in New Zealand, A.D. Willis was advertising his pictorial Christmas cards, which were decorated with views and the New Zealand flora rather than with traditional Christmas symbols such as holly. In this case Willis had perceived a demand before going into production. Although lithography was

already a branch of the firm, it appears that card production had commenced when Willis had obtained the services of the overseas-trained chromolithographer William Potts. The appearance of card advertisements was around the time Potts had commenced chromolithography at the firm. It can be said that the early cards from Willis were hybrid Christmas/pictorial cards, although his New Zealand pictorial postcards were to come later.

The choice and descriptions of the views gracing the early Christmas cards reflect the fact that by now many features of the New Zealand topography were becoming better known. Willis was at once capitalising on this, and adding to their popularity by making available images that depicted such features—such cards were presumably fulfilling a demand. Perhaps the benign beauty of many of these natural images were desirable because they reflected a positive side of colonial identity, and helped to offset and keep hidden the darker side of life that was present in the nineteenth century New Zealand social sphere. As previously mentioned, the latter was described by the social historian Miles Fairburn as being marked by loneliness, drunkenness and violence, all of which were ascribed to the isolation and lack of organised social life,¹⁰¹ especially in the period between settlement and around 1880, and was termed the ‘atomised’ society. That this condition was actively hidden was seen as a result of the fact that colonists wished to “boost New Zealand’s virtues in order to attract a sufficient flow of immigrants and capital necessary for ‘development.’”¹⁰²

Many of the items set out in Willis’ advertisements were similar to those in a *Typo* advertisement of 1890, placed by Willis’ old firm, Eyre and Spottiswoode, listing “Booklets, Masonic and other Menu and Programme Cards, Christmas and New Year Cards,”¹⁰³ very much the kind of items produced by A.D. Willis. In the advertisement for this firm, itself in colour, attention is drawn not only to the list of products but also to the fact that the quality of their work had been demonstrated, including in the Southern hemisphere colonies. Through such demonstration it also was possible that Willis had been able to retain a familiarity with this firm’s current production. The advertisement stated that Eyre and Spottiswoode had won a gold medal in Paris in 1889, and two gold medals at the Melbourne Exhibition of 1888-89: they were a worthy model indeed. At the same exhibition, A.D. Willis had also received a second-class award for his cards.¹⁰⁴

It could be speculated that Willis was repeating what he already knew, perhaps prompted by sighting such examples of jobbing printing of inspiring standard from this firm. It is clear from Willis’ 1883 Christmas advertisement in the *Wanganui Chronicle* that he already sold

Christmas cards imported from England. Such print products were items used in daily life, whether in London or in the colonies, and it was possible that the combination of such a cue from his old firm and his perception of the potential of the New Zealand market provided the initial prompts for his colour printing. Whatever the initial spark, Willis' innovation lay in the fact that he was using forms already developed overseas, but was using them as a vehicle to convey the new subject matter from a new environment, and by using colour printing, an important visual dimension was being exploited. The new colony was home to a flora of which around eighty percent of the species were indigenous. In addition, many topographical features were inherently fascinating, and hence would be expected to become a viable selling point. That Willis made capital from all these features, and more, can be seen from the later 1888 advertisements that had appeared in *Typo*.

Products and Markets

Ephemeral Items Printed in Colours

Cards

The market for special occasion cards that A.D. Willis had discerned in New Zealand pointed him to the perfect print product format for which to use colour without the risks associated with a larger enterprise such as the publication of a colour printed book. The colour printing of cards for many occasions and uses appears to have become a staple of Willis' job printing, and these were among the items for which he became especially well-known. Some cards were printed to serve everyday purposes, others were to mark national occasions, and still others were recreational: as mentioned, it was A.D. Willis who began manufacturing playing cards in this part of the world. Although based in Wanganui, he maintained professional and business links with Britain, from where he imported a variety of supplies, while links within New Zealand were established and extended by travelling business representatives. Harding reported that in 1888 Willis himself, on his way to the Melbourne Exhibition, had visited him in Napier, bringing "excellent samples of his manufactured stationery, new patterns in programmes, [and] fancy bordered cards." Harding's judgement was that the "quality is so good, and the prices so low, that he cannot fail to find a large demand, both here and in the Australian colonies." Also mentioned was the fact that Willis had brought with him two new Christmas cards which had been designed by Miss Stoddart, and which were described as "exceedingly good." Indicative of the fact that by this time, the standard of colour printing at A.D. Willis, considered high in New Zealand, was also considered to compare favourably with standards in Australia, is Harding's report that Willis' exhibit in the Melbourne Exhibition was "spoken of in the highest terms by the press."¹⁰⁵ At the time, William Potts was the chromolithographer.

The card held in the Whanganui Regional Museum archives dating from this era, the invitation to Willis' staff dance in 1891, has a small chromolithographed view in the corner. Another, dating from the later Benoni White period, which opens out in a double door fashion, is the 'Memento of the Result of the Wanganui Election December 6th 1899' which was printed in the colours blue, pink, and gold, and which has a photograph of the Parliamentary Building reproduced on the back. This item demonstrates that although now incorporating the later process of black and white half-tone for the inset portraits and the building on the back, and by now using prepared tints to create the tint effect, (in this case, for the pink background), the standards at the firm of A.D. Willis had not slipped. The central half-tone portrait on this item is of A.D. Willis himself. (Plate 24.)

It is known too that Willis' letterpress standards were high. Harding had particularly singled out for mention, as an example of good typographic display work with original festoon work, an address, originally painted on silk in gold that had been printed in early 1888 for a religious denomination in Wanganui. Harding stated that the ornamentation was not overdone, and that "Reed's 'Artistic' corner ornaments [were] introduced with excellent effect."¹⁰⁶ The range of skills and equipment by then assembled at Wanganui was the basis for such quality printing whether letterpress or lithographic.

Colour Printed Christmas Cards

The Christmas cards that had been advertised for 1883 apparently had been well received by the market, since Willis had sold over 3000. In the second 1884 volume of the *Freethought Review* a fresh advertisement appeared on October 1st in number 13, detailing "New Christmas Cards by A.D. Willis."

--- New series of views for 1884. A.D. Willis, Chromolithographer, Wanganui, has much pleasure in drawing the attention of the public to his NEW CHRISTMAS CARDS, which are now ready. Most of the originals were painted for this work by some of the best artists in the Colony, and the sketches have been taken with the view of giving as great diversity as possible of our grand and picturesque scenery. The new series have been prepared with the utmost care by the chromo-artist, and are printed in twelve colours. No expense and trouble has been spared to maintain the reputation earned by the publisher of producing the finest Chromos in these Colonies, as acknowledged by the principal newspapers. The view in the series on hand consist of:-

	S.D.
On the Dart River	0-6
Mount Campbell	0-6
The Kaikouras (Marlborough)	1-0
Entering Milford Sound	1-0
In Milford Sound	0-6
Paekakariki (Wellington)	0-6
Waitangi Falls (Bay of Islands)	1-0

Plate 24: 'Memento of the Result of the Wanganui Election December 6th 1899.'
Printed at the firm of A.D. Willis.
By permission of the Whanganui Regional Museum, Archives.
Ref. No.: A.D. Willis Papers.

Result of the Wanganui Election, HOUSE OF REPRESENTATIVES,

Dec. 6th, 1899.

FOR THE	WILLIS, A. D.	2,578.
	CARSON, G.	2,163.
	MURPHY, J.	110.
Majority for Willis ..		704.

Waitakeri Falls (North of Auckland)	1-0
Lake Taupo	1-0
Lake Mavora (Otago)	1-0
Among the Ranges, Queenstown (Otago)	1-0
Wellington Heads	1-0
Lyttelton Harbour	1-0
Timaru Breakwater	1-0
Port Chalmers and Otago Heads	1-0
Ocean Beach, Dunedin	0-6
Breaksea Sound	1-0
Otira Gorge	1-0
Tararu Creek	1-0
Bowen Falls, Milford Sound	0-6
Head of Dusky Sound	0-6
Entrance to Dusky Sound	0-6

Reduction in Price of Last Year's Cards.

In order to increase the sales of last year's cards, the publisher has decided to reduce the price of the large size to 6d. each, and the small ones to 3d. each. They have been carefully reprinted this year, and many corrections made in the drawings. Over 3000 of these cards were sold in Wanganui last year to send away to friends out of the Colony, and the publisher is confident that when his new cards are seen, a most extensive demand will arise.

Wholesale Agents for the Australian Colonies:-

Messrs. Cowan & Co., Wholesale Stationers.

Wholesale Agent for Canterbury, Dunedin & Southland:-

Mr. J. Braithwaite, Booksellers, Dunedin.

And to be obtained from all the principal Booksellers throughout New Zealand.¹⁰⁷

The range of views was by now extensive, covering most parts of the country. Following this *Freethought Review* advertisement was another listing freethought titles on sale at Willis' shop. The same advertisement appeared on page 16 in the November issue, this time with an advertisement, rather than for the pamphlets, for his business, which included the statement "Letter-press and Lithographic Printing Executed in Superior Style." The advertisements for Christmas Cards continued, in the December issue, but without that for the pamphlets or the shop, and in the issues for each of the first four months of 1885, each time on page 16. Even though Christmas was now past, the subjects of the cards were such that it must have been judged that they would still sell.

Among the chromolithographed Christmas (and New Year) cards that have survived are those that were pasted into a book, signed "R. Coupland Harding" which was annotated as follows: "This is a complete sample book of the first crude issue of New Zealand chromolithographed Christmas cards by the late A.D. Willis of Whanganui. Most, if not all, of the floral studies were designed and drawn by my cousin, Miss Lydia Harding, of Whanganui, now (1911) Mrs. Swain, of Waipawa, Hawke's Bay." In pencil is written "ca 1886", apparently because of the inclusion of a New Year card with the chromolithographed image, 'Tarawera Eruption, N.Z. 1886.' Of the over fifty items in this collection, three bear a similar title to the images on the cards first advertised in 1883: 'Mt

Egmont' and 'Lake Manapouri' which are both New Year cards, and 'Nikau Palm', a Christmas card. In fact many of the cards advertised by Willis in 1883 do not appear in this collection. Perhaps the entire collection does not date from a single year, but since all the cards bear the A.D. Willis imprint, they appear to be from an early experimental period, perhaps not up to the later standards of design from Miss Stoddart commented on in 1888, and which, from the perspective of what could be achieved by 1911, could be seen, judged by Harding's exacting standards, as the cruder beginnings of colour printing for the mass market in New Zealand.¹⁰⁸ That improvement was from the beginning constantly sought by A.D. Willis is evident from the 1884 *Freethought Review* advertisement which pointed out that the cards from 1883 already had been "carefully reprinted and many corrections made in the drawings."

That some cards were chromolithographed from paintings and/or photographs that predate the Tarawera eruption can be seen from the inclusion of a Christmas card bearing the words "White Terraces destroyed by Eruption, 1886," perhaps from one of the last depictions of this ill-fated tourist attraction. This card is typical of the collection, and under x10 magnification could be seen to have been chromolithographed in pale grey, fawn, pale blue, orange, yellow, red, brown, green and darker fawn—nine printings in all. Behind the views a decorative spray of red flowers was printed. To provide finishing touches, gold was used to edge the card, to print a central circle surrounding a close-up view of the terraces (which also are shown at distance within a lower rectangular shape), and for the imprint "A.D. Willis, Wanganui, N.Z." (Plate 25A.)

The view card 'Wanganui,' (number 23 in the Harding collection) has had twelve printings, pink, red, pale and mid-blue, fawn, grey, maize-yellow, primary yellow, green, brown, orange and black, the last being used to depict ships on the river. This is consonant with the early advertisements for cards produced from twelve printings. All have been chromolithographed using from nine to twelve separate colours which involved using probably as many stones. In addition further colours have been formed by mixing during the course of overprinting. For example, for the card 'Waiwera, N.Z. & Poroporo' the poroporo appears in orange, brown, avocado and dark green. The white highlights have been scraped out, and the lighter avocado shade has been formed from the underlying yellow and light

Plate 25A: 'A Joyous Christmas. White Terraces Destroyed by Eruption, 1886.'

Chromolithographed Christmas card, 105 x 144 mm on album page ca.137 x 180 mm.

Printed and published by A.D. Willis, Wanganui, ca. 1886.

By permission of the Alexander Turnbull Library, Wellington, N.Z., Drawings and Prints.

Ref. No.: E-068-003.

White of Terra, N.C.
Designed by Eruption
1886

JOYOUS
CHRISTMAS

A.D. WALLIS WASHINGTON, D.C.

green which was printed first, with portions showing through the darker top colours to give pleasing visual effects of light and shade achieved by colour contrast. (Plate 25B.)

It can be seen from this collection that by 1886, the range of New Zealand chromolithographed images decorating Willis' seasonal cards had grown to cover much of the now famous and familiar scenery of the country, and incorporated images of the distinctive birds, such as the kiwi, as well as the flora. Some buildings and townscapes were represented, including Kawau, the residence of Sir George Grey, as well as views of Wanganui, Tauranga, Napier, and Queenstown. Willis' habit of naming the localities shows that his interest was not merely in decorative images, but in promoting New Zealand by familiarising the public with the colony. The scenery, the birds, the flora, and particularly the towns, cities and other infrastructure were all depicted, the latter to demonstrate achievements which were a source of demonstrable pride to the colonial society, and an indication of the developing economy. Such named images can sometimes be used to act as a primary source from which the locality of other un-named images can be identified, for instance the Grahamstown goldfield depicted on a small Willis Christmas card matches that depicted on a Sturtevant watercolour of 1901, enabling the town in that painting to be named as Thames.

Many of the earlier cards showed the now well-known scenery, for instance, Mount Egmont, which, being visible from Wanganui on a clear day, was an image often used by Willis, and is the subject of the card 'Mount Egmont, NZ from the Plains.' It was chromolithographed in nine colours, the first six comprising two blues, two yellows and two shades of red, to which was added grey, gold and dark brown, the whole being a recognised basic chromolithographic palette: a very similar palette had been advocated in 1885 by the authoritative W.D. Richmond in his textbook *Colour and Colour Printing as Applied to Lithography*:

An arrangement of blue (light and dark), red (pink and deep rose), yellow (golden and lemon), two greys and a dark brown, nine workings in all, will produce a fairly finished picture...¹⁰⁹

The orange of the foreground has been produced by overprinting yellow with red, as were the greens; by overprinting of blue on yellow. Other examples using a similar palette was a bright scene, 'Lake Mavora' in Otago (featuring red rather than orange in the foreground) and 'Pitau Fern, N.Z.' which featured a punga fern under a view of the Rangitata gorge in Canterbury. The effort to include an aspect of Maori life as being distinctive of the New Zealand environment is often found in small touches, such as through the presence of Maoris paddling their canoes in views depicting stretches of water, as is the case in both the

Egmont and the Lake Mavora scenes. Although not sophisticated chromolithographs in the sense that register is often quite approximate, such cards nevertheless represent an early attempt to bring colour printing to the mass market in New Zealand, while at the same time constituting a prudent business move: production on a small scale could test what was at first a small local market, but nevertheless one in which Willis could see potential, and which could expand, given the promise of further New Zealand tourism. In this judgement, time would prove him correct, both in the sense of the endurance and expansion of the colour printed greetings card market, and the future importance to the country of the tourist industry, which has always thrived on a diet of exotic images.

That such colour printed subjects would meet a receptive market could be supposed by the fact that, by the eighties, some books with colour images of New Zealand, for example, the famous *New Zealand Graphic and Descriptive* (1877) containing reproductions of Charles D. Barraud's paintings of New Zealand, were in circulation, although such productions, still quite costly, were mostly printed and published overseas. In this case the reproductive chromolithographs were by the London lithographer C.F. Kell. However, from A.D. Willis had come some of the first locally produced colour printed images of the New Zealand scenery and flora in the form of the 1883 chromolithographed greetings cards, and such chromolithographed images continued to flow from this Wanganui firm, gracing all manner of printed items, especially cards, as well as prints and later books.

The Later View Postcards

New Zealand views were again prominent among the images depicted when Willis began producing postcards, probably in the late nineties when Benoni White began to work for him. Frank Staff has stated that by the 1890s, although privately issued pictorial view cards were widely available in many European countries, "no such cards were available in Britain or the U.S.A." at the time because of regulations protecting the sale of Post Office cards, which had been officially issued since around 1870 in those countries. The coloured view post-cards held in the archival collection at Wanganui, again depicting icons of the New Zealand scenery such as Lake Manapouri and Geyser Whakarewarewa, were similarly issued by official sources: it is stated on the address side that they have been "issued by the New Zealand Government Department of Tourist and Health Resorts". Thus this particular

Plate 25B: 'A Glad New Year. Waiwera, N.Z. & Poroporo.'

Chromolithographed New Year card, 104 x 70mm on album page ca.137 x 180mm:

Printed and published by A.D. Willis, Wanganui, ca.1886.

By permission of the Alexander Turnbull Library, Wellington, N.Z., Drawings and Prints.

Ref. No.: E-068-008-2.

A GLAD NEW YEAR.

Wm. H. & P. P. P. P.

W. H. WILCOX, WASHINGTON, D.C.

set probably dates from after 1901. In New Zealand, the decorative elements for these official cards must have been commissioned from private firms as the design on the address side was engraved by the Wellington artist W.R. Bock, and the colour printing was by A.D. Willis. These cards, 14cm. x 9cm. in size, demonstrate the later stipple-style chromolithography commonly used by Benoni White. The set, from which I have examined eight cards, were chromolithographed in multiple printings using around ten colours in each: yellow, orange, putty, red, dark red, blue-grey, blue, tan, dark brown, and grey. (Plate 26, 1-5.)

As well as those mentioned above, other subjects included two scenes of Stewart Island, one each of Auckland Harbour and the Wanganui River, a view of Queenstown, and one entitled 'Maori Kainga'. In Britain, it had not been until after 1894¹¹⁰ when the private printing of postcards was allowed, that pictorial postcards printed in more than one or two colours had appeared: the previously officially produced cards had run only to one or two colour printing. Many of the pictorial cards from the continent, especially those from Germany, were also handsomely colour printed from about the mid-nineties. Through the efforts of A.D. Willis, for these items, local colour printing was keeping abreast of northern hemisphere trends. It can be said that these view postcards, appearing only a few years after such items were being colour printed in the northern hemisphere, were among the early examples that were fully colour printed from anywhere in the world.

Other post-cards printed by Willis from this era have Maori themes, which although by today's standards look somewhat crass, were popular at the time. With the front of each postcard printed with the words in red ink and the illustrations in colours, these were sold as a set in a blue-grey envelope on which is printed in black:

New Zealand Maori Art Post Cards. Series of Eight Subjects. Illustrative of Native Life. From Drawings by Benoni White. Price, One Shilling. Issued by A.D. Willis, Wanganui.

On the back of each postcard is printed "New Zealand POST CARD. The Address only to be written on this side."

That an effort was made to use correct terms for Maori artifacts is evident. A note in pencil on one proof of an image of a Maori canoe questions "Omit 'paddle' - say 'control canoes' or 'poling' - (?)." This is indicative of the learning process taking place between the two different cultures that had by now been dwelling side by side for over fifty years. According to *The Cyclopedia* the intention of such card and booklet illustrations was "to convey to friends at a distance a knowledge of Maori life and character, and afford some idea of the almost unlimited variety of scenery which is so attractive a characteristic of the colony."¹¹¹ It

can be observed that drawings were re-used for different purposes, as the head of the Maori woman depicted on the post-card 'The Bath' is very similar to that which appears on the booklet *Titbits from Maoriland* (1904). (See below: Booklets) Cards sometimes combined both the concept of the greeting card and the post-card in one format. In the (undated) set held in the Alexander Turnbull Library of this style, each card depicts a different Maori theme, all drawn by 'K.W.', probably Kennett Watkins. These are 'Maori Hospitality,' 'A Maori Challenge', 'A Maori Pa', 'Preparing Dinner', 'A Native Pet' and 'Natural Hot Baths'. All were lithographed in a simpler style in three browns, on a cream background. Each has been glazed, carries a seasonal message such as 'With the Compliments of the Season', and has an explanation of the picture printed inside a decorative border on the back.

An interesting card printed by A.D. Willis just after the turn of the twentieth century was a large (24.5cm. x 19cm.) Christmas card that had been especially designed and chromolithographed in several colours by Benoni White for the Wellington General Post Office itself. Featuring juxtaposed Maori and European themes, for example, a railway train steaming past a Maori Pa, and highlighting the post office building and the telegraph wires, the card reads "Christmas Greetings and Hearty Good Wishes for the New Year From the Officers of the General Post Office, Wellington. N.Z.". The chromolithography for this item had involved several printings to achieve the intended colour mixing. With magnification it could be seen that to form the flesh tones of the Maori woman's arm, a first pink impression had been overprinted by yellow then by blue, with shading and outline provided lastly by a dark brown printing. Inside the card, printed statistics indicate that by the end of the century the popularity of postcards was rising in New Zealand: "Number of postcards posted: 1899: 1,605, 383; 1900: 1,858, 064." (See also chapter 11.)

Playing Cards

Along with the Christmas, New Year, birthday, view and post cards, other specialist colour printed items produced by A.D. Willis were his circular-cornered playing cards. In 1896 it was reported in the Christmas number of the *New Zealand Mail* that Willis "now does a

Plate 26: 1-5: The later 'View Postcards' depicting icons of the New Zealand scenery.

1. 'Geyser, Whakarewarewa', with address side shown below. 2. 'Lake Manapouri.'

3. 'Auckland Harbour.' 4. 'Stewart Island.' 5. 'Queenstown.'

Issued by the New Zealand Government Department of Tourist and Health Resorts.

Printer: A.D. Willis. Colour printing executed in stipple-style chromolithography by

Benoni White. Address side: original engraving by W.R. Bock.

By permission of the Whanganui Regional Museum, Archives.

Ref. No.: A.D. Willis Papers.

Series White 361

4 1/2 x 3 1/4, Coloured, 100 per cent, X2

Geysers, Whakarewarewa, New Zealand

NEW ZEALAND POST CARD (CARTE POSTALE)

ISSUED BY THE NEW ZEALAND GOVERNMENT DEPARTMENT
OF
TOURIST & HEALTH RESORTS.

PUT
STAMP
HERE

MT. EBBWILL
South of Lake Wakatipu

4 1/2 x 3 1/4, 100 per cent, X2

Lake Manawapouri, New Zealand

Auckland Harbour, New Zealand

very extensive trade”¹¹² in ‘Ace of Spades’ playing cards, a line with which, in New Zealand at least, his name was by then associated:

As a manufacturer of Willis’ New Zealand playing cards - trade mark “Ace of Spades” – the house is widely known in all parts of the Colony, a special machine being employed in this department of business, which is claimed to be the only one in the Southern Hemisphere.¹¹³

In *Typo* R.C. Harding had noted in 1889 that the cards, which he mentioned were “equal to any imported,” sold for “1/- per pack.”¹¹⁴ A box of midget cards that has survived from the 1880s bears both the label “New Zealand Playing Cards” and the imprint “A.D. Willis Manufacturer, Wanganui, N.Z.” on the outside, and besides the pack of cards within, there is the extra ‘advertisement’ card. Willis never lost an advertising opportunity. From this rather hidden source, clues can be gleaned as to other ephemera produced by Willis, such as the fact that he printed food labels and calendars:

A.D. Willis, wholesale and retail, Bookseller, Stationer, fine art lithographer, and general printer, Wanganui, N.Z. | Manufacturer of playing cards, Calendars, N.Z. Xmas cards, Ball programmes, &c. | Every description of fruit and other varnished labels, unsurpassed in Design and Execution at moderate prices.

The jacks kings and queens of the playing cards were neatly chromolithographed in four colours - red, yellow, blue and black, with some overprinting of blue over yellow to give a dark green, while the suits were in the appropriate single colours red and black. The New Zealand element came with the Joker: for this card, the image of a Maori warrior was used printed in red, black and yellow.¹¹⁵ (Plate 27.)

Food Labels

Along with a number of other New Zealand colour printers who printed food labels, A.D. Willis produced, not only fruit labels, but a variety of colour-printed labels for tinned meat for Mitchell & Richards, a company of meat canners located in Wanganui, and others for the West Coast Meat & Produce Export Company Limited which was at Patea, not far to the north. The port facilities offered by the Wanganui River were a vital factor in allowing a local export industry such as this to flourish, and canning of meat was a viable way of getting such New Zealand produce to distant markets especially before refrigeration on ships. In fact, the efficacy of canning was an important factor that allowed the establishment of an export meat industry in New Zealand, producing what was to become a top export commodity on which the New Zealand economy would depend for a great proportion of its overseas earnings for a long time to come. Some of the labels printed by A.D. Willis have been themselves preserved in the ‘Ephemera’ collection at the Alexander Turnbull Library, examples being labels for tins of ‘Boiled Beef’ and also for ‘Brawn’ printed for the Patea company, and those for tins of ‘Ox Tongues’ for Mitchell & Richards. On the latter label, underneath directions for opening, was printed a key assurance to the customer:

Great pressure is used in tinning the meat, so that when turned out on a dish it cuts firm and close to the grain, and all the nutritive qualities are preserved. It will keep fresh in any climate for any length of time.

The label printing is an example of the business brought to the local area as a spinoff from the canning industry. The labels from A.D. Willis were lithographed in several striking colours, including light and dark yellow, tomato red and teal blue, with black used for the Victorian border motifs. A view of New Zealand appropriate to the locality was printed in a rectangular space, in this case, the ubiquitous Mount Egmont. Under magnification it could be seen that the greens had been produced by the overprinting of blue on yellow, with the black outline drawing and label words printed last, giving contrast, definition and added boldness to printing which primarily was intended to catch the eye. The imprint "A.D. Willis, Wanganui, N.Z." appeared at the bottom of these glazed labels. As was common at the time for such jobbing printing, the label chromolithography was economically done by using three colours plus black. However, from the basic red, yellow and blue, Willis also produced some unusual shades and tones to give a more artistically decorative effect to these everyday throw-away items. Willis' meat labels were handsome.¹¹⁶ (Plate 28.)

For the Wanganui canners the basic chromolithography was carried out in a similar way, although the scenes depicted were of sailing ships on the Wanganui River, as well as a small view of Mt Ruapehu, the other notable mountain visible from Wanganui. This view is flanked by typically New Zealand palms, the cabbage tree and the punga. A.D. Willis never lost a new opportunity to advertise images of New Zealand in a promotional way, and fully appreciated the power of the visual in commerce.

Prints

The early viewcards were forerunners to the larger views marketed by Willis in the later eighteen eighties. They were advertised in the July 1888 issue of *Typo*: "...Large views of all the Principal Towns of the Colony in nine printings 1/6 each." It appears that the production of chromolithographed prints of New Zealand views, including views of

Plate 27: 'Midget New Zealand Playing Cards'. Size: 58 x 43mm.

Chromolithographed and published by A.D. Willis, Wanganui [1880s].

By permission of the Alexander Turnbull Library, Wellington, N.Z., Drawings and Prints.

Ref. No.: Curios-006-017

Plate 28: Chromolithographs on food labels (109 x 344mm):

1. 'New Zealand Boiled Beef' and 'New Zealand Brawn': West Coast Meat & Produce Export Co Ltd., Patea

2. 'Ox Tongues': Mitchell & Richards tinned meats, Wanganui

Printed by A.D. Willis, Wanganui, 1890-1920.

By permission of the Alexander Turnbull Library, Wellington, N.Z., Ephemera Collection.

Ref. No.: Eph-F-MEAT-Gear-046.

WEST COAST MEAT & PRODUCE EXPORT CO. LIMITED.

PATEA, N.Z.

NEW ZEALAND

BOILED BEEF.

WEST COAST MEAT & PRODUCE EXPORT CO. LTD.

PATEA, N.Z.

NEW ZEALAND

BRAWN.

MITCHELL & RICHARDS.

TINNED + MEATS.

WANGANUI

NEW ZEALAND

POX TONGUES.

Prepared by **MITCHELL & RICHARDS.**

NEW ZEALAND

DIRECTIONS FOR OPENING.

Cut below the rim at top of tin, then make a hole in the bottom, and the contents will slide out.

DIRECTIONS FOR OPENING.

For the convenience of the customer, the tins are packed in boxes of 12, and the contents will slide out.

LIST OF MEATS.

BECK
BEEF
BUTTER
CORNED MEAT
CORNED STEAK
CORNED VEAL
CORNED HAM
CORNED BACON
CORNED LIVER
CORNED KIDNEY
CORNED TONGUE
CORNED HEART
CORNED LUNG
CORNED PANCAKE
CORNED RICE
CORNED POTATO
CORNED CARROT
CORNED TURNIP
CORNED BEETROOT
CORNED CABBAGE
CORNED BRUSSELS
CORNED CAULIFLOWER
CORNED PEAS
CORNED LENTILS
CORNED SOY BEANS
CORNED PASTA
CORNED MACARONI
CORNED SPAGHETTI
CORNED RICE
CORNED POTATO
CORNED CARROT
CORNED TURNIP
CORNED BEETROOT
CORNED CABBAGE
CORNED BRUSSELS
CORNED CAULIFLOWER
CORNED PEAS
CORNED LENTILS
CORNED SOY BEANS
CORNED PASTA
CORNED MACARONI
CORNED SPAGHETTI

NOTE: ALL MEATS ARE TINNED.

some of the towns and cities, had been a project set for William Potts not long after he had begun work as Willis' chromolithographer. One of the earliest of these prints was, not unexpectedly, of Wanganui, the chromolithographs being 24 x 20 inches in size¹¹⁷ and were first lithographed in December 1883. This may have been the first townscape to have been colour printed in New Zealand. Although the colours in the probably 1885 copy, 'Wanganui in 1883' (10.7 x 17.2 inches)¹¹⁸ held in the Turnbull Library have faded, it is recognisably typical of A.D. Willis' views of New Zealand, a set of which were eventually published in 1889 as the illustrations in the large well-known book *New Zealand Illustrated*, by Edward Wakefield. The prints in this book are all about the same size at around 14.5 x 6.5 inches. Archibald Willis, as printer and publisher, wrote the preface to this book emphasising the need for reliable information concerning the colony:

The frequent and very natural enquiry for reliable information respecting a young and interesting colony like New Zealand, has induced the Publisher to issue a series of pictures of its various centres of population, which he trusts will possess sufficient merit to receive public approval. Particular attention has been bestowed on the views which faithfully depict most of the cities and towns, with their picturesque harbours and rivers, eliciting such admiration and flattering mention of their beauty from the large number of visitors to the colony. The collection of the various views has been attended with some difficulty, and while the Publisher regrets the omission of one or two places that would have been of interest, he has to plead as his excuse the impossibility at present of getting suitable drawings or photographs....the Publisher has also to thank those photographers who at some trouble and inconvenience photographed the views from which the pictures have been taken, and kindly placed them at his disposal.¹¹⁹

Each of the townscapes has in the bottom left-hand corner, "W. Potts, Lith.", in the centre "A.D. Willis, Lithographer, Wanganui, N.Z." and in the right-hand corner the name of the photographer of the view on which the keystone for the eventual chromolithograph had been based. For example, the photograph by J. Martin had been used as the basis for the print 'Auckland Harbour, N.Z.'

These townscape prints were mostly chromolithographed in a similar style, being judiciously overprinted to retain clear colours and a light atmosphere, with the key in a chalk-style. It is notable that register is good. As was seen in the examples 'Wanganui in 1883' and 'Wanganui, N.Z.' (1889), the order of printing was the usual one—the lighter colours were printed first, grading to the darker colours, with overprinting creating still other colours. Magnified examination showed that the basic nine colours employed to print both these chromolithographs were pale blue, grey-blue, grey, yellowy green, pale brown, tan, dark brown, black and silvery white. The use of the yellowy green is true to the New Zealand environment, where such greens abound. Details in the 1889 townscape of Wanganui published in *New Zealand Illustrated* are slightly different to the earlier Turnbull print version, demonstrating that improvements and alterations were sometimes made over the years, so that sometimes more than one version of a similar view exists. (Plate 29.)

By the time the chromolithographs for *New Zealand Illustrated* were produced, A.D. Willis had been publishing views as prints in large and small formats for several years, and William Potts had honed his style. From the difference in size from the original 1883 chromolithograph it is probable that the copy of the Wanganui print held in the Turnbull Library was printed in 1885, although the bottom right hand corner edge trimming cut has partly obscured a figure, which could be either a 3 or a 5 in "W. Potts / 8?" This particular version of the print depicts flax in the foreground, (taken out in the 1889 version), does not depict Mt. Egmont in the distance (is shown in 1889), and has less impressive sailing ships on the river than the later version. Other alterations to the essentially same views are some of the sky and cloud effects, the shadow treatment, and the numbers of stems on some of the foliage.

Several versions of views entitled 'City of Wellington' also exist, one of which was signed in 1885 by William Potts, and bears the note:

Specimen submitted to the Hon. Col....so that he can say if he considers it of sufficient merit and comes up to representations made by Mr. Willis in his letter January 17th 1885 as this is the arrangement on which payment was to be made. Mr Willis accepting the wish of the Col. [signed] J.H. 5.8.85.¹²⁰

This 15.8 x 20 inch chromolithographed panorama is a view from the slopes of Tinakori Hill, overlooking Thorndon, and includes a number of landmarks such as St Mary's Catholic Church and the wooden Government Buildings. The note is an indication that specimen lithographs were sometimes prepared for approval before the client was committed to purchase. The view "City of Wellington, N.Z." that appears in the 1889 publication, based on a photograph by Wigglesworth & Binns, was printed in yellow, pale blue, white, grey, pink, pale orange, brown, dark brown, and black, with green formed by overprinting in the usual manner. The prints in this volume bespeak a sure-handed chromolithographic artist.

Another print probably published by A.D. Willis in the early eighteen eighties is a chromolithographic view of the White Terraces.¹²¹ This around 13.8 x 41.7cm. item is thought to be an earlier (undated) version of 'White Terraces, Rotomahana, N.Z.' which was later published as one of the illustrative set of 1889, by which time both these and the Pink Terraces that were also in this vicinity had been destroyed by volcanic eruption. The possibly late eighteen seventies or early eighties view depicts only two people standing on

Plate 29: 'Wanganui, N.Z.' (1889).

Published by A.D. Willis in 1889 in *New Zealand Illustrated*, by Edward Wakefield.

Lithographer: William Potts.

By permission of Victoria University Library, J.C. Beaglehole room. Reference, DU412 W147 N.

W. & A. G. 1871

W. & A. G. 1871

one of the lower terraces, whereas there are more people in the later view which was chromolithographed by William Potts from a photograph taken by C. Spencer to show an extensive side-view of the famous terraces. By the eighties, the location had been much visited, photographed and painted by such artists as Charles Blomfield, Charles Barraud and John Backhouse. Held in the Turnbull Library, the early untitled chromolithograph of the White Terraces scene, showing the view from a similar angle to that depicted in Willis' 1889 print, had also probably been based on a photograph. However, this particular copy has been mounted in a gold cardboard frame which obscures any signatures that may be at the bottom. It has been colour-printed using the basic colours grey, brown, white, yellow, and two blues.

As mentioned, reference to these as single prints that were suitable for framing, that by then were available from bookshops in many towns, had been made at least by September 1886 in a *Wanganui Chronicle* report. The high standard of Willis' reproductive work is pointed out:

Amongst these pictures there is a vivid copyrighted representation of Mount Tarawera itself while in eruption. This work is impressive in a high degree, and it and its companion pieces will assuredly not lower the status of Mr Willis as a fine art publisher of well-earned colonial repute.¹²²

In addition to the prints of the Pink and White Terraces, The Tarawera eruption print was also later included in the *New Zealand Illustrated* set of prints, the 1889 chromolithograph showing that the print had originally been reproduced from a painting by Charles Blomfield, who had arrived from England in 1863. This artist had made painting visits to the pink and white terraces in 1876, 1883 and 1884.¹²³ Thus the 1886 print was probably one of the earliest full colour prints to have been produced in New Zealand that was reproductive of an original painting. It was produced around a year before 1887, the year which has previously been postulated as that in which the first New Zealand colour lithograph made after a painting had been produced.¹²⁴

Beside the views and townscapes, A.D. Willis published single prints chromolithographed by William Potts with subjects other than views, for example two with a Maori theme being the 35 x 50cm. 'The Latest Scandal!' ¹²⁵ from around 1890, and the historical 'Death of Major Von Tempsky at Te-Gnutu-o-te-Manu. New Zealand, 7th September, 1868' ¹²⁶ which, as mentioned, was published around 1893. In sombre tones of brown, grey and black, the former print bears the signature "WP. Lith." at the bottom, and was from a work probably by George Sherriff, a Wanganui artist of the time ("G.S. del"). Depicting a group of Maori women outside a whare listening to an elderly woman member relating the latest scandal, the underlying dusky pink infuses the composition with warmer tones in the lighter portions

of the composition, for instance, the sky, some of the women's garments and the whare walls. Close examination shows that colour shading has been executed in regular patterns: this print is of a different character to Potts' earlier view prints, and indicates that he was employing a style that was in keeping with overseas chromolithographic trends towards the use of semi-mechanical textures in regular patterns. The reproductive 44.8 x 62.8cm 'Death of Major Von Tempsky' is from an oil painting by Kennett Watkins: "K. Watkins, copyright" appears on the bottom of the chromolithograph which is signed by the chromolithographer as "W.P." "A.D. Willis, Lithographic Printer, Wanganui, N.Z." is also printed at the bottom. Gustav Von Tempsky, a Prussian-born soldier, had followed the call of the gold-fields, arriving in New Zealand via San Francisco and Australia in 1862.

Reading Matter: Books and Periodicals

Almanacs and Other Periodicals

In 1879, as reported in the *New Zealand Press News and Typographical Circular*, the jobbing trade in Wanganui had been in a healthy state, and the almanacs, which were in the nature of annual periodicals were coming off the press. Such publications, brimming with information, were basic sources in the colonial situation, and, like jobbing printing, would have been expected to find a ready market, and hence to provide sure revenue for the printer.

Wanganui, December 19.—Trade is brisk just now. The two jobbing offices are fully employed, and the newspapers have enough to keep their men going. Two book almanacs saw the light of day this week; one from the office of Mr. A.D. Willis, and the other from that of Mr. H.I. Jones. Both books are very well printed, and are replete with useful information. It is the intention of each of the papers to issue a sheet almanac as a New Year's supplement.¹²⁷

Willis published the *Wanganui Almanack and Directory* from around 1873 to 1882. Such staples as almanacs and jobbing printing not only brought in revenue, but also acted as a springboard to other book publishing, an area in which Willis was to make further forays into colour printing in the later eighties. In the following year, 1880, when the same trade journal, now entitled the *Colonial Printers Register*, announced that the Wanganui almanacs were again available, they were judged "very creditable specimens of that kind of work."¹²⁸ Special mention was made that Willis' almanac contained maps of the North and South Islands showing the routes of coastal steamers. Willis' almanac had included graphics for some time: on the title-page the 1877 almanac had included an oval view of sailing ships on the Wanganui River, a feature that still appeared on the 1882 title-page. In the preface to the 1877 edition, from the perspective of the task of compiling the almanac, Willis' had commented on the rapid growth of the town of Wanganui. He said that, over the fourteen years that had passed since the almanac had begun as a small publication, "the rapid manner

in which the districts surrounding Wanganui have been populated, has rendered a full and complete list of the whole of the settlers, a work of considerable difficulty.”¹²⁹ The ‘Trade Directory’ section that year listed A.D. Willis as a “bookseller and printer, Victoria Avenue”; and his private residence as “Bell Street”.¹³⁰ In the section, ‘Wanganui Advertisements’, Willis’ own advertisement listed his activities as “bookseller, stationer, news-agent, lithographic and general printer (publisher of the Wanganui Almanack), Caxton Buildings, Wanganui.”¹³¹

However, such a population increase also meant a potential increase in the market for print products, and it is telling that it was soon after this period, in the early eighteen eighties that, judging the time to be opportune, Willis had expanded his business and added the chromolithographic arm. By 1882, on page six in the almanac, was Willis’ own advertisement that read “A.D. Willis. Letter-Press and Lithographic Printer, Bookseller, Stationer and News Agent, Victoria Ave., Wanganui.” As yet there was no mention of the colour printing that was to be given such prominence later in *Typo* advertisements in those that began to appear in the the *Freethought Review* of 1883: it is to be recalled that William Potts had probably not arrived before 1883. The relatively short-lived *Freethought Review*, also printed and published by A.D. Willis, was itself unillustrated, perhaps because it was published on a shoestring.

However, in 1880 a previous exploratory enterprise had involved the production of popular graphics. This had been announced in a report published in the early January issue of the *Colonial Printers Register*: “WANGANUI, December 31....*On dit* that a monthly comic journal is to be published in Wanganui, by Mr. A.D. Willis.”¹³² The January 31st issue duly announced that “the *Comic Annual* made its appearance on Monday last.” Although the frequency seemed in dispute, and the name of the journal was not mentioned, a year later Willis did publish the first number of a monthly comic entitled *The Taniwha*. In the February 1881 issue of the *Register*, however, under the heading ‘Topics of the Month—New Zealand’ its appearance was noted with distaste: “There is nothing in it worthy of mention—not even the get-up.”¹³³

Be that as it may, by now Willis was moving into graphics printing and about this time, was preparing to diversify into a range of formats, all of which contributed to a widening experience of the field. However, it was to be for the chromolithographed views, particularly the townscapes, that Willis was to achieve distinction in the more challenging and competitive field of book illustration. It was for these illustrations that some of the most

ambitious chromolithography was to be executed later in the eighteen eighties. In retrospect this can be seen to be the same period by which another New Zealand chromolithographic firm of the Lower North Island, Bock and Cousins of Wellington, had reached their colour printing zenith. For Willis, the period of successful colour printing that began when the English chromolithographer William Potts joined the staff included some production of book illustrations that were printed in colours.

Booklets

Examples of booklets printed and published in colour by A. D. Willis that are held at the Whanganui Regional Museum are the titles *Tiki's Trip to Town* by James Duigan, and *Under the Southern Cross* (1890) both with sketches by G.S. The latter is a book of scenes, printed mainly in greys, but with the effective use of white printing for example to highlight the snow on a view of Mount Egmont. The booklet *Tiki's Trip to Town* is a series of pictures with a prose text by James Duigan at the back entitled 'The Adventures of Tiki' and several illustrated poems, the subdued colours used for the illustrations being printed in a blue-grey shade. The cover design for this item also is in blue-grey with silver-grey lettering added. This was really an early New Zealand children's picture book, the subject of the story at the back, Tiki, being a lineal descendant of the original tiki, who, according to Maori legend was the first man. It is notable that of the fifty-one books of New Zealand junior fiction to 1914 cited in Betty Gilderdale's bibliography,¹³⁴ fourteen were from Australasian publishers, and these included two published by A.D. Willis. The first was *Tiki's Trip to Town*, estimated to have been published in 1893, and *Tregurtha Abbey and Other New Zealand Tales* by Lt. Col. McDonnell and Hinemoa (pseudonym), published in 1898, was the second. The latter was not illustrated.

In fact *Tiki's Trip to Town* had come only two years after the appearance in 1891 of what was probably the first children's book to be published in New Zealand, Edward Tregear's collection of stories entitled *Fairy Tales and Folklore of New Zealand and the South Seas* which was published by Lyon & Blair of Wellington.¹³⁵ Although the colour printing for *Tiki's Trip to Town* could be considered dull by comparison with the colour printing for most modern children's books, this modestly produced early book nevertheless represented the effort to bring colour, that element so desired by children, to this segment of what in New Zealand was still a small market overall, and for which that small size acted as a limiting factor, especially for more costly colour-printed productions. As stated by children's book authority Mary Attwood "in 1890 New Zealand children were wholly reliant on imported books for leisure reading." The 1893 picture book from A.D. Willis, produced

in what was probably William Potts' last year, was a pioneering New Zealand publication with regard to the attempt to provide colour-printed illustration in this area of publishing. It can be seen as having taken a step forward for locally produced children's books in a climate where, "if included at all, illustrations were limited in scope and achievement," and where talented New Zealand illustrators were often finding it necessary to travel overseas to obtain work.¹³⁶

One Christmas card in the Wanganui archive bearing the words 'Compliments of the Season' features a printed design in brown and gold on an aqua ground, with a portion left in white for a hand-written message. Willis also had developed this card into a booklet to be a more elaborate form of seasonal greeting. Using the same design for the cover, the booklet of poems by Benoni White was entitled 'Titbits from Maoriland, with Compliments of the Season'. A proof for the cover/card is also extant. The booklet, made special with a fancy cut edge, was dedicated to Lady Plunket and dated September 1904. On the inside, opposite each poem a central view was printed in tans and browns in an oval frame, surrounded by designs combining natural and Maori motifs printed in blues on a light blue ground, the colour scheme being a reverse of that used on the front cover. (Plate 30.)

View-books and Guide-books

By the eighteen eighties, chromolithography had been well used overseas to add colour to the fashionable view-books to provide what Anne Kirker has termed "luxurious illustrations."¹³⁷ Up until the mid-eighties A.D. Willis had been involved in book publishing only in a small way, and a few unillustrated items had appeared, such as *He Peka a Te Kowhai = a Branch of the Kowhai, or A Help to the Pronuciation of the Maroi Language* (1870), which had been printed by Ballance and Willis at Campbell Place. Since at the time printed books imported into the colony were exempt from duty, caution in local publishing was well justified, and careful gauging of the market was called for under such competitive conditions. By 1885 Willis had published some modest books at the Caxton Works, including *Songs of the Singing Shepherd*, and, as already mentioned, *Illustrated Guide to the West Coast of the North Island, N.Z. Describing the Various Towns and Adjacent Land Aavailable for Settlement, &c*, by R.W. Pownall, who was also both an artist and a musician, and who had come to Wanganui from Nelson. The *Illustrated Guide* appeared in 1885 with nine plates and a frontispiece which had been lithographed by W. Potts in black and white after sketches by Pownall. This book was the first illustrated guide to a particular region to have been printed in New Zealand.¹³⁸ George F. Allen's *Willis's Guide Book of New Routes for Tourists* appeared later,¹³⁹ around 1895—entries in Allen's diary for 1894

give both an account of his ascent of Mount Ruapehu with Willis, and, from the 8th July that year, of his progress on the writing of “the guide-book”. For instance, Allen had noted on 24th August an appointment with Willis, “re pictures suggesting Ads. in Local papers (G.B.)”¹⁴⁰

Further books had appeared from the firm of A.D. Willis in the later eighties, and this was the period in which, for some, colour-printed illustration was provided. Thought to have been published in 1887, the undated *Hinemoa*, a poem by Eleanor Montgomery, contained sketches by G.S. but which were still in black and white. However, in that year the lithographic illustrations that were produced by William Potts for two other books were printed using colour. One of these works, A.D. Willis’ own book, *Interesting Chapters From the Early History of Wanganui, 1847; and Wanganui in 1856* contained two plates following the contents page, both lithographs in ‘landscape’ view printed in two tints. The style was similar to the early New Zealand tint lithography used in the sixties to colour the illustrations for the *Southern Monthly Magazine*. (See Section II.) Both lithographs in *Interesting Chapters*...have had a buff-yellow tint added to a basic black and white chalk-style lithographic image, from a stone on which the white highlights had been scraped out. The first, entitled ‘Town of Wanganui in 1887’, shows the town extending along the river which had by then been bridged, the construction of the bridge having been one of the first important works constructed in the late 1860s. This contrasts with the second, ‘Town of Wanganui in 1847’ when the town had consisted of only a few buildings, with a fenced stockade on the hill. The fact that this book had appeared illustrated with two lithographs was noted in *Typo* in October 1887.¹⁴¹ A second edition of this book was published in 1902, again with the tinted lithographs.

For the other 1887 book the colour-printed illustrations were in full chromolithography, but this time the book had not been published by A.D. Willis, and was not a view book, but rather the more practical text *An Account of the Insects Noxious to Agriculture and Plants in New Zealand*...by W. M. Maskell, for which A.D. Willis had been contracted by the Government Printer to print the illustrations in colour. (See Below: Other Publications.) In the following year of 1888 the small sixpenny guide book *Geysers and Gazers: Or a Trip Through the Boiling Springs Districts of New Zealand: The Wonderland of the World: Adventures and Experiences Graphically Described* was both printed and published by

Plate 30: ‘Titbits from Maoriland, With Compliments of the Season.’

Published by A.D. Willis.

By permission of the Whanganui Regional Museum, Archives.

Ref. No.: A.D. Willis Papers.

Dedicated (by permission)
to LADY FLUNKET.

First
Books
of
the
New
Zealand

Library

With Compliments of the Season

By
Benoni White.

WILLIAM LESTER WANGANUI

First
Books
of
the
New
Zealand

Library

With Compliments of the Season

Willis. Written from the point of view of "the ordinary experiences and observations of a tourist" Willis explained in the preface that the aim of the book was to "add to the enjoyment of the traveller and induce others to travel..." However, the price did not allow for a chromolithographic production, rather all decorations in the form of headpieces, tailpieces, decorated initials together with the occasional wood-engraved vignette, were printed entirely in relief black and white.

As stated, 1889 saw A.D. Willis' colour printed view book *New Zealand Illustrated: The Story of New Zealand and Descriptions of its Cities and Towns by Edward Wakefield; Also (by Various Writers) The Natural Wonders of New Zealand (Past and Present)* printed and published at Caxton Buildings, Wanganui, in which, in the preface, Willis noted that he had proceeded with the project to publish such a book locally because of "the frequent and very natural enquiry for reliable information respecting a young and interesting colony like New Zealand..." This was an entirely more ambitious production than any he had embarked on before. Of the fifteen plates, fourteen were chromolithographed by William Potts, and the other was in black and white. Apart from the original for 'Tarawera in Eruption, June 10, 1886, June 10, 1886 (From the Native Village of Waitangi)' by Charles Blomfield, all but one of the colour plates were based on photographs by acknowledged photographers, the exception being the reworked plate 'Wanganui, N.Z.' Commenting that "most of the plates are familiar, having been published separately from time to time as a uniform series," R.C. Harding announced in *Typo* that they were now available in an "oblong folio volume."¹⁴²

Beside the tranquil views of towns and cities (discussed in the section 'Prints'), 'Mount Tarawera in Eruption' which had been on sale as a print at least since September 1886, three months after the eruption, provides a contrast of style. For the 1889 book, a five-page text 'The Eruption' accompanies the plate which is a foldout reproduction of the painting by Blomfield, the London-born self-taught artist who had become one of the leading professional artists of New Zealand. Potts' 24.5 cm. x 50.5 cm. lithograph depicting the dramatic eruption, is portrayed in strong colours to reflect the artist's "strong detailed style."¹⁴³ As the chromolithographer had committed it to the stone the scene was built up by dense overprintings of yellow, brown, black, deep greeny-blue and bright orange, the latter formed from printing red on the yellow. The whole effect is one of great contrast: of a dark night lit up by enormous flashing eruptions (in yellow and orange) showing steam, whares and fleeing people caught in the orange light, all portrayed starkly against the shadows. (Plate 31.) The other plates that were not townscapes were 'The Waitomo Caves' triptych (in black and white) from the photographs by Haana, of Auckland, as well as the views

from the photographs by C. Spencer of the pink terraces, and of the white terraces, both shown as they had been before the eruption.

The chromolithographs of the towns and cities of New Zealand, in the order that they appear in *Willis' New Zealand Illustrated*, together with the photographers of the views on which they were based, are as follows: (Each title has the suffix 'N. Z.')

Title	Photographer
Auckland Harbour	J. Martin
Napier	S. Carnell
City of Wellington	Wrigglesworth & Binns
Wanganui	None stated
New Plymouth	Collis
Nelson	W. Tyree
Greymouth	J. Ring
Lyttelton Harbour	E. Wheeler & Son
City of Christchurch (from the Cathedral)	E. Wheeler & Son
Oamaru	E. Wheeler & Son
Dunedin	Burton Bros.

According to Harding's note in *Typo* at the time, Willis' lithographic views had been highly commended both in the colonies and at home: it was predicted that the new book would sell well. This was a tribute to the publisher, as R.C. Harding was of the opinion that "a well-printed book is more difficult than any kind of job-printing; the chances of error are infinitely greater, and successes are much more rare."¹⁴⁴ The decoration of the pages of *New Zealand Illustrated* was described by Harding as being bordered "with a rule in red, with light corners and centres of German design, ... an ornament in red appears in place of a column rule." The plates of the Waitomo Caves, are noted as being copied from three photographs. "Two of these represent the 'blanket' stalactite – a unique formation, so exactly simulating folds of drapery, even to a colored striped border following the contour of the edges, as to deceive the eye at a distance of twenty feet"¹⁴⁵; examples of natural trompe l'oeil. A facsimile edition of this book was published in Wellington in 1981 by Price Milburn and Company Limited, for the Gondwanaland Press. (See also: Prints)

Other Colour-Printed Books

The Government Printer is known to have out-sourced colour printing to Willis, for instance for the twenty-three plates, most of which were colour printed, for the book *An Account of*

Plate 31: 'Tarawera in Eruption, June 10, 1886 (From the Native Village of Waitangi).'

Chromolithographed by William Potts after a painting by Charles Blomfield.

Published by A.D. Willis in 1889 in *New Zealand Illustrated*, by Edward Wakefield.

Reproduced from the 1981 facsimile edition published by Price Milburn and Company Limited, Wellington, for the Gondwanaland Press.

By permission of Hugh Price.

From the Aliso Village at Taupo, Lake Taupo. 23

the Insects Noxious to Agriculture and Plants in New Zealand. The Scale Insects (Coccididae) by W. M. Maskell, F.R.M.S., Registrar of the University of New Zealand. This production was mentioned by Harding in the November 1887 issue of *Typo* under the heading 'New Books'. Its timeliness was attributed to the fact that until a few years previously New Zealand was "almost exempt" from pests, but that they were now inhabiting every garden and orchard. Harding recommended the book to all gardeners, saying that it was the most thorough treatment of the subject of scale insects yet, and, as mentioned, paid knowledgeable tribute to the skills of A.D. Willis' lithographer, William Potts.

Twenty of the twenty-three plates were in colour, and were based on drawings by William Maskell, an entomologist whose book was a consolidation of twenty seven papers he had previously had published in the *Transactions* of the N.Z. Institute, for which some colour illustration had been carried out. An extensive review appeared in the August 19th 1887 issue of the *Wanganui Yeoman*:

The work has been printed by the Government Printer with the exception of the colored plates, which have been most artistically lithographed by Mr. A.D. Willis of Wanganui. These plates are faithful reproductions of Maskell's colored drawings, which Mr. Potts has copied with great skill and fidelity. The work is a valuable addition to the catalogue of New Zealand works on scientific subjects, and will prove of great value to entomologists and those who take an interest in botany. The ravages committed on plants by the insect pests are heavy and costly, and Mr. Maskell's book will be welcomed by every intelligent horticulturalist, as it contains not only a purely scientific description of the scale insects coccididae which infest the plant life of the colony, but a specially valuable chapter on the remedies to be applied to this ever increasing source of loss and annoyance. Maskell gives a specially valuable list of plants and the coccididae attacking them, by the aid of which those interested may, by a reference to the description given and the plates, of which there are XIII, speedily identify the particular member of the scale insect family which is committing havoc among their trees and plants...the scale family whose name is legion, judging by the list in the book before us...[the book] is supplied to the public at the very moderate price of five shillings per copy by the Government Printer from whom it may be procured postage free.

Further details given in the review concerning the production of this book have shown that in 1887 Mr. Clarke was still employed as a lithographer at A.D. Willis, and was working with William Potts at the time:

It is a most creditably compiled work, and has been turned out in the best style typographically, being printed on good paper, from excellent type. The illustrations, as before mentioned, are works of art and reflect the greatest credit on Mr. Willis and his employes (sic), and show conclusively that there is no need to go beyond the colony for such work, which is quite evident can be done as well in Wanganui as in London. Now that this has been demonstrated we hope to see other work of the same kind sent here for execution, as Messrs Potts and Clarke have proved that they can do it in a manner which is deserving of the highest commendation...¹⁴⁶

Examination of the book shows that each plate consists of several drawings with descriptions on each facing page. Some have been lithographically coloured in clear tones, with shading added in black or dark green. Most colouring consists of a single colour on white: it is informational colour added to a black key drawing and is simple, effective chromolithography. Some overprinting of from one to three colours was used to produce,

for instance, an orange-brown insect on the back of a green leaf. For example, plate XI 'Lecanium sp.' has been produced in six printings to build the colour for figures 1-5 from black, light and dark green, orange, yellow and brown, with overprinting, for instance of orange over yellow in figure 5d, 'Female of Second Stage, Dorsal Aspect,' giving a further shade. This is typical, another example being Plate XIV figure 2, showing insects on the bark of the *Hoheria*, in black, pink, blue, yellow, orange, and light and dark grey, with pink over yellow giving a further salmon shade. In this book, the layout has been designed well and the colour has enhanced the informational value, with the light/dark aspects and colour contrasts contributing to an altogether pleasing presentation. (See also chapter 9 for a discussion of the scientific value of the element of colour in printed images.)

Harding observed that "no private publisher would have undertaken the risk of producing so complete a book"¹⁴⁷ at that time, indicating that the role of the Government Printer was the factor that had enabled such a colour-printed work to have been printed locally. This was a practical book, published for the farmer, the gardener, the fruit-grower, and the owner of pleasure grounds, as mentioned in the text, all of whom needed to accurately identify their scale insect infestation before proceeding with the appropriate means of eradication. Knowledge of the colour of the insects was integral to such identification, and the subject of enough importance for even the Government Printer to justify the extra costs of colour printing. That the book was necessary particularly for New Zealand conditions was made clear:

Many of the Coccididae are destructive to vegetation in the warm temperate regions...For its extent New Zealand seems to furnish a larger number than any other country...there is scarce a tree in its forests or in its gardens, whether native or introduced, which is not subject to their attacks.¹⁴⁸

Soon after, in 1890, a book by the professional surveyor H.C. Field entitled *The Ferns of New Zealand and its Immediate Dependencies with Directions for their Collection and Cultivation* was printed and published by A.D. Willis, again lithographed by William Potts. The purpose of this book was similarly informational, this time for the layperson to identify the profusion of ferns they were encountering in their new environment, a group of plants for which the Victorians had developed a fascination. However, as explained in the introduction, the need for such a book was pressing because "the straitened state of the colonial finances has, thus far, prevented the issue of a second edition [of Dr Hooker's *Flora Novae Zelandiae*] revised and completed to the present time."¹⁴⁹ Although *The Ferns of New Zealand, Collected, Dried and Named by William Swainson* had been published in Wellington by the author in 1846¹⁵⁰, Hookers' 1855 work had contained the first detailed botanical descriptions of the New Zealand ferns. Another earlier popular book on ferns that

had been published in 1861 in Auckland was out of print, and a third, by G.M. Thomson, which had not sold well because it had initially been priced too high, contained descriptions that were "too scientific for ordinary people." The author, Henry Field, stated:

I believe, however, that the main reason why this and the hand-books have not hit the popular taste has been that a written description of a plant can hardly render it capable of identification by a non-scientific reader, unless it is illustrated by a drawing. In fact, I believe most people would identify by a drawing alone far more readily than by any mere description.¹⁵¹

Apparently, although Thomson's 1882 book was reportedly selling better since the price had been lowered, H.C. Field felt that the illustrations in that book, "being only of portions of fronds", was not adequately fulfilling its prime function of facilitating their accurate identification. Especially for the popular market, illustration was an important market driver.

But in addition, Field had fully intended his illustrations, which had the advantage of being drawn from life, to be printed in colours: previous books prepared from dried specimens would have lost the truth of the colours. That Field had a particular appreciation of, and delight in, the colours of ferns, a group of plants which might be imagined to be mainly green, is evident in his text.

In our plates, which have been drawn from actual specimens, I have given as nearly as possible the general appearance or form of each fern: for the same plant often varies greatly in different localities, and at different stages of growth. It may be noted here that, as a rule, young fronds are more brightly tinted than old ones, but the amount of light where a plant grows, greatly affects its colour. A fern, which is usually of a dark green, will often assume a golden hue when the bush in which it grows is cleared, or partially so. The young fronds too, of some ferns, present lovely shades of rose, purple and orange; the veins sometimes being of a different colour from the web of the frond. The colours die away as the frond attains its full development and hue, and they cannot be preserved by drying. They seem to depend on the soil, the young fronds of the same species differing in colour in different places. Limestone soils appear to produce the brightest colours.¹⁵²

With an eye such as this for the colours of ferns, and knowing that the demonstration of the colours was an aid to their identification, Henry Field had based the whole plan of the book on the colours to be found in ferns, and was keen to bring out this aspect, having anticipated the illustrations would be so printed. The fact that the use of chromolithography for their illustration was ruled out as being too great a market risk must have been a great disappointment. It was felt by Willis that the cost would put it beyond its intended ordinary readers: the recent example of Thomson's book would have been a cautionary case to the prudent publisher. Field explained in the chapter 'Classification of Ferns':

Probably some of my readers will wonder that, as the descriptions of the ferns follow each other in regular order, according to their classification, the plates and figures on them are not arranged in a similar sequence. It may be well therefore to explain, that my first intention was to print the ferns in their natural colours, and they were arranged according to those colours. It was found, however, that to produce such a work would make the book too costly for ordinary readers; and as my object in writing it has been to popularise the study of the New Zealand ferns, by enabling non-scientific persons to identify them, I had to content myself with a style of lithography which, though new and of a high class character, is less expensive; and to mention the colours in the descriptions.¹⁵³

This Field did: the text of his book gives constant reference to colour, for example, in reference to the Silver Tree Fern, *Cyathea dealbata*, illustrated in Plate X, No 2, and Plate XXIX, No 8, he says:

This plant may generally be at once identified by the white undersurface of the fronds, though this is occasionally wanting...stipes short and only moderately stout, usually white below and green above. Rachis and costae the same, but getting gradually darker towards the top of the frond, where the latter are often almost black on their upper surface. When they first appear in spring, the stipes, rachis and costae are covered with dense brown scales which give the young fronds a dirty and unattractive appearance...This fern is very good to cultivate, and its silvery under surface makes it rather an attractive one for the purpose. What appears to be a variety of this fern has been called by Mr. Colenso "*Cyathea tricolor*". The points of difference are its rachides, being yellow above and furry below with some red scars or blotches, the bluer tint of the under-surface of the fronds, its dwarf compact form and more drooping habit of growth. It occurs on the spurs of the Ruahine mountains about Norsewood and Dannevirke.¹⁵⁴

Reading this nineteenth century book today, one can see that H.C. Field's intent to use colour illustration would have indeed been appropriate. In the end the small local market had been the factor that militated against his plan. Cost could not be balanced by the production of a large edition. The subject, the identification of the ferns of New Zealand, most of which are indigenous, and hence not found elsewhere, directed this book mainly to a local market, and a specialist one at that. Willis was rightly cautious about such a book, but could still see the market for it, and a compromise solution was found. The 29 plates, each of which is illustrative of several species of fern, instead of being produced in full chromolithography, have been neatly executed in a simplified form of colour printing in three overprinted tints—light grey for the background, mid-grey for the form, and dark grey (said by Bruce Sampson to have been shown under microscopic examination to have been printed last)¹⁵⁵ to give clarity to salient detail. As stated, photolithography was the basic process used to transfer the drawings to stone for the form impression. In some cases, for instance, for Plate X, a subtle brown has been used to pick out the veins, for example in the depiction of 3B, the "*homaria filiformis* fertile frond." The whole has been competently produced but is in all probability rather dull in appearance compared to the colour originally envisaged by Field. However, even after thus economising on the cost of producing the book, it was listed at 21s 0d, a price that made it the most expensive of the 38 books on the 'New Books' list in the March 1891 new series of the *Monthly Record* published at this point as part of *Typo*.¹⁵⁶

Other Illustrated Publications

As time went on, the rising tide of photographic images began to impinge on the illustrative content of books emanating from A.D Willis. Among the later illustrated books published from this firm were *Collotype Views of the Wanganui River* probably by G.F. Allen which appeared around 1895. The black and white collotype illustrations were produced by

Charles Spencer of Auckland, the New Zealand pioneer of this photograph-like illustration, while *Some Maoriland Beauties from Original Photographs of Feminine Types of the Natives of New Zealand* appeared around 1899, with the illustrative portraits again in black and white. The effort to publish according to changing public taste continued, but at the same time keeping costs down and standards up. A greater use of half-tone rather than the more expensive collotype processes for the printing of photographic images can be observed, and instead of increasing use of expensive colour, a transition to the employment of more black and white images can be discerned. That printed colour for books intended for the local market was by now considered unprofitable by Willis possibly may be inferred from the appearance of two books from this firm on the subject of gardening, one that would have been expected to lend itself to colour illustration. However, neither was even illustrated. John Lockhart's *An Easy Guide to New Zealand Gardening*, which was brought out in several editions to 1920, was first published by A.D. Willis around 1900,¹⁵⁷ while Emily White's *My New Zealand Garden, by a Suffolk Lady* was first printed by A.D. Willis in 1902. A second edition published by Elliot Stock appeared in 1905 with illustrative plates and a frontispiece. For books, the era of chromolithographic printing from A.D. Willis appears to have passed, although I have not carried out an exhaustive search of Bagnall's later volumes. However, colour job printing, entailing less risk, continued, as can be seen from such surviving examples as the booklets and cards described from the Benoni White period.

However, the general interest in photographic views of towns and cities continued, and by the early twentieth century, some with New Zealand content were again being published in Sydney, including one of the Wanganui region published by Fergusson Ltd. in Sydney and London, *Wanganui Illustrated; 41 Views of Town and River...* around 1902. This publication contained twenty pages of black and white illustrations, the only colour used being for the names of the local agents on the front cover—A.D. Willis (in light purple) and H.I. Jones (in blue). A book of scenes sketched by Wilhelm Dittmer, *Sketches on the Wanganui River* was published in black and white around 1905. Around 1910, after Willis' death, *Views on the Wanganui River From Photographs Specially Taken by A.A. Willis* was published by the firm, this time with twelve uncoloured plates.

Although Willis also published school books, such as *Astronomy for Beginners Who Live in the Southern Hemisphere*, by Archdeacon Arthur Stock, (second edition in 1897), he did not appear to have executed the colour printing for *Willis's Australian World Atlas* by G. Bartholomew which appeared with 34 pages of full colour maps, and for which he was

publisher around the turn of the century. However, some coloured maps and plans had been printed by the firm.

Maps

As was common practice with other local printers, A.D. Willis printed cadastral maps and plans, especially those that were part of the surveyed area surrounding Wanganui. One plan that had been lithographed by Willis around 1881 was the 39 x 54 cm. 'Plan of the Matemateaonga Block' showing settled lands in the vicinity of Patea County. It had been lithographed in black and white from the manuscript that had been autographed "A. Atkins, surveyor. Jan., 1881": the textual elements appearing in a long-hand style.¹⁵⁸ Land sale plans that had been colour printed also came from Willis, often in a simple scheme that was suited to the advertising role appropriate to their commercial function. Those colour printed maps which I have been able to examine date mainly from the early twentieth century, one being the land sale plan 'Marahau Estate' that had been printed by Willis around 1904 in black and red. For this plan, the use of red in both a solid and a stripe gave visual impact and variety, while at the same time affording the economic advantage of the need to employ only one extra colour in addition to the basic black.¹⁵⁹ A similarly printed item, the 1907 'Plan of the Durie Estate To be Known as the Durietown Extension', was prepared in black and blue. This plan, for which the surveyor had been John Annabel of Wanganui, advertised the land "to be sold by Public Auction, by Freeman R. Jackson & Co., at the Sherriff's Studio, Ridgway Street, Wanganui, on Saturday, the 16th of November, 1907, at 2pm."¹⁶⁰

That such a spare colour printing style was not invariably used for Willis' maps and plans is evident from the inspection of other similar items, such as the 57 x 78 cm. 'Plan of Marton Extension' from the same year, 1907. For this production, three eyecatching colours that were closely related to the primaries—bright pink, deep aqua and yellow—were chosen to offset the basic black. Some of the sections for sale appeared in pink and others in aqua, while reserves in green had been achieved by the overprinting of aqua over yellow. Plain yellow was used to pick out the roads while black was used both to outline the basic plan and for the textual elements. To light up the bold black heading, bright pink had been printed as an underlay.¹⁶¹

Also from the early twentieth century, the 1906 'Borough of Wanganui and Suburbs', a more elaborate item, bore both advertisements and a halftone image of the Wanganui Sash and Door Factory and Timber Company printed in black and white around the colourful map. "Printed and published by A.D. Willis, Wanganui" appeared under the scale.¹⁶² Again, both solid colours and prepared tints had been used—the roads were in yellow solid, the

reserves in cross-hatched blue over yellow to give green, and the river appeared prominently in a blue stripe that was edged with a solid blue; a style in keeping with colour maps of the time. (See also chapter 11.)

Focussing especially on the Wanganui River, a colour printed map from 1903 that had been compiled for the Wanganui River Trust by John T. Stewart confirms the fact that A.D. Willis was using photolithographic methods for map printing. At the bottom of this map were the words "A.D. Willis, Photo-Litho, Wanganui." Colour for this 75 x 50 cm. production had been overprinted on a black photolithographed map that retained its manuscript appearance and that also incorporated drawings of the river boats. By employing blue and terra-cotta in both a solid and a striped form, two shades of each colour were available to pick out such features as boundaries, the shoreline, the lake and the Wanganui drainage area. The latter, a region that covered about 2800 square miles, was defined in light orange. Although register was imperfect, this was an example of the use of simple but effective colour map printing from this firm.¹⁶³ Another existing version of this map is in black and white, while a hand-coloured copy has also been preserved. (Plate 32.)

Conclusion

Although at first he had considered the newspaper as a basis for his printing business, an area for which there had seemed to be a proven market (although one in which increasingly failures were occurring), A.D. Willis had decided instead to pursue a different path. After beginning in the area of the production of everyday stationery and bookselling, Willis built his printing business around this core, deliberately adding the art printing arm and eventually diversifying into many printed formats to bring colour to the local New Zealand marketplace and to overseas markets as well.

The overseas thrust to bring colour to the general population must have been an influence on Willis. Attuned to popular opinion, at his Wanganui Caxton Printing Works Willis had endeavoured to introduce colour to many print products, especially those that would appeal to the general populace, at first bringing out the townscape prints, and later playing cards, Christmas cards and view postcards. Other ephemeral items had included chromolithographed food labels, ornamental certificates and invitation cards. A few books with illustrations in colour had also appeared, including children's and school-books, as well as coloured maps and plans. However, even by the eighteen eighties, the small size of the local market presented a substantial risk for the publisher of books of any kind, let alone colour-printed books. Willis had gauged that the viable vehicle for colour was more likely

to be the simple card, poster, print and occasional booklet, as long as its presentation was in keeping with what the market desired.

The circumstances of the production of Henry Field's *Ferns of New Zealand* demonstrated the prudence that was necessary for the New Zealand colour printer. This book begged colour, but even though the chromolithographic expertise of William Potts was at hand, the business decision had to go against a colour production. Whether to print in colour or not had to be a hard-headed publishing decision, even in a field as appropriate as plant depiction, an area which had provided many a British printer with material conducive to colour printing. Although general interest in the subject of ferns was high, the fact that the ferns were depicted to facilitate their local identification had restricted the book to mainly a local market.

However, Willis had shown enterprise in bringing the earlier publication *New Zealand Illustrated* to the market. With its local interest townscapes, this book had taken advantage of the curiosity of the market for the new, and at the same time, of the pride of the colonial population in their achievements. Such costly ventures needed financial backing, at least from subscription sales to allow profitable production to go ahead. Willis had fostered this market by providing such 'views' singly as prints for some time. Even so, Willis does not appear to have published further such large-scale chromolithographic works, in spite of the fact that he had won the praise for the standard of this production from the stringent critic R.C. Harding. A further indication that his establishment was considered competent in the area of colour printing was indicated by the fact that the Government Printer had outsourced scientific illustrative work to him, an area in which accuracy of any colour which was printed representatively was important.

Although A.D. Willis was prudent, he was not a timid business man. The point of difference which this printer brought to the market was that he had made New Zealand images integral to a variety of his print products. Many of these images had been the basis for the addition of colour that served to both provide and highlight information about the subject matter. Willis built upon the fact that, as the fascinating New Zealand environment was being revealed, visited and fabled, the curiosity of the market had already been aroused.

Plate 32: 'The Wanganui River' [map]: 80 x 56cm. Compiled for the Wanganui River Trust, by John T. Stewart...1903.
Scale 1: 350 000.
Published by A.D. Willis, 1903.
By permission of the Alexander Turnbull Library, Cartographic Collection.
Ref. No.: MapColl 832.41cdc/1903/Acc.22710.

THE WANGANUI RIVER

COMPILED FOR THE WANGANUI RIVER TRUST BY JOHN T. STEWART 1903

DRAINAGE AREA
2800 SQUARE MILES

SOME OF THE RIVER STEAMERS

NOTE: Great attention has been paid to the accuracy of the map, and it is believed to be the most reliable yet published. The map is based on the latest available information, and is intended to be a guide to the river and its tributaries. It is not intended to be a legal document, and is not to be used as such.

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Perceiving that such images were already of interest not only to the colonists but also to their overseas networks, he had lost no time in advertising his colour printed greeting cards. These were capable of arousing further awareness of this small colony at an opportune time, just as tourism was increasing. In fact the use of natural imagery from the Antipodean environment of New Zealand in the Christmas cards had been quite a modern concept.

Working from a provincial town in an environment of a tiny but as yet largely unexploited market, Willis made his mark. His imagination and vision, coupled with financial expertise and a good business sense had allowed him to succeed especially in the field of jobbing colour, an area of printing for which he had taken care to employ suitable expertise before embarking on such specialties as chromolithography and photolithography. Willis represents an example of solid competence coupled with the ability to discern viable business prospects, a case of a printer who, by remaining in touch with changing public preference in an area where competition had not yet been strong, had seen the opportunities provided by the colonial market, and who had successfully exploited the attributes of the New Zealand environment to bring images, many of them to that time rarely available in colour, to the wider marketplace of print.

Response to Question 4

New Zealand Colour Printers, Especially those of the Lower North Island.

Of the colour printers who came to New Zealand, it has been noted that many came directly from Britain, but that others came from the sister colony, Australia, especially at the time of the goldrushes, just as colour printing was beginning to become a business possibility in Aotearoa. More specifically, from figure 7 (page 344-5) it can be seen that of those who have been profiled in this section and whose place of birth has been identified, around half came from the British Isles. Of these groups, at least some who had received training in Australia and/or Britain were in all the main centres. London had most often been the specific training place for those who were later in the colour printing business in New Zealand. Many of the colour printers who came to New Zealand in the nineteenth century set up in business on their own account, and others worked in firms owned by others. In keeping with the planographic styles of printing that from the first prevailed in New Zealand for graphics printing, many of those employed within firms undertaking colour printing were lithographic artists.

As noted earlier, some of the private artists who were working here as artist lithographers were women, even quite early, for instance Miss Cotton who was working in Auckland in the eighteen sixties. Others worked both on their own account as artists, but also for a firm,

Figure 7: New Zealand Commercial Colour Printers: Known Place of Training/Apprenticeship/Work Experience of Personnel in the Business in N.Z. or before Immigration to New Zealand.						
Name	England	Ireland/ Scotland	Australia	New Zealand	Main NZ Work-place	Began NZ Col. Pr.
Crosbie Ward (1832-1867)		Dublin (Trinity College.)			Christchurch	Early 1860s
William Reeves (1825-1891)	London: business educ. (Born Surrey)				Christchurch	Early 1860s
Henry H. Glover (1828-1904)	Surrey: (Father) London (Kohler & Co.)		Melbourne		Christchurch (Later Australia)	Early 1860s
George Tombs (?-1901)					Christchurch	Around 1884
George H. Whitcombe (?- 1917)					Christchurch	Around 1884
Bertie Whitcombe (1875-1963)				Christchurch (Later - London & Australia)	Christchurch	Apprentice from ca.1890
Ernest Moss (fl.1894-?)					Christchurch	1898?
John Taylor (fl.1892-?)			Melbourne		Christchurch	
William Taylor (fl.1896-?)				Christchurch	Christchurch	1898
F.N. Carr (fl.ca.1898-?)	London (C. Henschel Ltd.)				Christchurch	
Alex. Wildey (1860-1953)				Napier; Lawrence; Christchurch (Whitcombe & Tombs)	Christchurch	1898?
John Taylor (fl.1892-?)			Melbourne		Christchurch	
William Taylor (fl.1896-?)				Christchurch	Christchurch	1898
Horace Weeks (1886-1907)				Auckland (Henry Brett)	Christchurch	At least by 1900
John Diedrich Schmidt (1839-1925)	Bremen				Hokitika	1860s-
Joseph L. Gregory	(London)		Melbourne (Fergusson & Mitchell)		Dunedin	Probably 1866
John Mitchell			Melbourne		Dunedin	
Thomas George	London (Ben George)				Dunedin	Late 1860s?
Percy George				Dunedin	Dunedin	
Mr Lane	England				Dunedin	
Robert Hawcridge	Leeds (A. Cooke & Son)				Dunedin	1889

Name	England	Ireland/ Scotland	Australia	New Zealand	Main NZ Work-place	Began NZ Col. Pr.
John McIndoe (1858-1916)		(Born Scotland)		Dunedin (Coulls & Culling)	Dunedin	1880s
George Watts			Melbourne (Troedel & Cooper)		Dunedin	1890s
Government Printing Office	1864 (Auckland 1842)				Wellington	1866 (stamps)
Herbert Deveril (fl.1873-1885)			Melbourne		Wellington	1876
John Blair (1843-1914)		(Born Scotland)	Melbourne (Sands & MacDougall)		Wellington	1870s
Robert Coupland Harding (1849-1916)				Napier (Born Wellington)	Napier/ Wellington	1880s
William Bock (1847-1932)			Tasmania		Wellington	1880s
Alfred E.Cousins (1852-1935)	London (Born Channel Islands.)				Wellington	1880s
Richard Brown (of Thomson & Brown)		Glasgow (McKay & Kirkwood)		Wellington (Lyon & Blair)	Wellington	1880s?
Robert Thomson					Wellington	1880s?
Frederick Sears (fl.1890s- 1900s)			Australia (Several states)		Wellington (Christchurch)	1890s
Arthur McKee (1863-1943)	Liverpool				Wellington	Around 1900
Henry Gamble	England?				Wellington (Other Places: Dunedin)	Around 1900
A.D. Willis (1842-1908)	London (Eyre & Spottiswoode)				Wanganui	1883
William Potts (fl.1883-1893)	England				Wanganui	1883
Benoni White		Belfast			Wanganui	1890s
H.I. Jones (1822-1906)	Oxfordshire				Wanganui	1880s?
Joseph Smith	(From Shropshire)			New Zealand	Palmerston North	1890s
Alfred Horton (1842/43?- 1903)	1.Hull (Born Lincolnshire)			2.Christchurch (The ChCh Press; then Timaru)	Auckland	Early 1880s
Henry Horton (1870-?)				Auckland (Born Timaru)	Auckland	
Henry Brett (1843-1927)	Sussex				Auckland	mid 1880s

for example P. McIntyre in Dunedin. It is noteworthy that lithographers who were at the forefront of the commercial graphic processes, especially those pushing the boundaries, were often photographers as well. For instance, Herbert Deveril, Frederick Sears and Benoni White all had worked in this capacity and, either concurrently or sequentially, as employee lithographers in printing firms owned by others, for example, both Deveril and Sears in the Government Printing Office, and White at the firm of A.D. Willis.

After the first colour printers of the eighteen sixties had introduced the chromolithographic arts to New Zealand, many printing firms began to make use of colour in their jobbing printing, including some in the smaller centers, for example, Hodgson and Friend in Nelson, Joseph Smith in Palmerston North and the chromolithographer John Schmidt in Hokitika. Especially in the earlier decades, many of the numerous lithographic firms that had sprung up were ephemeral, and others such as Ward and Reeves had remained in business only a relatively short time. As well, many mergers had taken place and partnerships had formed and been broken, such as that between William Bock and Alfred Cousins in Wellington. Some colour lithographers had influenced colour printing practice over a long period of time, either personally or through the apprentices they trained, for instance, Joseph Gregory, who had trained Thomas George's son Percy. All these men spent many years practising in Dunedin. Others, such as the German-born Schmidt had brought a continental influence.

As seen from section 3, new northern hemisphere colour processes had generally been transmitted to New Zealand more rapidly as time went on, increasing the options from which local colour printers could choose to appropriately service the growing market. Although still a small market overall, major colonial needs were directing printers towards the practical, the inexpensive and the popular. However, several colour printers, especially those in the lower North Island had made forays into the more expensive colour printing of books, notably Bock and Cousins of Wellington, and A.D. Willis of Wanganui in the late eighteen eighties. Other printers were pursuing colour printing for cheaper book production, such as Whitcombe and Tombs, while Robert Coupland Harding of Napier and Wellington, besides being known for his book and scientific publication, achieved fame in the area of art printing advice, especially in the letterpress style.

Towards the end of the nineteenth century, the early establishment phase had passed, the great depression was over and the total New Zealand population had increased, all factors that allowed more energy and finance to boost business development. As local markets had become more established, new openings for printers to offer colour in print products were

appearing, and the numbers of colour printers in general business, as well those who tended to specialize, rose. The demand for such items as coloured views arose as residents established relationships with the country that in time led to new feelings of identity. In addition to the ongoing need for coloured maps and plans, the market for a range of products that could be produced in colour by the jobbing printer steadily increased, such demand being reinforced by the rise of tourism. As the exploration and documentation of the topography of the country proceeded, fauna and flora were studied, and relationships with the Maori population were forged, colour was increasingly present in the form of paintings, photographs and, for cartographic purposes, manuscript maps, all of which began to be used as the basis for a range of colour printed graphics.

In New Zealand, by the end of the century commercial colour printers in all the main centres were producing a range of jobbing products in colour, both letterpress and lithographic, and some had built large businesses that possessed the capability of producing colour in many print formats. Examples in Auckland were Wilson & Horton and Henry Brett; in Dunedin Fergusson & Mitchell, J. Wilkie & Co. Ltd. and Coulls, Culling & Company; in Christchurch, H.J. Weeks and Whitcombe & Tombs (which branched also to Dunedin, Wellington and Melbourne); in Wellington included the Government Printing Office, Lyon & Blair, McKee & Gamble, and Brown Thomson & Company; and in Wanganui, H.I. Jones and A.D. Willis.

As had been the case in Britain, although earlier in the century, the ubiquity of the market for newspapers and their increasing circulation had provided the spring-board for many printers with an interest in using colour to expand business as they saw the opening to produce special colour-printed supplements. (These are to be discussed in section V.) The success of such supplements in this segment of the marketplace of print was partly attributable to the popularity of the element of colour, a feature that, once begun, had been then continued and expanded. Over the last three decades of the study period colour printers were active in newspaper firms producing these supplements in all the main centres and elsewhere, some of the major firms in this regard being Wilson & Horton and Henry Brett in Auckland, the Otago Witness Office in Dunedin, the Press and the Canterbury Times in Christchurch, and the New Zealand Mail and the Evening Post in Wellington. The colour work for these productions was often contracted out, for instance, around the turn of the twentieth century, Wilkie and Co. had lithographed the *Otago Witness* Christmas number. Such firms often possessed their own jobbing departments where many other items were printed in colour, as described at Wilson and Horton.

Skills, Career Paths and Business Aspirations of British and New Zealand Colour Printers

Skills

In Britain, by the period under study, the artistic environment was already linked to printing through the efforts of such publishers as Rudolph Ackermann who in the early nineteenth century had encouraged artists to take up print mediums such as aquatint and later, lithography. In fact, one of these artists had been Samuel Prout whose nephew John Skinner Prout had made what was apparently the first lithograph printed in colour in Australia in 1845. Samuel Prout had executed some of the illustrations for Senefelder's own book on lithography (which had its English translation in 1819), and these were of such a standard that, as mentioned by Malcolm Salaman,

his prints, with [J.D.] Harding's and Bonington's were welcomed in Paris among those of the great French artists of the period.¹⁶⁴

A supportive environment for individual artists fostering fruitful collaboration and general high standards was yet to appear in the Antipodes, even many years after the study period. Colonial artists working as individuals in the colour print medium, such as Miss Cotton and George O'Brien who both worked in tint lithography in the sixties, and Peter McIntyre who worked in chromolithography in the eighties, had been uncommon. But from time to time productive relationships had been formed in the commercial arena, such as the liaison between A.D. Willis and his lithographers in Wanganui and between J.L. Gregory and Thomas George in Dunedin. Talented colour printers had sometimes been responsible for setting an exemplary standard, for instance the chromolithographer William Bock in Wellington, William Potts in Wanganui, or H.J. Weeks, who had a reputation for fine art designing and printing, in Christchurch.

Not until the later decades of the nineteenth century had educational institutes offered training that was useful to commercial printing businesses specialising in graphics and colour printing in New Zealand, and even in the longer established colony of Australia, in the city of Melbourne institutions offering specific printing training had not appeared until the nineties. Rather, in the early years of colonial printing, early training had initially often been restricted to skills acquired within a family trade in the manner of the Tasmanian-born chromolithographer William Bock who had trained with his artist father in that colony. Henry Heath Glover, who had come to New Zealand via Australia also in the sixties at around the same time as William Bock, and who later also worked in New Zealand as a chromolithographer, had been born in England and had initially also been apprenticed to his painter/lithographer father. However, before emigrating, Glover had also had the

opportunity to train and work in the busy commercial centre of London in two separate firms.

Throughout the study period in Britain, and in later nineteenth century New Zealand, as a new generation of printers and lithographers who were born in the colony had taken up the trades, local apprenticeships had been the usual means of obtaining the necessary skills in both places. For example, in England George Baxter, who had produced colour plates, mainly prints, as part of a commercial venture¹⁶⁵ had trained apprentices in his process, and although the terms of his patent did not allow the skills so gained to be widely distributed among the printing community at first, many of these men later had ultimately established their own colour printing businesses in England. Even in Britain, it had not been until the seventies that professional lithographers who copied artists' drawings to stone had become more common, around the same time that the employment of power presses was also increasing. Consequently, from that time, the greater outputs becoming possible provided additional work for lithographers and allowed the profession to expand. In the colonial New Zealand situation, by the seventies it had been the growing number of established businesses that facilitated collaboration between tradespeople with complementary skills, and this in turn was providing opportunities for apprentices to be trained in a wider variety of printing areas within a printing environment that was typically generalist in outlook. It can be seen that it was sometimes through the presence of a particularly gifted lithographer who had trained a number of apprentices in a given town that the environment had been successfully seeded and the skill foundations necessary for the later attainment of quality colour printing in many other establishments had been laid. Just as George Baxter had trained apprentices in England, so had the London trained master lithographer J.L. Gregory (who had worked in Melbourne at Fergusson & Mitchell before coming to Dunedin) been responsible for the later training of New Zealand apprentices, including Percy George at Mills, Dick and Co. and John McIndoe at Coulls, Culling & Co.

In the more fluid colonial business situation, those who travelled between the colonies of Australia and New Zealand and/or between the centres within the colonies were sometimes assisting the transmission of colour printing skills which, however, remained very sparsely distributed within the nineteenth century Australasian printing trades. In the colonies, as printing trade workers sought their fortune, they had tended to be more itinerant than those in business in the more settled Old World centres of printing, and often had worked in several places, thus spreading their skills more widely. For example, Henry Gamble had brought particular skills in process printing in turn to each of the main centres at the time

photomechanical relief printing was being implemented in New Zealand. Other influence and expertise was increasingly imported also directly from other northern hemisphere countries, such as from Europe and America, sometimes in the form of trade journals and other published information, and also due to personal contact with printers who emigrated and those who travelled back to such countries, sometimes in search of training in particular printing techniques.

However, except in times of conflict or war, travel as a means of attaining specific training and skill in Old World centres of excellence had been a traditional way for British printers to acquire or update skills. Examples were Rudolph Ackermann and Charles Hullmandel who both had travelled to Germany to study lithography, and Henry Bradbury who had brought new techniques of colour nature printing to England after studying with Alois Auer in Austria. But distance was more of a barrier to such personal contact for those in the remote geographical situation of New Zealand, especially in the sailing ship days.

In the early colonial period, most first generation printers who came directly to Australia or New Zealand had acquired their skills in the Old World in same way as those who had not emigrated. Consequently many printers possessed letterpress and lithographic printing skills learnt in Britain or sometimes on the continent, for instance, John Schmidt who went to the west coast of the South Island, and the Sydney printer from Slovenia, Johann Degotardi who had visited Alois Auer in Austria, and who appears to have been one of the few Australasian printers who carried out nature printing. However when the winds of photomechanical change were blowing through the printing industry in the eighteen eighties and beyond, the second generation printers and those in business who desired training in specific skills also had begun to travel back to the northern hemisphere centres of experiment to acquire specific process training, for instance, as did Alexander Sturdivant who travelled to America in 1896 before introducing copper etching techniques to New Zealand. Others travelled to Australia, for example, Charles Spencer who crossed to Sydney to gain similar skills at around that time. However, British colour printers who sometimes travelled to the continent, and, increasingly in the nineteenth century, to America, had been more likely to confine travel for educative purposes to their own hemisphere, where 'State of the Art' printing continued to be found.

Colonial printers who wished to follow and learn the latest colour printing processes were therefore obliged to communicate with northern hemisphere printing centres in some way. As an alternative way to travel, the written word had been important to career development

especially in the face of the changing technical environment. One method of bridging the gap for the colonial printers was correspondence, used for instance by Degotardi to keep in touch with Auer. Notably, this form of communication had also been used indefatigably by R.C. Harding to keep abreast of northern hemisphere printing trade developments. It had been Harding who in this way had gathered information concerning printing trends, including much that was valuable to the colonial colour printer, which he passed on to his colleagues through his journal *Typo*. For example, towards the end of the nineteenth century when Germany was increasingly taking the lead in jobbing printing, an area of great importance to New Zealand printers, Harding had facilitated the ability of Antipodean printers in established business to not only learn from the example of the best German typefounders and printers (as well as from others), but also, especially through the trade advertisements, to acquire the means of emulation. In this way they were enabled to increasingly develop skills that would further their career paths without the necessity of leaving their New Zealand workplaces.

Business Aspirations

In keeping with their position in the service sector within a small remote colonial setting, most New Zealand colour printers, with a few notable exceptions, had to adapt their colour aspirations to the reality of the small attenuated local marketplace of print with the knowledge that if advanced colour printing was required for envisaged print products, even those with New Zealand content, such work generally could be repatriated to Britain. New Zealand colour printers had to plan their business around the necessity of procuring machinery and equipment from overseas—from the typefoundries, inkmakers, paper mills, blockmakers and machinery manufacturers that for their British counterparts were closer to hand. In a working situation at distance from the Old World centres, colonial printers had to tailor their business aspirations to a situation of reliance for information concerning best practice, new processes and sources of necessary equipment on available text-books, trade journals and advertisements, on representatives from overseas firms, and agents at home and abroad, as well as on less predictable sources, such as travelling colleagues and itinerant tradesmen.

However, it is true to say that many of the personal characteristics which drove aspirations of those who were practising colour printers in both Britain and New Zealand over the study period were similar. Perhaps those who emigrated may have had a greater sense of adventure, but in general, it can be seen that many traits were often held in common by colour printers of the period on both sides of the world. These included an artistic bent, an

innate feel for colour, an innovative streak, a wish to bring affordable colour to the mass marketplace and often an inclination for painstaking work. Examples in each category were George Baxter in England and William Bock in Wellington, both of whom were colour printers working to high standards of personal artistry; Noel Humphries in England and J.L. Gregory in Dunedin who were both known for their colour skills; Charles Knight in England and A.D. Willis in Wanganui who were innovative in the colour printing business in their own ways; and Edmund Evans in England and George Whitcombe in Christchurch who strove to bring colour to the mass marketplace, including to the young. Individual colour printers on both sides of the world who put standards above other aspirations were for instance, Benjamin Fawcett in England, and Robert Hawcridge and R.C. Harding in New Zealand.

In addition, the evidence has shown that many of the successful colour printers shared such characteristics as good business sense, leadership, problem solving skills, and the ability to cope constructively with change, a necessity in the changing graphical environment of nineteenth century printing. Most possessed a combination of such qualities, either within the single person, for example, Charles Knight in England, and A.D. Willis in Wanganui; within a partnership, such as Gregory, Collins and Reynolds or Day and Haghe in England and Bock and Cousins or Lyon and Blair in Wellington; or within a firm, where collaborative effort was a hallmark, such as seen for instance, in Eyre and Spottiswoode in London and Wilson and Horton in Auckland. Such colour printing firms often benefited from a complementary combination of artistic abilities, for instance, the combination of the excellent craftsmanship of Benjamin Fawcett with the talent of the artist A.F. Lydon in England, or of the complementary art skills possessed by Thomas George and J.L. Gregory who had worked together as lithographer and pressman in the sixties in Dunedin.

Perhaps in Britain, where specialisation was by the nineteenth century more the norm among colour printers, more firms were under the ownership and influence of a single person, and therefore able to pursue specialist interests of choice. British examples were William Savage who researched the question of non oil-based colour inks and Charles Hullmandel who not only introduced true chromolithography to British commerce, but also pursued the improvement of tonal effects in colour printing. The larger marketplace and the greater aggregation of artists within the larger British population centres such as London were both factors that favoured the emergence of the specialist colour printer in Britain, particularly as the cultural trends of the period favoured a growing mass market demand for colour. The appearance of new sectors to be catered for within this market, such as that of

women and children, were opening new possibilities for colour, as, for instance, the market for coloured magazines increased, and that for gift and children's books began to grow. In Britain, where population aggregates were higher, such market growth also favoured the development of specialist interests among colour printers, where, for example, a concentration on cheap coloured books, including children's books, was possible as a business venture, and was, for instance, the area in which Edmund Evans had specialised.

Such specialisation in New Zealand was much less common. In a print culture which had at first been built on two culturally oriented streams of letterpress printing—of locally produced books for the indigenous population and newspapers particularly required by the European settlers—it could be said that missionary printing had begun an early specialisation in the area of Maori imprints, but such books were not colour printed. Within the lithographic environment of local map and plan printing, because the Government Printer was the major map printer and essentially controlled that market, such colour specialisation appeared less in the private commercial arena, although it has been seen that such work was sometimes contracted out to private printers. In the New Zealand colony, the tendency for firms to perform not only general printing but also additional parallel activities, especially bookselling, bookbinding, and stationery manufacture, militated against such specialisation, particularly at first.

In colonial towns of relatively low population, it was statistically more unlikely that any one individual would possess the business skills necessary to succeed in the wide variety of areas necessary to a general printing firm, as well as having the expertise for specialist art printing: partnerships were often formed to combine needed strengths, for instance, as was demonstrated in the fortunate liaison between Arthur McKee the man of business vision and Henry Gamble the innovator. Often a specialist colour printer was brought in, as, for instance, in the case of Ward and Reeves who employed Henry Glover from London as their colour printer, or Lyon and Blair who had employed William Bock after his arrival from Tasmania.

Later in the century, some New Zealand printers began to find areas of specialisation, and around the decade of the eighties, after the population influx, it was crucial that the specialisations that did appear were in keeping with the maintenance of viable business. For instance, A.D. Willis began to specialise in chromolithographic views and cards, Whitcombe and Tombs in school texts and children's books, and in the decade of the eighteen nineties McKee and Gamble had specialised in process illustration. However, such

specialisation was often centred on a particular market segment rather than on colour printing itself as had often been the case in England and the colour printing in many cases was a secondary concern.

Even A.D. Willis did not solely concentrate on colour printing, but rather underpinned his chromolithographic specialty with the staples of stationery manufacture, almanac printing and bookselling. Whitcombe and Tombs had made their approach to specialisation in the educational field viable by widening the local market to include Australia, (to be discussed in section V) while at the same time limiting the amount of expensive colour printing they undertook. Although this firm pioneered locally printed colour in selected school-book categories, for instance, in school geography books and some of the reading primers that they published, little locally printed colour illustration appears to have been executed for children's story books until after the study period, although A.D. Willis had attempted this genre. In the larger general printing firms such as Wilson and Horton, specialisation occurred only in the sense of distinct departments, so that for instance, by the turn of the twentieth century there were specialist lithographic and process departments within which jobbing colour printing had been executed.

Much of the business aspiration of the British colour printers had been concentrated on developing and adapting new colour processes to serve increasing mass demand, and, aided by the expertise of the engineers of the times, depended on developing the requisite machines, tools and materials to serve their business needs. Many colour printers were actively engaged in such inventive experimentation and development in Britain, while in New Zealand, with notable exceptions, rather than being at the cutting edge of scientific discovery, the innovative effort was directed more towards improvisation in the face of relative material deprivation. The lack of local manufacturing sources caused greater difficulties in obtaining materials in a situation in which nearly all requisites had to be imported from distant places. Although some Australasian tradesmen such as John Osborne in Melbourne, and Herbert Deveril and Frederick Sears who both worked in New Zealand had made real contributions to mainstream colour processes, in the main, the colonial colour printers carving out a living in New Zealand were attempting to follow in the technical footsteps of their British (and often also of their Australian) counterparts.

However, for the New Zealand colour printers, it was the natural environment in which they found themselves which had afforded much opportunity for the new. It was through the incorporation of local content that many New Zealand colour printers were able to bring to

their colour products a uniquely New Zealand flavour, as did A.D. Willis. Reflecting to the world the exotic topography, further aspects of the indigenous fauna and flora, and of the Maori people, he worked within formats that were within his reach and that could be produced in a general jobbing printing plant. Such practice fitted the economic constraints common to many local printing businesses. As had been noted, in other ways, there was no reason to believe that New Zealand jobbing printing differed in essence to British jobbing printing, except perhaps in the general standards attained, a subject to be discussed in chapter 12.

Specialisation in particular colour formats by some New Zealand printers, for instance in the area of chromolithographed greetings and playing cards by A.D. Willis, may have been a recognition that the local market could not support much competition from numerous local printers producing similar items in such categories, especially as overseas printers were also marketing to Australasia. However, in leading the local production of such colour printed items, the enterprise of this Wanganui printer had enabled him to identify a viable market niche within which to exercise the business desire to bring colour to the wider local marketplace of print. A.D. Willis tested the colour printing market for nearly every print format other than the newspaper, which in any case was the staple province of so many other colonial printers. In so doing, he was responsible for many print products of a New Zealand character, particularly the greetings cards, the view prints, postcards and book illustrations that all reflected New Zealand themes. His business prudence in building the art side of the business upon a solid base of general printing and bookselling, together with his close understanding of public attitudes and his personal attention to the quality of personnel and equipment employed, made Willis well-known for colour printing, especially from the mid to late eighties onwards. A.D. Willis was one of the few New Zealand printers who successfully concentrated business aspiration specifically on colour printing, perhaps a decision driven by his early short experience at Eyre and Spottiswoode in London and later reinforced by advertising from this firm, for instance, in the local *Typo*. In addition to the execution of chromolithography for his own print products, A.D. Willis had extended his specialty to accept colour printing contracts from the trade.

Like their British counterparts, the New Zealand settler printers were negotiating opportunities and challenges presented by the photomechanical changes occurring in both print cultures. As well, the more general cultural changes occurring in nineteenth century Britain were impinging at arms' length on the colonies. While attempting to broadly follow 'Home' British trends, in addition, the New Zealand colour printers were on untried

territory of a different kind. The colonial printing industry itself was being established under new conditions and markets were being tested. The European immigrants in New Zealand were obliged to re-orient their own sense of identity as the culture was undergoing rapid adaptation and exploration of new possibilities inherent in the phase of recent settlement they were traversing. In so doing they faced both physical and cultural challenges as they came to terms with Aotearoa and its Maori inhabitants.

Career Paths

Compared with their British counterparts, career paths followed by the colour printers in New Zealand corresponded with the dis-similarity of their life and business aspirations. By definition, the early printers in New Zealand had all emigrated from their homeland. A typical career path had begun in the British Isles or Australia, and after relocation, had then been resumed in New Zealand, or had been dislocated by a move from the British Isles to Australia and subsequently to New Zealand. In other cases, particularly seen in the career paths of those interested in the experimental side of the applications of photography to colour printing, some Antipodean printer/lithographers had moved back to the northern hemisphere in order to pursue inventions and improvements nearer to the cutting edge. This was true, for instance, of the Melbourne-based John Osborne, and also of Wellington's Frederick Sears, both of whom had found it necessary to travel back to the other side of the world to carry forward their respective interests in experimental photomechanical lithographic methods to explore colour printing applications.

Some printers who remained resident in New Zealand maintained regular contact with Britain over the course of their career as did A.D. Willis who regularly travelled back to Britain to source such requirements as up-to-date machinery. Willis had apparently actively sought his first chromolithographer from 'Home' when he engaged William Potts to execute the colour printing at his Wanganui business, and perhaps had brought him out to New Zealand following such a visit. Like A.D. Willis, others who had been responsible for the establishment, building and maintenance of some of the larger printing firms with some colour printing capability had tended to eventually settle in a specific centre, following a career path consistent with their business skills and book trade expertise. An example, also in Wanganui, was H.I. Jones from Oxfordshire, whose long-lived general bookselling and printing firm possessed colour printing capability but which excelled in book-binding. In Dunedin, it had been the Coull brothers who had brought early management skills to their firm which later, through several amalgamations, had formed the backbone of a printing business that by 1922 became Coulls, Somerville and Wilkie Ltd., well-known for its colour

expertise. Enduring Christchurch firms that showed early colour printing flair were H.J. Weeks and Whitcombe and Tombs, the latter also branching into other New Zealand cities. In Auckland the partners in Wilson and Horton and the firm of Henry Brett over the course of their careers built up the graphics side of their respective businesses, becoming influential in the development of the technical side of New Zealand colour printing.

In Wellington, Lyon and Blair were an early established, stable and influential firm with early colour capability. Under the leadership of the multi-skilled John Blair who diversified his business and kept up with printing developments, the firm had built a network of agencies from Westland to the central North Island. In this city the enduring official nature of the Government Printer had acted as a stabilising influence, the long-serving George Didsbury being an influential figure until nearly the end of the nineteenth century, while Brown and Thomson had built on the established foundations of the older firm of Robert Burrett. Other colour printers who had combined their individual skills and career paths to better further their business aspirations, were for instance, the artistic Tasmanian William Bock and the London-trained Alfred Cousins. Their partnership had resulted in one of the most ambitious colour printing projects undertaken in nineteenth century New Zealand. However, in this case, the business risk had been too great, and it appears the financial strain had resulted in the dissolution of the partnership, after which each man had pursued separate career paths.

The evidence from the profiled firms in chapter 7 has shown that in New Zealand, the expense of colour printing appears in most cases to have made the risk of embarking on colour book production potentially greater for colonial printers than for their counterparts in Britain. Even firms such as A.D. Willis and Bock and Cousins who did produce expensive coloured books were unable to pursue such work over a long period. Because such local book production had seldom proved viable, colour printers in New Zealand rarely had the opportunity to follow a career path that led to sustained work on coloured book plates of the kind that were produced in Britain over the study period. Rather, they typically found employment more in colour jobbing work producing less ambitious items such as cards, catalogues, posters, programmes and occasionally maps, the Government Printer being the main workplace in which colour experience for this format was possible. (See chapter 11.) However, as stated by Geoffrey Wakeman, towards the end of the nineteenth century, British colour-plate book printers were also diversifying into colour printing of a less expensive and demanding nature: "Only a few of the many colour printers at work by the

last decades of the century made book illustrations, although some combined it with another sphere of printing."¹⁶⁶

By such prudence and careful judgment of markets, there had been many New Zealand colour printing firms that, like their British counterparts, were able to succeed as profitable businesses while enterprisingly employing both lithographic and letterpress colour. However, in comparison with their British counterparts, who enjoyed more ready access to necessary markets, equipment and tradesmen, New Zealand firms generally judged colour bookwork to be too costly an undertaking. But as they increasingly looked to jobbing colour to complement their production without too great an outlay, in this department New Zealand printers had been more able to emulate the British printers while at the same time serving a widening demand.

Response to Question 5.

British and Colonial Printers: Problems and Solutions.

Technical

Many of the problems encountered by British colour printers in the period under study were due to difficulties inherent in the technical changes that were taking place as new processes were introduced, and others were due to old problems resurfacing in a new way. For example, obtaining exact register had been a recurring challenge for colour printers using processes requiring overprinting of more than one impression down through the centuries, and was a problem that nineteenth century chromolithographers also faced. The search for the improvement of inks, types and paper were areas of ongoing research, as was the development of suitable machinery and plate-making techniques for the new colour processes as they appeared. Because colonial printers were primarily working to create a viable printing industry in a new socio-economic environment, and technologically speaking were most often followers rather than leaders, problems of research and development tended to fall first to printers working in the northern hemisphere centres of experimentation. However, as discussed in section III, time-lags between the availability of new technical developments in Britain and in the New Zealand colony had tended to shorten as time went on.

Markets

Because colour printing was essentially an expensive undertaking in any country, business problems encountered by the colonial printers in financing colour printing had not been uncommon among Old World colour printers, including those working in the richer cultural environment in Britain. Nineteenth century cultural changes had brought similar challenges to colour printers both in Britain and New Zealand as both pioneered profitable ways to

bring colour to a widening marketplace in which the requirements of sectors such as women and children were becoming more important.

However, the lack of the large aggregations of population that were present in Britain had limited the formats that were viable to New Zealand colour printers. Rather, the absence of a robust marketplace presented a challenge to the enterprise of printers who were building their business in a new socio-economic environment, while testing possibilities for adding the element of colour. Many found the solution in adding colour to items that could be produced in the jobbing arena that was often associated with the most common printing establishments, the newspaper printing offices or the general printing firms.

Rather than problems associated with the design and production of large colour printed book productions, colonial printers most often were called on to use their ingenuity to produce the smaller jobbing items that through an enterprising use of colour would be expected to achieve a market advantage, and building other possibilities as they saw the opportunity, for instance, for the later colour printing associated with the weekly newspapers, a genre that will be further discussed in the following section.

Geographical

Equipment and Information

Many of the problems faced by New Zealand printers that were not held in common with their British counterparts were a result of the geographical location of the colony: they were very far removed from the Old World centres of printing and heavy industry. Because all equipment and machinery had to be imported, the expectation of time delays had to be built into workplace practice, and when equipment could not be easily procured or afforded, improvisation had been necessary. However, printed advertisements had provided information about suitable sources of equipment in trade publications, newspapers, and other periodicals. Commonly new information was obtained from text-books, colleagues, commercial travellers, and newly arrived tradesmen.

That such information was available to the New Zealand colour printer was shown by the fact that over the two-year period surveyed between 1887 and 1888 many of the advertisements placed in *Typo* for the notice of the trade included information for the colour printer. This was just around the time that printers were increasing their use of colour. Such advertisements provided pointers to a trade in requisite commodities for the colour printer, particularly in essential coloured inks, between New Zealand and countries of supply, especially Britain and Australia, but also America and the continent.

Tradesmen

Printers in the sparsely populated distant colony of New Zealand faced greater difficulties in obtaining suitably trained tradesmen than did their counterparts in Britain, especially in the early years. In both places, colour printers had adopted a system of apprenticeship to pass on skills from generation to generation. Although formal art and trade-based training had been only slowly established in the colony compared to formal systems of general education in other countries, such technical training had not advanced in Britain as quickly as it had in other Old World centres, particularly in Germany.

After an initial period in which skills had been imported with immigrant printers, the difficulty in updating and extending skills was ongoing, especially for the colour printer in a printing environment that could not sustain the employment of the entire range of colour processes available to their British counterparts. In Britain colour processes in use at any one time had been limited in particular periods as certain methods were favoured over others, or as some processes had in time become obsolete. However, in New Zealand, where relief and lithographic printing prevailed, these were almost always the areas in which tradesmen were required for colour work: colour printing experience available in the New Zealand colonial workplace was thus almost wholly limited to these printing environments.

Consequently, any colour printer wishing to work, for instance, in the manner of Benjamin Fawcett in colour wood engraving did not find opportunity waiting in the local printing environment. While across the Tasman it is known that such methods had sometimes been used for colour, in nineteenth century New Zealand, although woodcuts had been employed, it appears that such work had typically been produced in black and white. Wood engraving for colour printing required great skill, and in the absence of an artistic environment in which skills were being taught, there was little chance of the nurture of such an art. It is telling that the reviewer for the recent book *Wood Engraving-How To Do It* makes it clear that wood engraving for colour work was not for the beginner:

The tools are many and varied: my advice for the beginner is to limit the number to six...accepted limitations can be a useful way of focusing attention, Braque's conscious choice of a monochrome palette enabled him to solve spatial problems that would have been difficult with a full chromatic scale.¹⁶⁷

It is not surprising in the face of the many disincentives that this was not an art that was found flourishing in colonial New Zealand. From the account of processes used at the Auckland firm of Wilson and Horton in 1897 (see chapter 7), it appears that blocks prepared by wood-engraving were mainly destined for relief printing: colour printing by combination woodblock and intaglio methods were not mentioned. Copper-plate engraving work was

limited: it appears to have been mainly used for transfer work in association with lithographic machine room operations.

In New Zealand there had been little scope for colour book plate or print-making work in comparison to that afforded to a tradesman working in a British colour printing establishment. For instance, work of the scale of the print-making carried out at George Baxter's firm or the bookwork undertaken by Benjamin Fawcett was not available to New Zealand colour printers. Later, when photomechanical processes offered new challenges, the opportunities provided to their northern counterparts in photogravure and offset processes in the early twentieth century had not yet opened to colonial New Zealand printers. Here, opportunities to obtain experience in such colour printing appear from the mid-seventies to have been mainly limited to occasional photolithographic colour work. At the beginning of the twentieth century, the three and four colour processes were beginning to afford colour work in some New Zealand firms. For those colour printers whose interests lay in the experimental and developmental side, one problem of remaining in the Antipodes was that there was less likelihood of the continuance of a viable and satisfying career. Although an innovative bent had often been useful in the service of colonial improvisation, in order to pursue cutting edge research a productive solution for such tradesmen had frequently necessitated a return to the northern hemisphere.

Through the centuries of a gradual evolution of colour printing in the northern hemisphere, cross-fertilisation had occurred between British and continental modes as colour printers travelled in pursuit of business opportunities or to acquire new skills. In the nineteenth century, the effect of such activity was mirrored in the Antipodes as many tradespeople travelled between the Australasian colonies. However, between Britain and its colonies, where the educative benefit had largely been outwards from the parent culture, strong lines of communication had been maintained. Despite the fact that distance had been a hurdle, many resident New Zealand colonial printers had shown a willingness to face the long sea voyage to Britain or other places in the northern hemisphere, or at least the lesser one to Australia for such purposes as to update or extend skills, to attend an exhibition, or to acquire equipment and/or machinery.

For those who did not travel, by the last two decades of the nineteenth century the more international interchange of trade literature had begun to provide another method of regular communication for printers. In the atmosphere of secrecy that often prevailed between competing firms, and where commercial advantage depended on specific knowledge, its

acquisition was facilitated as steamer trade routes were strengthened, especially to assist the export of New Zealand produce to Britain.

Colour Printers and Standards

The greater number of art printers in business in Britain, particularly in London, than was the case in New Zealand, allowed clients to make comparison of standards more easily, potentially acting as a spur to greater effort by those who fell behind. However, in Britain there had been a growing emphasis on speed and lowered cost by the turn of the twentieth century.¹⁶⁸ In this climate the maintenance of high standards was made more difficult, not only where the employment of the more recently introduced photomechanical colour printing was concerned, but for older processes as well. To counteract this trend, educators such as Joseph Pennell who were endeavouring to guide printers towards new ways of achieving quality work, had been advocates of the benefit to business of the maintenance of realistic standards. As such advice became available to isolated colonial printers in its published form the written word also helped to bridge the geographical gap.

Although artistic culture comparable to that in Britain was not present in New Zealand, nevertheless even in the colonial setting the outstanding talent of an individual had occasionally been influential in raising printing standards. Around the time that jobbing colour was increasing, New Zealand's Robert Coupland Harding became a telling voice in *Typo*, as he published authoritative articles addressing many facets of the subject of design, including those concerning colour printing. Being culturally attuned especially to the achievements of their British counterparts, colonial colour printers naturally wished to be their equals. The importance to their professional pride of achievement is demonstrated in the frequency of comparisons concerning the work of New Zealand and British printers found in primary sources such as *The Cyclopaedia*. Colonial New Zealand colour printers felt that the handicaps they had faced did not, by definition, render them incapable of achieving high standards—rather, they wished to keep up. To do so they had needed channels by which they could receive education, view examples and hone their skills appropriately in order to improve their future business prospects. Trade journals such as *Typo* had acted in this capacity to ameliorate the problem of their relative isolation, as did opportunities for exhibiting at the various New Zealand and International Exhibitions. (See also section 6.)

¹ Alexander Turnbull Library, Tapuhi [database online] (The Library, ca1992-), name search: unpreferred: Willis, Archibald Duddington; related: Archibald Duddington Willis (Firm).

Note: Willis' middle name in a number of Library records is given as Duddington; however his baptism certificate, marriage and death certificates spell the name Duddington. (Copies of the certificates held in Artists' files, Alexander Turnbull Library, Drawings & Prints).

- ² *Wanganui Chronicle*, December 15th 1883, 4: advertisement, and note in The Whanganui Regional Museum, Archives, A.D. Willis Papers, 'Dictionary of New Zealand Biography' research notes.
- ³ *New Zealand Official Year-Book*, 1914, 992-993.
- ⁴ *The New Zealand Mail*, Christmas Number, 1899, November 18th 1899, 35.
- ⁵ Rollo Arnold, 'Town and Colony: Wanganui and New Zealand, 1870-1890', in *The Historical Record: Journal of the Whanganui Historical Society Inc.* [Wanganui: The Society], 1970-, 21 no.2 (1990): 19.
- ⁶ Rollo Arnold, 'Town and Colony: Wanganui and New Zealand, 1870-1890', 14.
- ⁷ G.H. Scholefield, *A Dictionary of New Zealand Biography* (Wellington: Government Printer, 1940), 519; dependent on *The Cyclopaedia of New Zealand: Industrial, Descriptive, Historical, Biographical Facts, Figures, Illustrations*, (Wellington: Cyclopaedia Co., 1897), 1 pt.2, 1434. (See also the *New Zealand Mail Christmas Number*, 1896, 37.)
- ⁸ Roderick Cave has addressed a comment to me concerning this matter: "Though the apprenticeship system [at this time] was already beginning to break down in the English printing trade, it seems clear that Archibald Willis was not formally apprenticed." Written comment 20th August, 2002.
- ⁹ *The Dictionary of New Zealand Biography* (Wellington: Allen & Unwin & Department of Internal Affairs, 1990), 2, 584.
- ¹⁰ Whanganui Public Library, Wanganui Founders Society, Record 17 [814].
- ¹¹ Ibid.
- ¹² Ibid.
- ¹³ *The New Zealand Mail*, Christmas Number, December 3rd, 1896, 37.
- ¹⁴ *Wanganui Herald*, January 4, 1889.
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- ¹⁶ Whanganui Regional Museum, Archives, A.D. Willis Papers; this information is on Willis' business card.
- ¹⁷ *Wanganui Herald*, August 28th, 1908, 2.
- ¹⁸ *The Dictionary of New Zealand Biography*, 2, 584.
- ¹⁹ *Familiar Faces* (New Zealand: Hatherley and Johnson, 1907), entry under Mr. A.D. Willis.
- ²⁰ *Wanganui Herald*, August 28th, 1908, 2.
- ²¹ *Wanganui Chronicle*, August 28th, 1880, 2.
- ²² *Wanganui Election Petition* (Wanganui: Wanganui Herald Office, 1882).
- ²³ *The Dictionary of New Zealand Biography*, 1, 24.
- ²⁴ Letter signed by A.D. Willis, Treasurer, W.F.A. in the *Freethought Review*, 2 no.13 (1884): 7-8.
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- ²⁷ *The Dictionary of New Zealand Biography*, 2, 584.
- ²⁸ *New Zealand Mail*, Christmas Number, 1904, 15.
- ²⁹ *The Cyclopaedia of New Zealand: Industrial, Descriptive, Historical, Biographical Facts, Figures, Illustrations*, 1897-1908 (Wellington etc.: Cyclopaedia Co., 1897-1908), 1, pt.2, 1434.
- ³⁰ 'Mr. A.D. Willis, M.H.R.: A Biographical Sketch' in *The Yeoman*, June 17th, 1893, 16.
- ³¹ Geoffrey Wakeman, *Victorian Book Illustration: The Technical Revolution* (Newton Abbot: David & Charles, [1973]), 12.
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- ³³ Geoffrey Wakeman and Gavin D.R. Bridson, *A Guide to Nineteenth Century Colour Printers* (Loughborough [Eng.]: Plough Press, c1975), 41.
- ³⁴ Geoffrey Wakeman, *The Production of Nineteenth Century Color Illustration* (Loughborough [Eng.]: Plough Press, 1976), 13.
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- ³⁷ D.R. Harvey, *Union List of Newspapers Preserved in Libraries, Newspaper Offices, Local Authority Offices and Museums in New Zealand* (Wellington: National Library of New Zealand, 1987), and Guy H. Scholefield, *Newspapers in New Zealand* (Wellington: A.H. & A.W. Reed, 1958), 141.
- ³⁸ *The Dictionary of New Zealand Biography*, 2, 584.
- ³⁹ *New Zealand Mail*, Christmas Number, 1896, 37.
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- ⁴² *The Dictionary of New Zealand Biography*, 2, 584.
- ⁴³ Whanganui Regional Museum, Archive, *Wanganui Alphabetical Directory*, 1866.
- ⁴⁴ G.H. Scholefield, ed., *A Dictionary of New Zealand Biography*, 32.

- ⁴⁵ Ibid., 33.
- ⁴⁶ *Familiar Faces*, entry under Mr. A.D. Willis.
- ⁴⁷ New Zealand Industrial Exhibition, 1885, Wellington, *The Official Record* (Wellington: The Government Printer, 1886), 92, 94.
- ⁴⁸ New Zealand Industrial Exhibition, 1885, Wellington, *The Official Record*, 95.
- ⁴⁹ *New Zealand Mail*, Christmas Number, 1896, 37.
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- ⁵³ Whanganui Regional Museum, Archives, A.D. Willis Papers, item.
- ⁵⁴ *The Cyclopaedia*, 1, pt.2, 1434-1435.
- ⁵⁵ *Wanganui Herald*, 25th January, 1889.
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- ⁵⁷ *The Freelance*, 15th October, 1904, 3b.
- ⁵⁸ *The Cyclopaedia*, 1, pt.2, 1435.
- ⁵⁹ *Wanganui Coronation Souvenir* (Wanganui: Wanganui Chronicle Co., 1911), section on A.D. Willis.
- ⁶⁰ Whanganui Regional Museum, Archives, A.D. Willis Papers, item.
- ⁶¹ Ibid., printed invitation.
- ⁶² Alexander Turnbull Library, Drawings and Prints, Biographical Card Index, entry: information from John Crowden, Art Dealer.
- ⁶³ F. Bruce Sampson, *Early New Zealand Botanical Art* (Auckland: Reed/Methuen, 1985), 114.
- ⁶⁴ *Wanganui Chronicle*, December 15th, 1883, 4.
- ⁶⁵ Ibid.
- ⁶⁶ Alexander Turnbull Library. Tapuhi [database online], biographical record, produced by name search, Potts, William.
- ⁶⁷ *Wanganui Chronicle*, September 8th, 1886, 2.
- ⁶⁸ Sampson, *Early New Zealand Botanical Art*, 114.
- ⁶⁹ Chromolithograph of Kennett Watkins', 'Death of Major Von Tempsky at Te-Ngutu-o-te-Manu, New Zealand, 7th September, 1868', lithographed by William Potts (Wanganui: A.D. Willis). Held: Alexander Turnbull Library, Drawings and Prints. Reference: C-033-006.
- ⁷⁰ *Typo*, 8 (January 1894): 2.
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- ⁷³ *Typo*, 1 (November 1887): 83.
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- ⁷⁷ Edward C. Simpson, *A Survey of the Arts in New Zealand* (Wellington: Chamber Music Society, 1961), 32.
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- ⁸² *Typo/The Monthly Record of Scientific and Educational News*, new series in 5 (28 March, 1891), between 28 and 29, under heading 'New Books', iv.
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- ¹⁰⁷ *Freethought Review*, 2 no.13 (October 1, 1884): 8.
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- ¹¹⁰ Frank Staff, *The Picture Postcard & Its Origins*, 57.
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- ¹¹⁵ Alexander Turnbull Library, Drawings and Prints, item, curios-006-017.
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Note: Acknowledgement of any plate to the Alexander Turnbull Library, Wellington, N.Z. refers to the Alexander Turnbull Library, National Library of New Zealand, Te Puna Mātauranga o Aotearoa.

SECTION V

New Zealand Colour Print Products in the Marketplace

CHAPTER 9

BOOKS AND OTHER READING MATTER

Research Question

6. What were the colour print products and market drivers for colour printing in New Zealand, and how did they differ from the colour print products and market drivers in Britain? How did the New Zealand colour printers respond to these market differences?

Introduction

Printing as a technical development can be said to have facilitated human communication by speeding up the ability for the production of texts and images, so paving the way for the possibility of a greater information flow between individuals. The fact that a print product has some degree of permanency means that once in existence print has the potential to communicate what an individual has uttered long after his or her departure: the communication it facilitates between individuals is not confined to the living. But in retrospect the special contribution of printing can also be seen to have been that the facility for easy duplication resulted in a new ability for print materials to be more *widely* disseminated. For texts, the invention of the matrix caused this change to occur in a sudden and revolutionary way in Western culture at the time of Gutenberg, but for images, where the development of printing processes that were both successful and economic was more gradual and evolutionary, such ability was slower to develop.

Testimony from the print product marketplace suggests that information held in printed form has long been a desirable acquisition. Over time print products became diversified into many forms, and their relative desirability can be seen to have depended upon a variety of specific attributes. However, for all genres of print materials, the informational content that they hold in encoded form to represent the visual experience and/or thought being communicated with the reader has always constituted a major purpose for their acquisition. As the production of printed information became more economic over time, print's innate possibility for wide dissemination was reinforced by greater affordability, and this resulted in the possibility for the penetration of printed information into all corners of the market.

For humankind, awareness of the world almost universally includes the awareness of colour: we are physiologically equipped with sensory apparatus to perceive colour in the environment, and to imagine colour in the mind. From this springs the fact that colour is a

sensory trigger, and in Darwinian evolutionary terms possibly initially developed as a selective factor as for instance, it assisted animals, including homo sapiens, to locate desirable foodstuffs, or to detect dangers: the perception of colour was a useful discriminatory visual aptitude.¹ The ability for the perception of colour, and the association of colour with some form of discriminatory advantage, whether life-giving, life-enhancing, or even life-saving, has possibly led to the experience of colour, both positive and negative, being a factor that has become built-in to human culture because of its part in natural selection.² In such ways, colour has become associated with the fulfilment of various human desires. For instance, colour in the possessions that people gather around them as part of the environments they choose may reflect attraction to colours with personal associations. Many common colour associations, for instance of blue with cold, and red with warmth have become symbolic, and as such may be used for communication purposes between individuals, for example, to convey information about the world around us, or to indicate the cognitive world within us.

For such reasons the human attribute of colour vision has acted as one determinant in the market for print products: the natural desire for colour has been reflected in the desire for colour in print products, and hence in the efforts printers have made over the centuries to tap that market potential. Printers saw that colour in print materials could be attractively used in many ways. It could be autographic, reproductive, informational, decorative, or illustrative. It could be used for the purpose of advertisement, to invitingly package information, or to enhance a product's visual desirability as an object. Thus colour could act as a market driver that could be maximised by the printer/publisher's correct perception of the preferences of the purchaser/future owner, that is, of the targetted market segment. In any one product, colour could be used to combine more than one of these functions, for example, it could be both illustrative and informational as in a colour-printed botanical or zoological illustration accompanying a scientific text. Colour as a market driver has the potential to be used in all forms of printing: in printed text, appearing in conjunction with information encoded in the typographical characters, and in graphical representations such as in images and maps it can be employed integrally as an added element of the visual language.

That the desire for colour in print products has been persistent ever since printing began has been demonstrated by its long success in the market, providing always that fashion criteria were being fulfilled and that it was affordable to the targetted sector. The judgement of the market as to desirability in relation to affordability has often in turn driven the printer's power to provide for that market. For the printer, the provision of colour represented a

greater financial outlay than for the item in black and white. Unless there were other motives for producing print products in colour that were rewards in themselves, in the main, colour as a market driver had to be matched with processes that could deliver that colour in an economic way; that is, products had to be tailored to the market in an economic sense.

Until the nineteenth century, difficulties to be overcome before printing in colours for the mass market became an economic proposition meant that its expense rendered it available only to a small market segment – in general, up until that time it had been affordable only by the wealthy. It can be seen that the way in which print products and their markets have evolved depends not only on the factors affecting the desirability of the products, but also on the ability of their creators to produce them economically, and in turn, of the market to acquire them. For printers, the technological developments of the nineteenth century, especially of lithography and the relief image processes finally enabled print materials to be produced which not only incorporated text and image printed from the same printing surface, but for which colour from the press could be both an integral and affordable part. For print culture these nineteenth century changes brought about the possibility of what Michael Twyman has termed the *lexivisual*, and part of the visual is the element of colour.

For the present theme of the relationships between New Zealand colour print products and their markets to 1914, the print products that have been preserved from the period can be used as artifacts to help determine the market drivers that were operating and the kinds of colour print materials that were appearing in the marketplace from New Zealand printers. Division of these into the categories of reading matter, prints, ephemera and maps has been made to facilitate examination, the category of reading matter including books, periodicals and newspapers. In New Zealand, although the newspaper has featured as a most important early print product since European settlement, the daily newspaper was the last of the above genre to appear in colour. However, colour appeared in association with the newspaper weeklies and will be the subject of a genre study. (See chapter 10.) It will be seen also in this section that printed books, periodicals and maps, as well as single prints and the ephemera from jobbing printing activities were all items presented in colour to the market during the study period, and each will be examined. (See Conceptual Model: chapter 2, figure 5.)

As Michael Twyman has pointed out, the very existence of libraries whose business it has been to preserve books, has meant that the printed artifacts that have survived and which are available for research are biased towards the genre of the book. Since it is in the nature of

print materials that they are relatively perishable, whenever a conscious and continuous preservation effort covering all genres has not been maintained, much has disappeared, so that what is left constitutes but a fraction of the totality. Because of their very nature, this has particularly been true of ephemeral items. For this reason the record of printed artifacts, like the fossil record, tends to be in a fragmented state. However, although not claiming to be necessarily statistically representative, it is what does remain that can be used as positive evidence of what was produced by New Zealand printers who, using the personnel and the technical means at their disposal, strove to bring colour to the marketplace of print. At the time of settlement and for a long time afterwards, it was the northern hemisphere, particularly British, print culture inheritance that was their particular model, but the new situation in a remote position on the opposite side of the globe meant that input from other places, especially from the near neighbour Australia and from other northern hemisphere cultures, was influencing the development of the new print culture, and also meant coping with new market dynamics.

Reading Matter and the 19th Century Australasian Setting

The idea of using a photograph as a book illustration had developed in England in the 1840s, and by the 1860s the practice had also caught on in Australia. Gael Newton writes that “most of the Australian books in this genre are modest affairs with portrait photographs in the frontispiece”³, a purpose for which a photograph seemed an appropriate choice. For example, the title *Souvenir of the Masques of Christmas, and of the Old and New Year*, designed in 1866 by Louisa Meredith of Hobart, photographs were used throughout: eight original prints by the photographer Charles Wooley were used as the illustrations.⁴ It was the rising era of photography that was also both fuelling and fulfilling a demand for views, giving rise to new business opportunities for photographers. By providing view photographs to be used as the basis of some of the illustrations for the pictorial journals and papers they were beginning to diversify from a hitherto heavy reliance on portraiture. Gael Newton has observed that by the mid-sixties, some Australian photographers were able to make a living as specialist view photographers:

City-based studios specialising in urban views, local scenery and pastoral properties such as Samuel Clifford in Hobart, Townsend Duryea and George Freeman ...in Adelaide, Charles Pickering in Sydney, Charles Nettleton in Melbourne and Geo P. Wright...in Queensland, developed by the mid 1860s.⁵

From the mid-fifties, photographs had also begun to be used as the basis for topical image production for some of the illustrated papers.⁶ A growing trend, especially exemplified by the photographers Nettleton and Noone of Melbourne and Pickering and Sharkey of Sydney, was to use the image as a vehicle to reflect a positive view of the progress of

colonial society. Nettleton "had reputedly photographed the first train journey in Melbourne in 1854," and was also known for his views of Melbourne of 1868. In connection with his work for government departments, subject matter also included public works, leading to Nettleton's particular reputation for urban and industrial photography. Pickering also had commissions to produce official images depicting Australia's industrial development, for instance, the prints of public works produced to be shown at the London Exhibition in 1873.⁷ Newton notes that "a particular extension of the views trade, that of press photography, is often traced to reporting of the capture of the gang of bushrangers led by Ned Kelly at Glenrowan, Victoria in 1880."⁸ However, it was not until the photomechanical revolution provided a more cost-effective means for reproductive book illustration in the eighties and newspaper illustration in the nineties that "this market exploded", ushering in the age of event reportage for the press by means of photography.⁹ Thus by the end of the century the printed image was also both meeting and creating market demand, and photography was gaining ground as it served the image-production processes not only in the northern hemisphere, but in the Antipodes as well.

Alongside the increasing use of photomechanically produced halftone images, most of which were at first in black and white partly because they could be integrally printed with texts in black and white, as was occurring in the northern hemisphere, the Antipodean community of artists were exploring fresh paths in pursuit of the expressive use of colour, a province central to the painters' territory. Especially in Melbourne this became an important cultural influence, due to the inspiration emanating from the Heidelberg School and from the adjacent artists' colony at Charterisville in the country region just to the north east where Phillips Fox and Tudor St. George Tucker had established the first summer school of painting in Australia in the 1890s.¹⁰ Ruth Zubans has explained the exploration of colour within the context of teaching practice at the Melbourne School of Art and its translation at first into depiction of the colonial landscape towards the end of the nineteenth century at Charterisville, as reported in the *Sun* on 3rd February, 1893, saying,

The students were 'allowed to paint occasionally while...learning to draw, the masters believing that the absorbing fascination of colour is in itself an aid to good careful drawing.' This was an important innovation in Australian art teaching. At the end of the first year students were tested for colour ability, and the ablest were selected (because of the shortage of accomodation) to spend some time painting in the open at Charterisville.¹¹

As mentioned by William Moore, Fox had made this *plein air* landscape painting "pre-eminently a colour school,"¹² where drawing and painting had become one: "you drew as you put the colour on." With their new emphasis on colour as affected by the local light, paintings from this movement, many by painters who became eminent Australian artists, for

instance, James Quinn and Max Meldrum (who had both worked at Charterisville), were an influential factor in the rising Australian consciousness. Many of the artists who worked there revealed afresh the colours of the Australian landscape, creating the new awareness of colour in the local environment that became part of the growing colonial cultural identity. At the same time, by reflecting a new interpretation of the local scene, colour images such as these also stimulated local taste. In turn the new interest in visual colour served to reaffirm a market demand that had been, in the realm of illustrative printed images, for the moment somewhat artificially eclipsed, but which retained a potential that was to be increasingly met as colour methods became equal to the task of providing printed colour images for all sectors of the market. For illustration of reading matter, the ongoing general public demand was not only for the photographic, but for the element of colour as well.

Colour Printing for New Zealand Books and Other Reading Matter

In New Zealand the introduction of chromolithographic printing in the eighteen sixties had given printers who adopted the process the capability of producing reading matter with illustrations that were fully colour printed, and such colour began to appear at first in periodicals and reports, and later in connection with a few larger book productions.

Colour in Periodicals

The Incidence of Coloured Maps in Periodicals

In keeping with the importance of maps to the New Zealand colonial societies, that the use of colour in maps that were frequently associated with reports and other periodicals concerning New Zealand steadily increased after the European settlement of New Zealand can be seen from Brian Marshall's list 'New Zealand Maps Published in Nineteenth Century Periodicals: A Checklist.'¹³ Within this list geological maps as a class featured strongly:

The greatest number of maps in periodicals in any one year, identified by this compiler, is 44 in 1877. Of these 44, 41 are geological.¹⁴

Both local serial productions, including the annual almanacs and directories, and overseas periodicals were included in this consideration of the appearance of this class of illustration in such genre. From this listing, it could be seen that in the eighteen forties, three such maps had been presented in colour, one in the fifties and nine in the sixties, none of which were printed for local publications, and only two of which had been printed in New Zealand. One of these, the 24 x 17 cm. 'Map of North Island New Zealand Shewing the Existing Volcanoes and Hot Springs' was from the "Survey Department November 1863" and had been published to accompany F.R. Chesney's 'On Volcanic Action in New Zealand' in the *Papers and Proceedings of the Royal Society of Tasmania*, 1863. The other, "Printed at the Gen. Gov. Lith. Press," by "J. Buchanan, lith." was F.W. Hutton's 1869 map, 'Geological

Map of the Great Barrier Island' which accompanied Hutton's 'Report on the Geology of the Great Barrier Island,' an abstract report on the progress of the Geological Survey of New Zealand during 1868-69.

In the seventies, more locally printed colour maps were apparent, as twenty-one were listed as appearing in colour in various periodicals during this decade, including many that were produced for distribution in the Henry Wise directories of New Zealand: the first group accompanying this publication appeared in 1875. Of the sixty coloured maps listed in periodicals from the eighties, a growing number were from New Zealand Government agencies, and many could be seen to have been by then locally produced and printed, often by means of photolithography at the Government Lithographic Press, as also had been some that had been published in colour in the seventies. Two 1871 examples were 12 x 21 cm. maps: '[Map Illustrating J.T. Thomson's The Whence of the Maori. Primary Era]', and '[...Secondary Era]' that had been lithographed by the botanist J. Buchanan for Thomson's article in the *Transactions and Proceedings of the New Zealand Institute* that year. Buchanan was also draughtsman to the Geological Survey Department. For both maps, a pale orange solid had been printed over a black outline map to demarcate specific areas.¹⁵

Coloured maps concerning New Zealand that accompanied periodicals in the eighteen eighties included colour printed land tenure maps from the General Survey Office in Wellington accompanying the *Crown Lands Guide*, as well as, occasionally, other locally published maps. In an 1883 issue of the journal *The Farmer's Circular and Weekly Report*¹⁶ the coloured 'Part of Block VII Maniototo District' from Fergusson & Mitchell appeared, and in the same year 'School of Agriculture Farm, Lincoln March 1883' was published in colour in the *New Zealand Country Journal*. The latter had been lithographed by the Lyttelton Times Co, Ltd.¹⁷ The *Transactions and Proceedings of the New Zealand Institute* continued to carry a few such maps as well as further geological reports.

In 1885, a coloured map that was "compiled from official sources and drawn by John Stone, Jun." appeared for the first time in a Stone's directory. Wise's *New Zealand Post Office Directories* also carried maps in colour from the later eighties — Dunedin's Thomas George & Sons were identified by Brian Marshall as the lithographic firm that produced them. In the last decade of the century, the *Crown Lands Guide* and Stone's directories continued to contain coloured maps, as did *Reports of Geological Explorations During....* By this time only a few overseas periodicals in this list carried coloured maps concerning New Zealand. One that accompanied an 1891 *Report of the Meeting of the Australasian Association of the*

Advancement of Science entitled 'New Zealand Earthquake Origins. To Illustrate a Paper by G. Hogben', was published in Sydney, while another published in London by the Royal Geographical Society for the *Geographical Journal* of 1894 was entitled 'The Geography of Mammals. Map of the Australian Region Showing its Division into Five Sub-regions'. Two further coloured maps published in 1893 in London were of the central portion of the Southern Alps, the second of these being also included in the *New Zealand Alpine Journal* of the same year, with the note

we have to thank the Royal Geographical Society for a supply of this map. Our thanks are also due to the New Zealand Government Survey for their kindly assistance in allowing us to use the additional information, not hitherto published, which will be found on this map.¹⁸

New Zealand maps published in colour in Edinburgh for the 1897 *Scottish Geographical Magazine* were to illustrate the region of the 1886 Tarawera eruption, an event that had created wide fascination. They were 'Map of Tarawera District in September 1895. Showing the New Lake Rotomahana and Line of the Great Fissure' and 'Map Showing the Volcanic Zone of North Island, NZ.' However, it could be seen from the list that during the nineties, the local annual, the *New Zealand Official Year Book* (see also below) and the periodical the *New Zealand Mines Record* carried many more coloured maps concerned with New Zealand than did any of the overseas journals for this decade. Colour maps such as those concerned with the Waihi Gold Mining Company that appeared in 1897, and others showing the mining districts and mineral localities of New Zealand continued to be circulated in the last years of the century with the *New Zealand Mines Record*. By 1870, fully chromolithographed maps published in the *Appendices to the Journals of the House of Representatives* (AJHRs) had appeared, for instance, two examples in volume 3 which were both large maps (54 x 82 cm.) produced by the Dunedin firm of Mills Dick, Lister & Co. in several colours. The first of these was entitled 'Sketch Map of the North Island of New Zealand, Shewing Approximately the Loyal and Rebel Districts from the Commencement of the Taranaki War to May 1869. Also the Proportion of Natives in each District who have Joined the Rebellion'. R.P. Hargreaves (*Literature Review*: 33) has made a chronological listing of the maps that have appeared in these volumes in his 1968 book, *Maps in the Appendices to the Journals, House of Representatives* and in his 1964 *Maps in New Zealand Provincial Council Papers*.¹⁹ (See also chapter 5.)

It is clear from Marshall's list that colour was considered a useful visual tool for maps accompanying periodicals of many varieties, from those for scholarly publications to those for general use. However, from the listing it is not clear what proportion of these maps had the colour applied from the press: to determine this the artifacts must be examined.

Colour Printing and Reading Matter—The Artifacts

Recourse to some of the artifacts, the reports, periodicals and annuals is informative concerning the development of such illustrative colour printing. All examination of artifacts for this study was carried out using x10 magnification.

An Early Colour Printed Periodical

Since the early sixties, New Zealand printers had on occasion employed tint stones to add one or two background colours to enliven a black and white image, some of which had early appeared in, for instance, the *Southern Monthly Magazine*, the first illustrated monthly magazine published in New Zealand. This was an Auckland publication that had run from March 1st 1863 until February 1st 1866, over which time five lithographs in tints appeared, the first of which, 'Koheroa/The Scene of the Engagement of the Seventeenth of July' was published in the issue for September 1863, volume 1 number 7. One of the principal lithographers was John Varty, who also ran a book-selling and stationery business.²⁰

The lithographs examined in this magazine were revealed to be printed with a single buff-yellow tint, with the white highlights scraped out. This had been usual for such single flat tint lithography at the time. For example, the frontispiece for volume 1 number 9 (November 1863), entitled 'View of Auckland from the North Shore' was based on an engraving that had been transferred to stone by the lithographer, G. Pulman of Auckland, and printed in black for the key, followed by an overall buff-yellow tint in which the whites had been scraped out to depict the highlights; the clouds, water shine and roof reflections. As part of this magazine, these images were intended for wide dissemination, as indicated on the inside front cover of volume 1 number 10 (December 1863): "Subscribers may have their copies posted to any part of the Australian Colonies, or to Great Britain, on the 5th of each month, by leaving the address at the Publishing Office." The subscription was quoted at twelve shillings per annum; by post, fourteen shillings. At the time, the trade in books and periodicals from Britain was mainly one way from Britain to Australasia: the South Pacific was seen as one marketplace. However, this was evidence that, to enhance economic viability, New Zealand printers were seeking reverse sales to Great Britain. The illustration in this number, 'The Bluff Stockade' was entirely lithographed, this time by J. Varty, with the main parts of the drawing printed in black, with the yellow-buff tint over the sky, water and land, and the whites highlighting such features as cliffs, tree trunks and two tents.

Early Reports

Even after the advent of chromolithography, the cheaper tint processes continued as a sensible means of producing more affordable colour. In fact the Christchurch firm of Ward

and Reeves had continued to use tint lithography themselves. This was the process, for instance, by which they produced the many lithographic views that accompanied two important illustrated reports prepared for the Canterbury Provincial Government around that time. The first was the 1865 *Report ...Upon the Practicability of Constructing a Bridle Road through the Gorge of the Otira...* by Edward Dobson, and the second Sir Johann Franz Julius von Haast's *Report on the Headwaters of the River Rakaia* of June 1866. Both reports were printed at the Press Office, Cashel Street, by James Fitzgerald, but the illustrations were all lithographed by Ward and Reeves. E.M. & D.G. Ellis have listed the illustrations published in these two reports, other than the maps and sections, in *Early Prints of New Zealand, 1642-1875*, and have described them all as lithographs in tints.

Edward Dobson, who was trained in all three disciplines of architecture, surveying and engineering, had arrived in New Zealand in 1850. After spending the next fourteen years as a pioneer engineer responsible for the building of many major South Island works he moved to Australia, but ultimately returned to New Zealand.²¹ The work of the pioneer engineers, described by Dobson as unattractive, hard, poorly paid, and unappreciated by the public²², included report writing. Many such documents were illustrated: part of the reporting was the visual documentation of the new terrain encountered. Dobson's Otira Report, produced in connection with one of his most important works, the linking of the east and west coasts via the Otira road, contained forty illustrations, some twenty-seven of which were lithographs in tints from original sketches by Richard Sherrin, the remainder being maps and diagrammatic sections. Some of the lithographs have dotted and broken lines superimposed to show planned features such as a bridge over a gorge. The report was published in the 1865 *Proceedings* of the Canterbury Provincial Council.

Apart from the British, over the course of the nineteenth century, immigrants coming to New Zealand from Germany were the second largest group, even although the large-scale migration plan that was contemplated did not eventuate. One influential immigrant from Germany was the scientist explorer Julius Haast, who also had multi-disciplinary training—in art, geology and mineralogy, and who contributed enormously to the gathering of knowledge concerning New Zealand and the early exploration of the country as well as serving as Director of the Canterbury Museum from 1868 until his death in 1887.²³ Haast was one of many German scientists who helped to document the physical environment of New Zealand, having arrived on the Austrian research frigate *Novara* in 1859. It has been said that “the *Novara*'s report [was] the most substantial natural history account of New Zealand until the twentieth century.”²⁴ Later, Haast described himself as having been “the

first explorer and delineator” of the Southern Alps region.²⁵ Of the twenty illustrations in the 1866 Haast Report, ten are sections and diagrams and ten are views for which the originals were executed by Haast himself, one of which, ‘Haast Pass, looking North, from the Fish River’, is a view of the Haast Pass which he had discovered. A comparison of the original watercolour painted by Julius Haast showing Mein’s Knob, Mt. Goethe, the Ramsay Glacier and Mt. Kinkel²⁶ with the lithographed version ‘View towards the Sources of the Rakaia from the Junction of Whitcombe’s Pass Stream’²⁷ shows that the reproduction is a creditable, if somewhat paler and less colourful image. Whereas Haast’s painting renders the shadows in greens and purples, the similar sized (10.7 x 21 cm.) lithograph has been created using fewer colours, which have been confined to shades of blue-grey and orange as well as the greys of the key-block which shade through to black, and which can be seen to have been printed last. The whites have been scraped out.

From examination of the plates printed for Dobson’s Otira report²⁸ it can be seen that they were lithographed using a single tint in blue in most cases, with the chalk style drawing overprinted in greys with a touch of black, the tonal values being achieved by stippling effects, and with the highlights scraped out in the traditional way, for example, to depict a portion of the Southern Alps, ‘Sketch of Hokitika Saddle, from a Sketch by R. Sherrin’, figure 14 in the report. This example is lithographically typical of the set in that it employed a simple use of colour to communicate the visual experience of this inspiring environment. Most of the reproductions in the set are after originals by the author of the report. Names of features such as “Mt. Whitcombe”, “Whitcombe’s Pass S.E. by E.” appear on the lithograph itself, and “Ward and Reeves” (occasionally “Ward and Reeves, lith. N.Z.”) is printed at the bottom left-hand of each. However, some of these illustrations are on the way to being chromolithographs, as they have employed three coloured tints as well as black and grey. For example, figure 31 ‘Source of the Waimakariri’ has been printed with a blue tint depicting sky, water and the general background of snowy or rocky slopes, green to emphasize the topographical feature of the Waimakariri valley, and pale orange to colour a few foreground boulders that give perspective, and to pick out a main geological feature: the vertical strata.

Just prior to the above reports, Julius Haast’s 1864 *Report on the Formation of the Canterbury Plains with a Geological Sketch-Map, and Five Geological Sections* had been printed at the Press Office in Christchurch, but in this case the colouring for the map and the sections, printed by Ward and Reeves, had nearly all been added by hand. For the map, entitled ‘Geological Sketch of the Canterbury Plains’, seven colours were required to

distinguish the rock systems, in addition to the lithographed colours of black for the basic map and grey printed in a shaded fashion to indicate relief. However, examination under x 10 magnification shows that, of the seven colours indicated by a key, one was also lithographed, but the other six had been added by hand. A letter written by Julius Haast in his capacity as Provincial Geologist in 1864 makes explicit that part of the function of such reports was to give "clear exposition" and that the inclusion of the illustrations was to this end.

Geological Survey Office
Christchurch, September 2nd, 1864.
To the Honourable John Hall, Secretary for Public Works

Sir, - In accordance with your instruction to report on the formation of the Canterbury Plains, I have the honour to communicate with you...the geological facts, collected during my journeys, concerning this important region, and to draw those conclusions which will bear upon many points of the highest practical value to the Province. I have added five Sections, showing the Geological Structure...together with a small Geological Sketch-map in illustration—giving a clear exposition in 4 parts...[this report gives what is] strictly indispensable to enable the unscientific reader to follow my explanations, leaving the strictly scientific part for future publication..."

I have the honor to be, Sir,
Your most obedient Servant
Julius Haast
Provincial Geologist.²⁹

The inclusion of the element of colour would have acted as a considerable visual aid to such communication for the lay person, especially for the unfamiliar and often complex geological information.

This map represents a transition towards printed colour, and indicates a probable reason for it: the many colours often needed in a geological map meant that such hand-colouring was quite difficult to achieve economically and neatly, especially in New Zealand, where there was no such tradition was established. Even a relatively small edition required considerable expertise to achieve the complexity successfully and in a standardised way. If printed colour could be employed, the production of maps and other graphic images to be incorporated in such official local publications as the Provincial *Proceedings*, for which overseas printing would have been slow and inconvenient, would be facilitated. As well, by mechanising the addition of colour, the whole production would be more streamlined.

Haast's 1866 report showed that this further step had been taken for a folding sectional diagram inserted at the back of the report, 'Comparative Diagram Shewing Sections of the Five Routes from the West Coast to the East Coast, Canterbury'. Produced from barometric observations taken by Julius Haast, this composite diagram was colour-printed by Ward and Reeves in five colours, black, blue, orange, red and green, using a separate colour for each of the five profiles of the Otira, Hurunui, Whitcombe, Rakaia and Wanaka sections, with

lettering for the labels of the topographical features shown on each profile in the corresponding colour. The colour-printers "Ward and Reeves, Chromo-Lith. Christchurch, N.Z." were acknowledged, demonstrating that this firm was endeavouring to fulfil a growing need for the employment of the extra visual tool of colour to facilitate the sometimes complicated representation of the geological and geographical information being incorporated especially into maps and plans.

It was Ward and Reeves also who printed the only illustrative image to appear in the *Appendices to the Journals of the House of Representatives* to the year 1875. However, many maps had been printed for the *AJHRs*, and for some of these colour printing had been early employed, the work being sent out to lithographers with such capability, rather than being accomplished at the Government Printing Office. (See chapters 5 and 11.) The first maps to appear in the *AJHR* for 1861 had been 'Plan Shewing Relative Extent of Lands in the Province of Taranaki' and 'Map of the North Island of New Zealand Shewing Native and European Territory.'³⁰ Printed tint colour for some maps had followed by 1864. Publications such as the *British Parliamentary Papers* and those from the British Hydrographic Office contained many of the early official maps and charts of New Zealand that were initially published overseas. In addition to the titles mentioned, others published in the latter half of the twentieth century in which the incidence of maps have been categorised and listed by R.P. Hargreaves include *Maps of New Zealand Appearing in British Parliamentary Papers* (1962) and *Nineteenth Century British Hydrographic Charts of New Zealand* (1969).³¹

In 1879, when Julius Haast was Professor of Geology at Canterbury College, his *Geology of the Provinces of Canterbury and Westland, New Zealand: A Report Comprising the Results of Official Explorations* was published with colour-printed maps. As well, more modest tint lithography had been used to colour some of the illustrations. It had been in 1867 that Crosbie Ward of Ward & Reeves had died. Although this report was still printed in Christchurch at the Times Office, and with some of the tinted lithographs locally produced, most of the maps and sections were chromolithographed overseas in Vienna. This was indicative of the reputation that had been gained there, especially in the seventies, for attention to quality colour printing of maps, and shows that New Zealanders were prepared to look to places other than Britain for overseas colour printing expertise, especially when complicated work was required in the period of early establishment, when local ability was tenuous and likely to falter. For example, the foldout map before page 1, 'A Geological Map of the Provinces of Canterbury and Westland New Zealand' by Julius Haast was

printed by the Viennese lithographer F. Köke. For this map eleven basic colours had been used, but with the key considerably extended through the employment of symbols in conjunction with the colour, for example, yellow was used both as a plain colour and overprinted with dots. Although register was not perfect the effect of clear colouring was visually pleasing. The tint photolithography used for some of the locally printed illustrations had been accomplished to a very good standard by the Lyttelton Times Company in Christchurch, for instance for the double tint lithograph in buff and grey entitled 'Skeleton of *Dinornis Maximus* (Owen) with that of a *Moriori* (Chatham Islands) for Comparison', the basic photography for which was attributed to (the late) Dr. A.C. Barker. A buff tint had also been used to enliven the nine sections at the back of the report. In this case the combination of printers had been used to advantage to accomplish the desired illustration. After the demise of Ward and Reeves, although the more complicated colour printing needed for some maps was possibly judged beyond the capabilities of the local general printers of the times, in that decade other local firms such as J.T. Smith & Company were however, beginning to colour print sheet and wall maps.

Books

In 1867 the New Zealand European population stood at 219,000, with just over a third in the North Island, where at that stage the "general economic development lagged behind that of the South Island."³² As mentioned, the seventies explosion of population under the assisted immigration scheme and a vigorous policy of public works had seen 200,000 immigrants arriving in New Zealand, although the Maori population had not expanded, but rather had by then even declined, standing in 1872 at about a fifth of the 256,000 figure given for the European population that year.³³ However, the general rise in population together with the passing into law of the 1877 Education Act contributed to the demand for more printed matter, especially reading matter, in the colony. Fiction was especially popular. As mentioned by Anna and Max Rogers, publishers' travellers were often based in Australia, especially in the early days, and would visit New Zealand once a year to take booksellers' orders.³⁴ As Graeme Johanson has graphically shown in figures 13-14 in his study of colonial editions, the voracious reading appetite of nineteenth century Australasian colonists is indicated by the fact that Australia was by the mid-seventies the largest importer of British books, and that, for its size, New Zealand also took considerable consignments.³⁵ Of the Australian market, Martyn Lyons has said that:

Between the 1890s and the Second World War...Australian consumers formed part of a global English-language reading community served and dominated by London publishers. Australia was supplied with a mass of cheap fiction, produced by Macmillan, Methuen, Unwin, and Hodder & Stoughton, among other components of 'the mighty Paternoster Row machine.'³⁶

Reference to Johanson's graphs reveals that by 1900 Britain was exporting around 77,000 hundredweight of books to Australia and around a further 15,000 to New Zealand in that year alone. By 1914, this had increased to be in the vicinity of 120,000 for Australia, still the leading importer, while the New Zealand figure had more than doubled to around 33,000.

Until the 1880s there had been little local book production: as observed by New Zealand publisher John McIndoe, book publishing "involves sophisticated manufacturing and commercial operations and it was natural that a young country with other pre-occupations should rely on its parent to publish the books it needed."³⁷ Books were commonly imported for less than it cost the local trade to print them. At the time, customs and tariff structures did not encourage local production, and as well, poor distribution networks and the low volumes of sales that were possible impacted on the production sector. By 1886 this was changing: A.H. McIntock has observed that by then "two-thirds of the books and pamphlets being written about New Zealand were being published in the country," although "the proportion of books published overseas remained almost as considerable till the First World War."³⁸ However, James Traue has made the point that if government publications and school text books are excepted, then it could be said that "most general books, that is books with a New Zealand subject content, were printed and published overseas during the nineteenth century."³⁹ Of the nineteenth century local publications recorded in Bagnall, an estimate has been made that to 1889 "one in every three" were pamphlets⁴⁰, and that of these, around 80% were published in the main centres, the split between North and South islands being roughly half and half.⁴¹ In the main centres, the larger firms were becoming predominant. For instance, it was the case that in Auckland, the bulk of book and periodical printing was carried out by the two firms of Wilson and Horton and Bretts from the seventies "until well into" the twentieth century, "despite the fact that directories of the early 1880's list no fewer than 24 Auckland printing houses."⁴²

Continuing Dependence on Overseas Printers

Particularly when extensive colour printing was required, and especially if quality reproductive work was involved, many of the books recording the increasing knowledge about New Zealand during the latter part of the nineteenth century were at the time still being published overseas, mainly in England. A famous example is Charles D. Barraud's *New Zealand Graphic and Descriptive* which was published by Sampson, Low, Marston, Searle and Rivington in London in 1877. This volume, edited by W.T. L. Travers, contains twenty-four chromolithographs, nineteen tinted lithographs on six plates, and thirty-one

wood engravings. In this case the London printer and lithographer was C. F. Kell. Presented within large white borders, the colour illustrations are large, at around 20 x 35 cm. Charles Barraud, who had lived and worked in the New Zealand colony since 1849, initially undertook the project on the advice of his friends, who he said "urged me to the undertaking, assuring me I should obtain large support...". He had found that he was able to obtain many of the "numerous subscribers" necessary for embarkation on such a venture in New Zealand. Subscriptions for such colour-plate productions were commonly sought from the well-to-do and those with known interest in the particular subject. Among the eventual subscribers were many well-known colonists, including Archibald Willis and Walter Buller. With the stated intention of conveying both the physical beauty and the indigenous flora of New Zealand to the possible traveller, Charles Barraud envisaged a work that would be "not only acceptable to the Colonists of New Zealand....[but which would] give those unacquainted with New Zealand a better idea of its general aspect." The prospect of such a production had evidently appealed to the envisaged Australasian and British market as in the 'Artist's Preface', Barraud commented that "the numerous subscribers I have obtained since I made known my intention encouraged me to proceed..." Recourse to the list shows that most were in fact New Zealand subscribers, one being the General Government of New Zealand which took fifty copies. But the wider net had yielded some subscribers from Britain and others from several Australian states—New South Wales, Victoria, Tasmania and South Australia, the latter group including the Governors of both Victoria and Tasmania. Because he felt that "it was impossible to carry out the work without personal supervision," Barraud had travelled back to England to oversee production.⁴³

Many of the views depicted in the book are of famous New Zealand features, for instance the pink and white terraces. As a basis for the production of the plates, Barraud had selected from a large number of sketches, all of which he had made during journeys in various parts of the country, with the exception of the original used for the depiction of Mount Cook which was by W.M. Hodgkins, as Barraud had not been able to visit that part of the Southern Alps himself. Although the colour printed illustrations were carried out by several chromolithographers, a certain unity of appearance was maintained. Perhaps the artist's supervision had been the influence responsible for the fact that in general a similar palette appears to have been used throughout to produce the fine stipple style chromolithographs in clear true colours. Often featured were the yellows and purple blues so typical of the effect of light on the New Zealand landscape, for example as seen in the views of Mount Egmont and of Wellington Harbour. The chromolithographic reproductions were achieved by

overprinting from many stones, for instance, the pink terraces are the subject of 'Otukapuarangi' for which the colour was achieved by C.F. Kell employing around fifteen colours: yellow, two greys, two pinks, purple, two browns, two oranges, two blues, and at least three greens.

Fittingly, both England and New Zealand were the places of publication for the colour-printed folio book *New Zealand Scenery*, chromolithographed after original water-color drawings by John Gully with descriptive letterpress by Dr Julius von Haast, which was also published in 1877; in Dunedin by Henry Wise, and in London by Marcus Ward, the firm which carried out the chromolithography.⁴⁴ The perception that New Zealand could be regarded as "the Great Britain of the South" was emphasised in the 'Introduction', with the expectation that the similarities and differences would be of interest, and that they would form the basis of the curiosity about the remote British colony expected to drive the market for such a book. The enumeration of similarities seen, such as "fertility of its soil; energy and industry of its Anglo-Saxon colonists, its constitutional government, free press, noble educational institutions" came at a time when many British people were considering emigrating, and the depiction of New Zealand's natural advantages were presented with pride. Physical features described as "grander and more diversified" than those seen in the British landscape were selected as being "sufficiently striking and characteristic to give the lover of nature some idea of the infinite beauty of that land for which the illustrious geographer Ritter prognosticated, with a truly prophetic spirit, such a glorious future."⁴⁵ Produced on very thick coated paper, this is more a folio production of loose prints, and will be discussed further in the section 'Prints' in chapter 11.

For more "popular circulation,"⁴⁶ David Blair's *The History of Australasia, From the First Dawn of Discovery in the Southern Ocean to the Establishment of Self-government in the Colonies, Comprising the Settlement and History of New South Wales, Victoria, South Australia, Queensland, Western Australia, Tasmania, and New Zealand, Together with Some Account of Fiji and New Guinea* was published in 1879 in an encyclopedic format. Containing numerous illustrations and maps, eight of which were in colour, this well designed volume was published in Glasgow, Melbourne and Dunedin. The maps were engraved and printed in colours by W. and A.K. Johnston of Edinburgh. To give atmosphere to the illustrations, for instance to the portrait of 'Captain James Cook' (facing page 72) and of the 'Aboriginals of Australia' facing page 236, chocolate and buff tones have been added using tint lithography, an economical way to bring colour to the mass market for which the book was intended.

Although W.L. Buller had many of his ornithological papers published in the *Transactions and Proceedings of the New Zealand Institute*, his well-known *A History of the Birds of New Zealand*, first published in London in 1873, and with a second edition in 1888, was another production that dealt with New Zealand content but which was entirely produced overseas. Extensive reproductive work was not attempted locally at all until the later eighties. Some of the illustrative plates were printed chromolithographically, for instance, 'Grey Kiwi. *Apteryx owenii*' showing a lateral view of the kiwi against a background of ferns.⁴⁷ The New Zealand zoologist John Andrews has commented that "very few bird books of distinction were printed by the process and the second edition stands out as a fine example of the printer's art," the plates in fact destined to become "the standard New Zealand bird portraits, unchallenged until a recent proliferation of bird artists."⁴⁸ One hazard of such arms-length production was that, in the event of a shipwreck, images such as these, representing visual records of great value to the colony, could be lost, as had partially happened in this case. In June 1889 an *Auckland Herald* report of the event was mentioned in *Typo*. It was stated that the one hundred subscription copies of Sir W. Buller's *A History of the Birds of New Zealand* that had been bound for Auckland had gone to the bottom of the sea, the steamer Matai having sunk near Mercury Island. At ten guineas each to subscribers, this book had been too expensive for the common reader to afford. In relation to the fact that the plates had been obliterated after the impressions had been taken, Cromwell Argus was said to have commented that the disaster served Buller right, calling Buller's decision to have the plates destroyed, thus rendering the book irreplaceable, a "barbarously ignorant idea."⁴⁹ However, in the world of fine art publication, such cancellation of plates was intended to boost sales and was common practice. In keeping with the aim of bringing more affordable books to the New Zealand public, in 1882 the Government Printer had published Walter Buller's *Manual of the Birds of New Zealand*, an entirely more modest production, making use of photo-lithography for the illustrative plates which were printed in black on buff-coloured backgrounds:

The accompanying plates are reductions, by a new application of photo-lithography from the inimitable drawings by Keulemans which form the coloured illustrations to [Buller's *A History of the Birds of New Zealand*].⁵⁰

Presenting another aspect of the country's unique natural environment in print by means of thirty-one full colour chromolithographic plates, Georgina Hetley's *The Native Flowers of New Zealand, Illustrated in Colours in the Best Style of Modern Chromo-litho Art, From Drawings Coloured to Nature* was published in three parts in London over the years 1887-1888, with plates prepared by Leighton Brothers, the firm that had been doing colour work

from 1851. Their work, which had included colour supplements for the *Illustrated London News* from 1855, was known to be of a generally high standard.⁵¹ The title indicated the positioning of the book within the marketplace. Hetley's meritorious specimen paintings had been exhibited in both Auckland and Wellington, where they had obtained first prize, and at the Colonial and Indian Exhibition in London where ten had been shown. However, priced at three guineas, the expense of this chromolithographed production could have been expected to prohibit its bringing images of the New Zealand flowers to a wider audience than had hitherto been possible through such exhibition. However, Hetley commented in the preface that Sir Robert Stout had personally taken copies of the book to place in public libraries and schools, and it was true also that many New Zealand colonists were quite wealthy, especially those who had settled in Christchurch. Part of the aim of this publication was to correct the impression that there were few native New Zealand flowers. The artist herself, expressing surprise at the variety of native flowers to be found, commented that her inspiration for the original painting project had partly been her wish to enable the public at large to appreciate their colours. Because pressed specimens lost the colours, the true visual delight hitherto had largely been enjoyed only by the botanist collecting specimens from the wild. Georgina Hetley said in the preface to her book:

It was on hearing a lecture from Mr Cheeseman, in Auckland, after his return from an expedition to the mountains about Nelson, and to Arthur's Pass and the Otira Gorge, Canterbury, when he showed us dried specimens of beautiful flowers of different colours, and described how lovely they looked growing in their native state, that I first thought, what a pity it was they were not painted.

Part of the sales strategy was to gain the confidence of the market as to the botanical merit of the plates for the book⁵² by including testimonials from authoritative botanists in the 'Prospectus' issued before the main production commenced. For instance, one testimonial was from the Chief Conservator of State Forests, Thomas Kirk, who had already viewed "copious series of coloured representations" and who said "the drawings unquestionably form the best and most comprehensive series of illustrations of the New Zealand Flora that has come under my notice."⁵³

Georgina Hetley, who had travelled through the country to paint the flora in situ, had been assisted by Government-funded travel, and by botanical information from botanists such as the retired John Buchanan, who had drawn for the *Transactions and Proceedings of the New Zealand Institute*. The decision to have the plates chromolithographed in England was driven Hetley said, "in order to have my plates well done."⁵⁴ This was the result of her viewing similar works published by Sampson Low Marston Searle and Rivington, which she considered had been beautifully produced. Of the plates for her own work she later said:

I am obliged to Messrs. Leighton Brothers for the way in which they have executed the plates; they have rendered my paintings exactly, except in a few cases. The proofs were sent to me for correction in Madeira, and the Portuguese Government detained the parcel in Lisbon two months...

Hetley blamed the delay for the eventual printing of the plates without her corrections, resulting in her comment that the colour in plate 26, of the wineberry (Mako-mako, *Aristotelia racemosa*), was not quite correct, and her judgment that plates 18, of the white rata (*Metrosideros albiflora*) and 25 of *Meryta sinclairii* were “not so good as they should be.”⁵⁵ However, it had been traditional for colour printing, even for New Zealand subjects, to be accomplished in Britain. Many of the species depicted in this publication were also shown in another New Zealand book depicting the flora, but for which the chromolithography was this time was being accomplished locally – for that unique publication, Mr and Mrs E. H. Featon’s 1889 *The Art Album of New Zealand Flora*, tradition had been broken. (See below.)

Printed Colour and Mass Production in New Zealand

By the mid-eighties the population of New Zealand, exclusive of the Maori people, had grown to over half a million people and the level of literacy was high at around seventy-three percent. This was partly reflected in the fact that there were one hundred newspapers in local production, including thirty dailies,⁵⁶ indicating the considerable demand for such reading material. The New Zealand newspaper incorporated much that elsewhere had devolved into separate genre, including light reading matter, the appetite for which was also being satisfied especially by imported fiction and magazines. In the first New Zealand illustrated periodical, the *Southern Monthly Magazine*, the colour that had appeared immediately created a precedent and an expectation. Later, colour tended to be introduced, where appropriate, as part of the presentation of formats such as the periodicals and weekly newspapers of the times, and especially appeared in the special numbers. (See chapter 10.)

Illustration in Locally Produced New Zealand Newspapers and Periodicals

From the sixties onwards, two decades after the birth in 1842 of the first illustrated newspaper in the world, the *Illustrated London News*,⁵⁷ the nineteenth century had seen the rise of both illustrated newspapers and periodical literature in New Zealand also, and by 1887 there were 161 serials registered as newspapers in New Zealand, which R.C. Harding considered to be “a large proportion for a European population of 580,000”, even if trade circulars and weekly reprints of daily papers were excepted.⁵⁸ By 1900, there were five periodicals that were Maori-owned.⁵⁹ As noted by R.P. Hargreaves, the *Illustrated New Zealander*, which ran for about a year in Dunedin from November 1866, was presented with the object of using regular illustrations as a means of instructing the widest circle of readers, and was thus one of the earliest New Zealand journals to use illustration in this way. The

publisher, Henry Wise, stated that the subject of illustration was to be “towns and harbours of the province”, “the grand scenery of the interior” of the country, as well as “the beauties of the more accessible parts of the colony.”⁶⁰ Such illustrative effort created an early expectation for pictorial representation of New Zealand townscapes and scenery, and such images were to become increasingly used as a market drawcard in illustrated reading matter for general consumption. This early journal was succeeded by the *Illustrated New Zealand Herald* which ran from March 1868 to August 1883 and which in turn was incorporated into the *Illustrated New Zealand News*. The latter was published in Dunedin, running from September 1883 to September 1887. In Christchurch, the *Illustrated Press* had been in production between 1868 and 1883.⁶¹

However, as discussed in chapter 7, printers had imported many of the blocks in general use for periodical illustration from England and from across the Tasman, so that overseas images were common in local newspapers and periodicals. There was also a considerable circulation built up in New Zealand for some of the actual illustrated papers that had been produced in Australia such as the *Australasian Spectator* and the *Illustrated Australian News*. Often the same illustrations appeared in different publications on both sides of the Tasman. Hargreaves has commented that:

Either the engravings were mass-printed in Australia and sent to New Zealand for inclusion with local news, or alternatively the blocks themselves were sent over. Certainly the quality of ‘local supplements’ with either engravings or lithographs of additional New Zealand scenes were generally of a lower standard. A high proportion of Australian scenes always appeared in the New Zealand papers as well.⁶²

Throughout the period under study, the geographical isolation, the small population and the colonial socio-economic setting in which most supplies, including books and periodicals, continued to be imported, and where equipment was not easily to hand (especially at first), all had militated against a New Zealand print culture developing an intrinsic ability for elaborate colour printing for large productions such as the coloured books that were instead being printed overseas, even when the content was local. Rather, printers wanting to keep up with the latest trends tended to put their effort into smaller products, and, in a situation of dependence on relatively slow shipping for nearly all supplies and a lack of any dedicated training institution to supply them with trained personnel, tended to improvise. Experiments

greater lead time was necessary for the more intricate work required for the chromolithographic colour printing.

Such colour was not to appear regularly in the genre until the late eighteen eighties when, from one of the best equipped printeries of the times, that of Wilson and Horton in Auckland, colour began to be offered to the market in annual supplements and special numbers of the *Auckland Weekly News*, a widely circulated publication. From an examination and analysis of the extant run of this paper at Auckland City Library, as well as of many of the colour supplements that have survived and that have been preserved in the Alexander Turnbull Library in Wellington, an outline of the development of graphic printing and the colour printing that became a regular feature can be discerned. Such a study acts as a baseline for the comparison of the techniques being tried and developed for the illustration of other publications within the genre by New Zealand printers, particularly in the Christmas supplements that became an expected arena for innovative pictorial presentations. (See chapter 10.)

Almanacs, Directories and Year Books

One essential of colonial life was the publication of local information of all kinds for the growing communities, especially commercial information, including lists of suppliers of goods and services, and this led to a definite market niche for such books as the almanacs, hand-books, directories and year-books, a category of reading matter that began to proliferate. Maurice Rickards has commented that "by the 1850s and 1860s in both Britain and America the almanac had become the one universally received item of printed literature, the much thumbed standby of cabin and cottage fireside."⁶³ Many were particular to one town or local area, and the production of such almanacs afforded bread-and-butter work for the local printers. *Moody's Royal Almanack for the Year 1842* was the first almanac to be printed in New Zealand, and on September 2nd 1843, was notified in *The New Zealand Gazette and Wellington Spectator* as "Just Published." The local 1843 *Wellington Almanack* was also available, at a cost of 1s. 6d. Such early almanacs of the eighteen forties typically contained farming and gardening information, customs tariffs and notes of political and historical events, and from the fifties began to include advertisements, town maps and the names of merchants and businesses.⁶⁴

In 1875, the first of Wise's national postal directories had appeared containing eleven maps in colour which have been listed by Brian Marshall.⁶⁵ Appearing in the year that the abolition of the Provinces Act was passed,⁶⁶ they mainly show the New Zealand provinces, for instance 'Wise's New Map of Otago, Corrected from Official Surveys January, 1875'.

Others were of the provinces of Hawke's Bay, Marlborough, Taranaki, Auckland, Canterbury, Nelson, Wellington and the 'Map of the North Part of the County of Westland New Zealand'. A colour map of New Plymouth was also included as well as one entitled 'Polynesian Island &c, Pacific Ocean'. From analysis of Marshall's list, these appear to be the first maps to be provided in colour by a New Zealand publisher, other than the Government printer, in a New Zealand periodical.

Recourse to a copy of *Wise's Directory of New Zealand for the Years 1875-6* shows that, rather than by tinting or chromolithography from the press, the colour for these maps had been added by hand, although rather crudely, for instance to the 50 x 38 cm. map, 'The Province of Wellington', that follows page 19 of Part II-E. This map was typical of the others also shown in colour in this directory. To the basic black map, quick washes of colour had been applied to show the land in pink and the sea in blue. The map printing had been accomplished in Dunedin by Henry Wise, but there was no mention of who was responsible for the colour work. In the Old World this was a specialty that had often fallen to women. However, in this case, rather than expertly executed, the hand-colouring appeared to have been hastily done. For such material, needed immediately for the local market, it is most likely to have been necessary to use local labour to do the hand-work: there was no time to be lost sending overseas. The poor standard of hand-colouring was perhaps one of the reasons that colour printing was to become the preferred option for such local publications.

By the late nineteenth century, New Zealand book and periodical publishing in Auckland came to be dominated by the firms of Bretts and of Wilson and Horton, a situation that was to continue "until well into the present century."⁶⁷ It was to be expected that these firms sought to tap the local market where there was a known demand for books of the directory or hand-book category, and which often required updating, and hence the printing of a new edition, sometimes on an annual basis. An example was *Brett's Colonists' Guide and Cyclopaedia of Useful Knowledge*, edited by T.W. Leys, that was originally published in 1883. This decade also saw the appearance of Cleave's and Stone's regional postal directories. The Auckland firm of P. Spencer & Co. which was established in 1884 and which had operations that covered the whole of the North Island also did "a large trade in picture almanacs."⁶⁸ Such publications often contained illustrations, perhaps wood or steel engravings printed from blocks, sometimes lithographs, and later, half-tones. In the 1897 edition of *Brett's Colonists Guide* which contained 553 plates, the screened process image of the 'Clydesdale Stallion, British Lion' that appeared on page 123 was an instance.⁶⁹

In the copy examined colour occurred only in the end-papers which were printed with a sage-green patterning, and in the gold-blocking on the cover, but occasionally simple colour was employed in an almanac, such as was used as an informational aid in the pictorial table 'Signals in Use at the Wanganui Flagstaff' which appeared in printed colour in the *H.I. Jones Shilling Almanack for 1886*, for which red and blue were used to differentiate various kinds of flags. (Plate 33.) Tinted lithographs that had been printed overseas occasionally appeared in association with such publications, for instance, the doubled tinted lithograph 'The New Zealand Festival' that had originally been printed by Day & Haghe in London and published in London in 1845 by Samuel Augustus Tegg, that was republished in 1890 as a supplement to *Brett's Almanac*. Also in the nineties, the Government Printer began publishing the *New Zealand Official Year Book* which is notable not only for its colour-printed maps, but also for its series of chromolithographed pictorial statistical diagrams that were published each year until 1910. Such representations were part of the movement traced by Michael Twyman in relation to lexivisual understanding.

Colour Printing in Books and Periodicals From the Government Printer

The New Zealand Official Year Book.

With the aim of ensuring "the proper representation of New Zealand"⁷⁰ first of all at the Sydney Exhibition of 1879, and subsequently at the Melbourne Exhibition in 1882, the first two editions of Dr Hector's *Handbook of New Zealand* had been published with some of the maps in colour for the second edition. The 1879 edition, as well as containing a sketch map of New Zealand bearing the imprint "Deveril-Photolitho", a map with the imprint "R. Burrett, Machine Lithographer, Wellington" appeared.⁷¹ The first two editions were published by Lyon and Blair, but the third revised edition, published in 1883, was this time published by the Government Printer with colour-printed illustration that extended to diagrams as well as maps. It had been pointed out in the preface that by then the published literature relating to New Zealand was very extensive; that by 1839 when the first *New Zealand Gazette* had been issued at least eighty works had appeared, and that since then there had been hundreds of monographs, as well as the valuable reports published in both the Provincial and General Government Parliamentary Papers and in the *Transactions and Proceedings of the New Zealand Institute*. It was felt that there was a need for a publication for the general reader for whom access to such publications was beyond reach, and the *Handbook* filled that need at a time when the population increase of the second wave of migration had swelled the local readership, and was also suited to the marketing of the

Plate 33: 'Signals in Use at the Wanganui Flagstaff.'

Published in the *H.I. Jones' Shilling Almanack for 1886*, un-numbered page foll. xvi.

By permission of the Whanganui Regional Museum, Archives.

SIGNALS IN USE AT THE WANGANUI FLAGSTAFF.

1. Steamer in sight
2. Sailing Vessel in sight
3. Barque in sight
4. Brig in sight
5. Three-masted Schooner in sight
6. Topsail Schooner in sight
7. Fore-and-aft Schooner in sight
8. Cutter in sight

9. Bar dangerous
10. Bar safe for steamers outwards
11. Bar safe for sailing vessels outwards
12. Bar unsafe
13. Topsail Schooner over the bar inwards
14. Steamer over the bar inwards
15. Steamer over the bar outwards
16. Vessel ashore

country overseas. To present such information for the general reader, use had been made of such former works as the Jurors Reports from the 1865 New Zealand Exhibition, a former 1875 *Handbook of New Zealand* by Julius Vogel, and Government Department records, especially for the statistical information presented.

One subject that was of general nineteenth century interest was the development of the gold-fields in the colony, and this was the subject of the 'Diagram of Statistics of New Zealand Gold Fields' chosen to be presented in colour facing page 48 in the 1883 *Handbook of New Zealand*. The diagram effectively presents in graphical form such information as the comparative returns from the various gold-fields, enabling the tracking of such statistics as the value over time of gold per miner; gold by ounce weight; and European versus Chinese mines, for both the quartz and the alluvial deposits. It was chromolithographed neatly and with accurate register using the three basic colours, black, blue and yellow, and with green produced from overprinting blue on yellow. Two colour-printed maps appeared at the end of the volume. The first, 'Sketch Map of the Geology of New Zealand by James Hector, 1883', with supporting explanatory sections, had been chromolithographed in nine mainly solid colours plus black to represent the geological ages of the rock-groups. Other features to be shown, in plain black, were coal outcrops, gold workings, auriferous reefs, copper and other ores. To extend the graphical ability, some colours were combined with symbols, for instance, pink was used both as a solid and combined with black cross-hatching or black stripes, a style that had been developed earlier in the nineteenth century in the northern hemisphere, and that was becoming a standard convention at the time for cartographic printing.⁷² Yellow, tan, mid-green, light blue, buff, and violet were all used as solids for this excellent production that folded out to around 38 x 46 cm., and which was stated to have been "Photolithographed at the General Survey Office, Wellington, N.Z. June, 1883". This was appropriate to the purpose of the presentation of much statistical information. The second, even larger, map, also produced by photolithography at the General Survey Office in May 1883 was in tint lithography only – with the coastal outline in black, and the sea in blue.

Three years later, S. Percy Smith's book, *The Eruption of Tarawera* was published also with plates and coloured maps from the Government Printing Office, in 1886. A colour-printed fold-out map was included in the 1889 *A Complete Guide to the Lakes of Central Otago the Switzerland of Australasia* which had been issued by the Lakes District Committee and the New Zealand South Seas Exhibition, compiled by Malcolm Ross, and illustrated by L.W. Wilson. The map, entitled 'The Interior Lakes of Otago, New Zealand'

had been compiled and drawn by T.M. Grand under the supervision of A. Barron in the General Survey Office in Wellington. The basic map had been printed at the GP Office by photolithographic means, and with later printings to show the areas of water in a fine blue stripe, outlined in a darker blue, and with glaciers in blue overprinted with a black stripe. The mode of mapping was to take the view from above. Forests were indicated pictorially. Such books were using graphic means to bring information together, but directed to a niche market, in this case the growing tourist market: the cover title of this publication was *Tourists' Guide Book to the Lakes District of Otago*.

In 1892 a handbook was issued again, although, at first, tentatively. It met with such success that it was decided by the Government that it should be issued as an annual publication, the *New Zealand Official Year Book*. From 1893 the imprint shows the New Zealand publisher to be the Government Printer, and Eyre and Spottiswoode to be the publisher in Britain. Now produced under Samuel Coster as Government Printer, the statistical diagrams were colour printed in a similar style to those that had appeared in the 1883 *Handbook*. For example, for a bargraph to show statistics "as returned at various census periods", numbers of horses were represented in blue, horned cattle in yellow, and pigs in green, the latter produced by overprinting blue over yellow. Maps of the land districts appeared, for example, opposite page 384, 'Wellington District' which was tinted in green. The next year, in 1894, a foldout map, 'New Zealand', was placed at the front. The basic outlines and the rivers, roads, tracks, post and telegraph stations were in black, the sea and lakes were in blue, while the coach and steamer routes stood out in red. At the bottom was stated "Photolithographed at the Department of Lands and Survey". Such representation is a pointer to the interests of the day, as well as indicative of the colour printing that the Government Printer was able to economically employ, albeit carried out by the Department of Lands and Survey. Although supervision of the printing was the responsibility of the Government Printer, the Lithographic Branch was at this stage still under the control of the Lands and Survey Department, a department for which it had executed important mapping work over the years. In fact, it was not until 1901, after thirty years under the Government Printer's supervision that the Lithographic Branch of Lands and Survey was transferred to his full control.⁷³

Because the capability for colour printing of maps was by then well established at the Department of Lands and Survey, this department was also used to produce the many statistical diagrams now appearing in colour in the *Official Year Book*. In the 1894 edition, no less than seventeen such diagrams appeared in Part II 'Statistical Information', to

graphically present data concerning such subjects as 'Birthplaces', 'Population', 'Letters Received and Despatched', 'Newspapers Received and Despatched', and 'Progress of Banking'. To accomplish the colour printing economically, prepared tints in patterns such as stripes and cross-hatches were used. In 1895, the year in which black and white half-tone photographic illustration began to appear in the *Year Book*, the colour printed statistical diagrams, now branching into pictorial representation, were attributed to "T.M. Grant. Delt". Rather than remaining in a bar-graph format, statistics such as those for 'Live Stock' were shown with the size of the beasts representing the numbers, and with different colours used to emphasize the different farm animals. (Plate 34.) Mention of these appealing diagrams was made in the preface to the 1897 edition, together with a note on the general popularity of the *Year Book*:

The diagrams and pictures were prepared in the Department of the Surveyor-General, and will doubtless be appreciated as much as those previously given and which have been most favourably noticed. This is the sixth year of issue; the demand is still increasing, and besides the sale there is a considerable further circulation of copies issued free of charge by the Government in the interests of the Colony.⁷⁴

Such colour printing for statistical representation continued each year until 1908. After this the style changed and the colour printing was simplified to the extent that graphs were printed in red. Towards the end of the study period the statistics section was remodelled: in 1913 graphs and pie-diagrams were printed in black only. The inclusion of colour printed map 'New Zealand' at the front of the *Official Year Book* was discontinued in 1895, just after the advent of the coloured statistical diagrams, but reappeared in 1900. In 1905 it was replaced with a new map, 'New Zealand and its Dependencies' that was "compiled from the Lands and Survey Department's map," and also in this volume other colour printed maps were introduced, of the North and South Islands showing land districts, as well as of the Cook Islands, the Kermadec Islands, and others such as the Chathams, indicating a refocussing of the New Zealand identity to include a Pacific regional dimension. By this time mapping was under the control of the Government Printer, John Mackay.

The maps of North and South Islands continued to appear throughout the period to 1914. The colour printing for these maps was based on the primaries of red, blue and yellow which was consonant with the technical simplification that had occurred towards tri-chromatic techniques. The use of prepared patterns continued, reflecting the trend towards increased use of the economies of mechanisation, so that the colouring, consisting of red stripe, blue stripe, yellow stripe and yellow/blue cross-hatch (giving dark green) was taking on a more standardised appearance. A twentieth century shift towards the employment of cartography to graphically present statistical information is exemplified by a large foldout

map that was included in the 1911 volume, “Mean Annual Rainfall Map of New Zealand” printed in black and two blues in conjunction with symbols denoting each stratum of rainfall. Also issued in 1911 from the Government Printer with colour-printed maps was R.A. Loughnan’s *New Zealand Settlers Handbook* that was in its third edition, having originally been published in 1902, the same year that *Royalty in New Zealand: The Visit of their Royal Highnesses the Duke and Duchess of Cornwall and York to New Zealand, 10th to 27th June, 1901; A Descriptive Narrative*, from the same author, had also appeared from the Government Printer with colour illustrations. The year before, in 1901, *New Zealand: Notes on its Geography, Statistics, Land System, Scenery, Sport and the Maori Race*, also by Loughnan, had been brought out by the Government Printer with colour-printed maps.

Natural Science

Scientific interest in the natural environment at the time of settlement had continued, at first with the missionary explorers like William Colenso and Richard Taylor, and then with men such as Johann Franz Julius von Haast and Ferdinand von Hochstetter, who between them had “cut a swathe for science through New Zealand.”⁷⁵ It had been the second 1870 edition of Richard Taylor’s major work, *Te Ika-a-Maui* for which the subject was not only Maori culture but also the geology, botany and zoology of New Zealand, that had been the first New Zealand natural history book for which the illustration, rather than being hand-coloured as in the first 1855 edition, was printed using chromolithography.⁷⁶ Colour printed illustration had appeared immediately in the *Transactions and Proceedings of the New Zealand Institute* in the first volume published in 1868, where a green-tinted lithograph entitled ‘Lake Hope: White Island; From a Sketch by J.C. Richmond’ illustrated the paper ‘The Crater of White Island’ by Dr. Rolston and Lieut. Edwin of H.M.’s ship *Brisk*. Although the preface makes it clear that the illustrations for the volume had been lithographed by John Buchanan, and that the Government Lithographic Press had been used for printing the lithographs, there is no specific imprint given for the colour lithograph. An important scientific publication, the *Transactions* required much illustration. For the first volumes of the late eighteen sixties and early seventies, many of the plates were lithographed as shaded or line drawings in black and white, examples being the twelve plates for the 1872 ‘Notes on the Edible Fishes’ by James Hector. The preface to volume 2 (1869), mentioning that John Buchanan had devoted “a large portion of his leisure time to the illustrations of the work”, indicates that transfer lithography had been used at first:

Plate 34: ‘Livestock.’ Example of the colour printed statistical diagrams prepared in the Department of the Surveyor-General. Attributed to “T.M. Grant. Delt”.
Published in the *New Zealand Official Year Book* for 1895, page 196.
(Held: Victoria University of Wellington Library.)

LIVE STOCK.

Cattle.

1861	1861	1871	1881	1891	1895

103,235	436,562	686,637	631,831	1,007,396	

Horses.

1861	1871	1881	1891

26,273	91,028	101,736	211,040

Sheep.

1861	1871	1881	1891	1894

2,791,383	9,700,699	12,985,085	19,126,166	20,340,526

J. M. Smith & Co.

The illustrations to the present volume have all been drawn on prepared paper, by Mr. Buchanan, and transferred to stone at the Government Lithographic Press,—the Hon. The Colonial Secretary having allowed the Board to make an arrangement with the Government Printer, for the purpose of securing for the work the superior appliances and skill available in the Government Printing Office.⁷⁷

However, by 1871, the preface mentioned that “it will be observed that this year the illustrations have, in most cases, been drawn direct on the stone, which gives to them a more artistic effect.”

During the eighteen seventies and eighties the tight financial position of the times probably had precluded extensive colour printing being taken on at the Government Printing Office, the firm priorities having been government work and the dissemination of print materials in the wider community. In spite of this, the addition of some colour was at times afforded to provide illustration for books and periodicals in an economical way by the use of tint stones. For the *Transactions* early colour printing work had been repatriated. For volume 5 (1872), the colour plate depicting the moth ‘*Porina mairi* buller’ to illustrate Buller’s ‘Notice of a New Species of Moth...’⁷⁸ (based on a drawing by Walter Buller) bore the imprint of the English firm Mintern Bros., but the chromolithography had been supervised by the lepidopterist A.G. Butler, whose name also appeared on the plate: “A.G. Butler Chromolith.” However, after this time chromolithography for the *Transactions* was accomplished in New Zealand.⁷⁹ An early locally printed colour plate entitled ‘*Haematococcus sanguineus*’ appeared in volume 7 (1874) in red and yellow with some overprinting to form orange-red to accompany Swen Berggren’s article that had been “communicated by Julius Haast”,⁸⁰ ‘On the Occurrence of *Haematococcus sanguineus* on the Wool of a Dead Sheep’. Showing in figure 1 the “Fibres of wool and alga magnified” and in figure 2 the “Alga still more magnified”, the plate had been acknowledged to “S. Berggren del.” and to “J.B. [John Buchanan] lith.” – the colour lithography had been carried out at the Government Printing Office. (Plate 35.) In 1880 two green-tinted plates of the ‘New Zealand Desmideae’ accompanied ‘Contributions Towards a List of the New Zealand Desmidieae’ by W.M. Maskell.

Between 1875 and 1887 the Government Printer had contracted out the printing of the *Transactions* to Lyon and Blair, and in this period colour printed maps appeared, for instance in volume 17 (1884), although the name of the firm does not appear on these items. As time went on and the New Zealand economy was becoming increasingly reliant on farming and forestry, a scenario in which the interests of entomologists were beginning to turn towards the subject of insects as pests. The scientific pursuit of entomology was becoming as much an economic necessity in New Zealand as a topic for the naturalist. John

Andrews, who has written in detail on scientific endeavour in the natural sciences, especially in zoology to 1900, has said that in the last two decades of the nineteenth century “men such as the ones who discovered Moa bones, and the writers of handsome bird books—and others like them—were suddenly less needed than humble entomologists.”⁸¹ Andrews cites entomologists John Enys and William Maskell, who, together with later figures such as G.V. Hudson, began to provide “an entomological counterweight to ornithology,” for which latter subject authors such as Walter Buller had fed the interest since the sixties. In the eighties W.M. Maskell was making his mark as author of *An Account of the Insects Noxious to Agriculture*, for which, as mentioned in chapter 8, the chromolithographic printing was carried out by A.D. Willis. Maskell’s earlier paper, ‘On the “Honeydew” of Coccidae, and the Fungus Accompanying these Insects’ had been published in the *Transactions* in 1886 with chromolithographed illustrations also printed by Willis.⁸² In the basic colours fawn, yellow, orange and black, overprinting in a stipple style had been employed to give tonal contrast. “W.M.M., delt ad nat.” and “A.D. Willis, Wanganui, N.Z.” appeared at the bottom of the plate. (Plate 36.)

For Maskell’s later paper, ‘Further Coccid Notes: With Descriptions of New Species...’, published in volume 28 (1896), the plates were also chromolithographed.⁸³ These were of a high standard.⁸⁴ By this time a considerable number of illustrative plates were being prepared for the *Transactions*, and, printed on glossy paper, were placed together at the back of each volume until volume 41 (1908), at which point the illustrations began to be incorporated with the scientific paper with which they were associated, but still printed on heavier coated paper. Colour was occasionally used, especially for geological maps and entomological illustration right through to 1914, the end of the period under study. An example from the 1908 volume was ‘Geological Map of Signal Hill’, plate 8 facing page 112. Comprising a map and sections that were printed using eight colours, with overprinting of more than one colour or a symbol to produce others in the usual way, it accompanied the paper by C.A. Cotton ‘Geology of Signal Hill; Dunedin, N.Z.’.

Plate 35: ‘Haematococcus sanguineus.’ Accompanies Swen Berggren’s article ‘On the Occurrence of Haematococcus sanguineus on the Wool of a Dead Sheep.’ Colour printed at the Government Printing Office: “S. Berggren del.” and “J.B. [John Buchanan] lith.” Published in the *Transactions and Proceedings of the New Zealand Institute*, 7 (1874): plate XXIV, opp. 370. (Held: Victoria University of Wellington Library.)

Plate 36: Chromolithographed illustrations to accompany W.M. Maskell’s article ‘On the “Honeydew” of Coccidae, and the Fungus Accompanying these Insects.’ “W.M.M., delt ad nat.” Printed by “A.D. Willis, Wanganui, N.Z.” Published in the *Transactions and Proceedings of the New Zealand Institute*, 19 (1886), opposite 40. (Held: Victoria University of Wellington Library.)

SPERMATOPHYTES

SPERMATOPHYTES

SPERMATOPHYTES

For such informational purposes, the truth of the colours was important, but this has never been easy to achieve, especially where the colour imitates what appears in nature, and as far as zoological colour was concerned in this regard, John Andrews considers that although the process of chromolithographic printing was generally able to afford an excellent finish, results "were sometimes found wanting where the exact colouration of a bird or insect was required, especially as live material was seldom to hand for exact comparisons, and there was sometimes a slight cast or dullness to the print."⁸⁵ However, the problem of correct colour reproduction is not one that was confined to nineteenth century chromolithography, and the technical improvements that were needed to enable the establishment of better standards for colour printing were ongoing. (See Section VI.)

As a repository of New Zealand natural science knowledge, the *Transactions* sometimes enabled the retrospective consolidation of a subject to be made in order "to bring to light" what was already known, for instance as occurred for the separate 1880 publication that was printed in Christchurch by G. Tombs & Co., *Catalogue of the Butterflies of New Zealand with a Short Preface by John D. Enys*, part of which had been published in volume 10 of the *Transactions* for 1877 (published in 1878). Thus the new publication incorporated a paper by Arthur Butler 'On the Butterflies of New Zealand' that had contained short descriptions and illustrative figures to facilitate the identification of forms of the butterflies of the species 'Rhopaloceros lepidoptera', as well as R.W. Fereday's paper 'On an Additional Species' that had originally been published in the *Entomologists' Monthly Magazine*. This was another case in which colour used to print the illustrations was intended to be informational. Whereas the illustrations for Butler's original paper had been published as black and white lithographs,⁸⁶ they were chromolithographed for the 1880 publication.

For the first four plates in *Catalogue of the Butterflies of New Zealand*, the chromolithography had been executed in London, but the fifth was colour-printed in Christchurch by G. Tombs, to depict the additional species 'Erebiola butleri, n. sp. fereday' that had been discovered in the inland Whitcombe Pass area by J.D. Enys, and described by Fereday:

I have described this butterfly from the dilapidated specimens brought to me by J.D. Enys. Esq., who had favoured me with the following account of their capture:- "I caught the three butterflies on Whitcombe's Pass, up the Rakaia, on the 8th March, 1879. The pass is over 4000 feet, and the first of the butterflies was caught close to the top, the others were near it. They were knocked down by my hat and put in paper, which must be my excuse for their state. They seem to be rather slow in their flight. And were chiefly found on the snow-grass (*Danthonia*) which covers the slopes of the hills at that height. I saw a number but only got a few."⁸⁷

All the illustrative plates were chromolithographed in simple overprintings of typically three colours for each butterfly, those done in London being more carefully printed with better

register than the last plate done by the Christchurch firm, of the new species, a good example of the difference in the level of colour printing skills at that stage. For example, for the overseas printed plate number one, acknowledged to “R. Mintern lith.” and “Mintern Bros imp.”, the several colours are orange, butter yellow, mid-brown, dark brown and black with the purples produced by overprinting of pink and blue, resulting in an overall appearance which is clear and bright. The colour for butterfly 7, ‘*Lycæna oxleyi*’ has been achieved by overprinting three colours; blue, pink and yellow, as have some of the butterflies in plate two, where, for instance, it can be seen under x 10 magnification that the order of printing was from light to dark – yellow, then orange, then dark brown – for butterfly 5. The New Zealand colour printing, for the four figures of the fifth plate, for which the drawing had been done by R.W. Fereday, was simpler, in two browns and black, for instance for figure 4a of the ventral side of the female butterfly, but the finished effect had a rougher appearance than any of plates 1-4.⁸⁸ (Plates 37, 1 and 2.)

In the field of botanical knowledge, it was practical information that was also increasingly needed, and the publication of John Buchanan’s *Indigenous Grasses* was in keeping with such a need. For the first issue of the three folio volumes of the *The Indigenous Grasses of New Zealand* (1878-1880), printed at the GP Office when George Didsbury was Government Printer, the illustrations were produced via a kind of nature printing “to ensure accuracy of form.”⁸⁹ The technique involved lightly inking the grass specimens and impressing them on the prepared surface of the lithographic stone, a straw-colour being added from the tint-stone, and details by hand. This book, for which the illustrations were by John Buchanan, had the distinction of being “the first major botanical work by a resident botanist,”⁹⁰ and was of economic importance to a colony beginning to rely on revenue gained from the development of its pastoral industries. Aimed at an envisaged market

Plate 37, 1. Chromolithographs depicting ‘*Percnodaimon pluto*; *Argyrophenga antipodum*; *Lycaena oxleyi*; *Lycaena phoebe*.’ “R. Mintern lith.”; “Mintern Bros imp.”

Published in *Catalogue of the Butterflies of New Zealand* with a short preface by John Enys; reprinted from vol. X of the *Transactions of the New Zealand Institute*. Incorporates Arthur Butler, ‘On the Butterflies of New Zealand’, and the ‘Account of an Additional Species’ by R.W. Fereday, reprinted from the *Entomologist’s Monthly Magazine*, XVI (Christchurch: G. Tombs and Co., 1880), plate I.

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Ref. No.: QL558 E61 C

Plate 37, 2. ‘*Erebiola butleri*.’ Drawn by R.W. Fereday and colour-printed in Christchurch by G. Tombs. Published in *Catalogue of the Butterflies of New Zealand* with a short preface by John Enys; reprinted from vol. X of the *Transactions of the New Zealand Institute*; incorporates Arthur Butler, ‘On the Butterflies of New Zealand’, and the ‘Account of an Additional Species’ by R.W. Fereday, reprinted from the *Entomologist’s Monthly Magazine*, XVI, (Christchurch: G. Tombs and Co., 1880), plate V.

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Ref. No.: QL558 E61 C

I.

R. Minter

Minter Bros. amp.

1, 2, *Perenodaimon pluto*.
6, 7, *Lycæna oxleyi*.

3, 5, *Argyrophenga antipodum*.
8, 9, *Lycæna phœbe*.

R.W.Fereday del.

EREBIOLA BUTLERI.

segment stated as “the practical farmer”,⁹¹ the three parts issued with just over twenty plates in each sold for 21s each. The resolution to prepare the book had been adopted by the House of Representatives in June 1876. It had been on the motion of Sir George Grey to the effect that

a work on the Native Grasses of the Colony should be prepared with nature-printed plates and descriptions of each species, and to be accompanied by an essay on the Grasses and Forage-plants likely to prove useful in New Zealand.⁹²

For example, plate XXI shows ‘*Agrostis æmula*. br.’, the “widely distributed grass often forming a prominent part of the pasture on dry, stone, or sandy soils, especially in the North island...valuable as a sheep grass in such places....”⁹³ In the finished plates, the specimens appear in black on a contrasting straw-coloured background, resulting in a clear delineation of the detail. A note in A.G. Bagnall’s *New Zealand National Bibliography* refers to the joint expertise of both the author and the GP Office lithographer as having been responsible for the success of the production:

The very high quality of the plates is a tribute both to Buchanan’s skill as a draughtsman and botanist as well as to J. Earle, lithographer in the Government Printing Office whose work is in striking contrast to that done some years later.⁹⁴

However, as stated in the preface of *The Indigenous Grasses*, “the condition imposed, that the plates should be nature-printed, has rendered it necessary to publish the work in this large size, which is both inconvenient and expensive.”⁹⁵ For these reasons, after the first edition, (which was small) it was proposed that it should later be re-issued in octavo form with the plates reduced by photolithography. This was done, and in 1880 a small-paper general edition, with the plates printed in an olive-green coloured ink was published as *Manual of the Indigenous Grasses of New Zealand*, this time printed in Wellington at the Lambton Quay Office of James Hughes. It is interesting that the year in which the octavo edition of the work was published was also the year in which William Bock again began working with Hughes, just prior to his appointment with Lyon & Blair. As examination of these volumes shows, although the photo-reduction of the plates produced a result that was not as pleasing to the eye as the appearance of the original tinted plates in which the specimens were printed in black against the straw-coloured background, the new edition was informationally good, and, in keeping with Government policy, had the virtue of affordability.

Featon’s Art Album – An Atypical Locally Colour-printed Publication

As had been pointed out in 1884 by the anonymous “resident” who compiled a publication for the New Zealand Shipping Company entitled *New Zealand: Its History, Institutions, and Industries: A Narrative with Statistics*, “in new countries the manufacturing interest has always a particularly hard time of it. Labour is scarce and dear, and small firms compete at a

disadvantage with world-known firms, even when the latter have to send their goods over thousands of miles of sea and face a not altogether favourable tariff.”⁹⁶ It was not long after this was said that in 1887 the Wellington firm of Bock and Cousins had taken the bold step of commencing the production of the first fully coloured art book to be published in New Zealand, the chromolithographed work by Mr and Mrs E. H. Featon *The Art Album of New Zealand Flora: Being a Systematic and Popular Description of the Native Flowering Plants of New Zealand and the Adjacent Islands* (1887-89). This was an example of book printing that was quite atypical in this remote New Zealand colony.

For this publication, William Bock himself directly oversaw the chromolithographic printing of the forty plates at the firm’s premises in Brandon street. The production represented a virtuoso effort in this class of colour printing, and resulted in what was described in 1897 in the first volume of the *Cyclopedia of New Zealand* as being “one of the finest, if not the finest, specimens of chromolithographic letterpress printing ever produced in this Colony.”⁹⁷ That the standard of chromolithography achieved in this production was high is verified, given the praise from the critical R.C. Harding that was published in the October 1888 edition of *Typo*, written when the second part of the *Art Album* had just been published: “The illustrations are really works of art, and reflect the highest credit on Messrs. Bock and Cousins, the chromolithographers, printers and publishers.”⁹⁸ The artistic success of this locally produced publication had particularly rested on the quality colour plates which had resulted from the keen eye of the artist for colour coupled with the skilled reproduction of that colour by the printer; that is, upon the fortunate collaboration of talented artist and talented printer.

Each plate had been created from the original watercolours by Sarah Featon who had painted most of the originals as separate natural-sized single species, although some, including the painting reproduced as the frontispiece plate depicted several species on one page. Entitled ‘Wild Flowers and Berries’, this plate, showing a sample of the flowers of New Zealand, makes a fitting introduction. (See illustrative Plate 16 in vol. 1, 262.) Chromolithographed in around thirteen colours, three reds, two greens, light and dark blue, light and dark brown, putty, lemon-yellow, orange and grey, it is typical of the way the colour printing has allowed this dimension of the flora to be presented, but the emphasis on colours in the text also is indicative that it had been important to the authors to communicate to their audience that particular element, that is, the colours of the the New Zealand flora. After naming the species, the description, written in an ornate Victorian style of the times, continues:

In the top right-hand corner we have the chaste *Epilobium pallidiflorum* from its marshy home, reposing on a background of that beautiful fern *Pteris scaberula*. Immediately underneath is the strange but pretty pink and white blossom of the *Vitex littoralis* (puriri), with its long tubular calyx and longer stamens, peeping out from a mass of *Cyathea*. On the top left-hand corner the bright-red berries of the *Rhipogonum scandens* (supplejack) are temptingly displayed, close neighbour to the golden-petalled *Potentilla*, with its rose-like, green and silvery leaflets... In the foreground to the left appears the ornate blossoms of that elegant sub-alpine tree, *Ixerba brexioides* (Tawari), with its long attractive lanceolate foliage beneath which which the Pink Manuka puts forth a claim for recognition, in company with the pendant inflorescence of *Eloeocarpus dentatus* (Hinau) overlying a frond of the delicate fern *Hymenophyllum scabrum*, and native grasses. On the right we have the foliage and fruit of the Tawa (*Nesodaphne tawa*) temptingly hung, with its insignificant flowers disposed in panicles above; beneath, the beautiful clematis *parviflora* with pale creamy flowers and dark-green foliage overlies a bed of lycopodium... In the immediate centre the *Clianthus puniceus* (kowhai-ngutu-kaka) stands out in all the glory of its crimson blossoms, the most unique and interesting of our native flora... the name of "Glory Pea" is well fitted for so gorgeous a plant.⁹⁹

Examination of the plate itself under x10 magnification shows that the colour had been built up by the chromolithographer using about thirteen stones, with the foundation printings in the lighter coloured flat inks, followed by deeper colours." The top glossy inks had been added last to emphasise the inherent contrasts, in this case on the leaves to contrast with the flat deep red of the petals of the "Glory Pea". For this work, care has been given to placement of companion specimens, both as to layout and colour composition, for instance in Plate 6 where plants which have white, or nearly white flowers have been grouped. Sometimes a small inset shows the habit of the entire plant from which the depicted flowers/berries and leaves have been drawn.

The plant descriptions, based on the *Handbook of the New Zealand Flora* by J.D. Hooker (1864, 1867), were by Sarah Featon's husband Edward, who was District Land Officer at Gisborne from 1874 until his retirement in 1898.¹⁰⁰ The *Art Album* was originally planned to be in three volumes, but only one volume, which had first been issued in three parts, was ever available for sale. The first part had appeared in 1887, and the second and third in 1888, culminating in volume I being published as a whole in 1889. Sarah Featon in fact completed many more water-colours in preparation for the further two volumes, but the project remained incomplete. The botanist Bruce Sampson, who has included a short discussion of the *Art Album* in his book *Early New Zealand Botanical Art*, speculated that, after the partnership between Bock and Cousins was dissolved, a reason for not proceeding may have been that it had been projected that the Government Printer should be the publisher of the remaining volumes, but that he had been unwilling to undertake such specialist and costly chromolithographic work at the time.¹⁰¹ However, from correspondence files held at National Archives, to be discussed below, it will be seen that financial insufficiency of the publishers, the Featons, was the likely root problem.

Both copies of the existing volume that I have examined were printed on quality coated paper, and the chromolithographic plates, each a full-page presentation protected with a semi-transparent tissue paper, are printed on white paper to give a fully reflective base.¹⁰² In the copy held at the J.C. Beaglehole Room the well-designed page layout extends to the textual pages. Printed on cream paper, the text, within ruled borders, is printed in clear typography and with finely printed decorative head-pieces, tail-pieces and initials. The end-papers were printed with an all-over fern pattern in sage green and the title on the black cover of the copy examined was gold blocked. The plates were each signed "S. Featon. Copyright", and "Bock & Cousins, Chromo-Litho.", these acknowledgements being printed in the bottom right-hand corners of each of the plates. The background tints for the plates were in pale colours, of duckegg blue, sage green, buff or grey, except for the frontispiece which had no background colour.

The chromolithography was achieved using the conventions of colour reproduction of the period from the mid-nineteenth century, that is, the building of colour using appropriate stones to apply the colours from light to dark, using at least two tones of each colour, with "the lighter being solid, and the darker printing in patches over it."¹⁰³ For instance, Plate 18, 'Kohe-Kohe-Dysoxylum spectabile' was produced from fourteen stones, typical of those in the work. The colours, in this case similar to those in the original watercolour,¹⁰⁴ have remained generally strong and clear in appearance. For some of the plates, varieties of tone have resulted from the use of an extra third tone of a particular colour, for instance in Plate 36, where, on a grey background, in addition to pale orange, brown, black, lemon and gold-yellow, three shades of green and three of red (pink, rose and scarlet) have been employed for the depiction of three species: 'Metrosideros robusta', 'Metrosideros scandens' and 'Metrosideros parkinsonii'. Register is generally accurate, and the use of a top black ink with an almost lacquer-like appearance, as for the frontispiece, has given many of the chromolithographs a lively shine.

The year in which the first part of volume one of the *Art Album* was published, 1887, was the same year in which Georgina Hetley's *The Native Flowers of New Zealand* began publication in Britain, a work for which a small French edition was also published.¹⁰⁵ Unlike Hetley, however, Sarah and Edward Featon had opted for local colour printing, because they believed that the high standard required could now be achieved in New Zealand.

To our Printers, the Authors feel that more than an ordinary meed of praise is due for the very clear and able manner in which they have interpreted their ideas, proving conclusively that New Zealand is not behindhand in the production of the highest class of chromo-lithographic work, and that the possibility of competing with the older countries in the issue of works of excellence is more than assured.¹⁰⁶

This confidence also suggested that they had a known and willing market. Botanical works were popular in the Victorian period, and much interest had been generated in the New Zealand flora as it was becoming apparent that much was unique. Trübner and Company were the London publishers.

As in Hetley's book, the preface to the *Art Album* mentions that one of the spurs for the project had been to counter the general impression that New Zealand had no native flowers, but also makes it clear that assistance had been sought from eminent New Zealand botanists such as Professor T. Kirk in order to make the work "as thorough as possible". On the botanical value of the first volume of the *Art Album*, and the veracity of the colour appearance of the plates in relation to scientific information, the contemporary New Zealand botanist, F. Bruce Sampson has written:

Critics of the time were enthusiastic about the *Art Album* and considered it a worthy companion to Sir Walter Buller's *Birds of New Zealand* (1873, 1888). The illustrations are reasonably accurate, although lacking in the finest details of floral structure. Colours are bright – one present-day art critic described them as gaudy – and many plants are more vividly coloured than in real life. Although chromolithography sometimes results in colour exaggeration, examination of the original watercolours reveals that Sarah Featon used very intense colours in which little solvent is added to the pigments. Her eye for colour was better than some of the plates indicate. For example, the orange-tinted petals of a form of manuka (*Leptospermum scoparium*) in plate 34 are shown more accurately in shades of pink and purple in the original watercolour.¹⁰⁷

However, it can be said that the accurate portrayal of some colours, particularly those occurring in nature, was not a problem that was confined to the chromolithographer, but had always been a challenge to the colour printer, and even today still exists to a degree. (See chapter 12.)

The fact that both these works were printed at much the same time, *The Flowers of New Zealand* in London and the *Art Album of New Zealand Flora* in Wellington, affords an opportunity to compare the colour printing of the plates prepared and printed by competent lithographers on opposite sides of the world to illustrate books dealing with similar subject matter, Leighton Brothers in the parent country, and Bock and Cousins in colonial New Zealand. The style of these two works is not unlike, and often the same species of plants were depicted. For example, both books include a plate showing kohekohe of the same species, and examination shows that both these reproductions have been achieved using about the same number of printings for the basic plant specimen, although extra colours were in fact used to chromolithograph the Featon painting (Plate 38.)—(Plate 18 in Featon) because she had included the fruit in her original, which Hetley had not. (Plate 39.)—(Plate 9 in Hetley). The inclusion of the fruit by Sarah Featon perhaps gave her depiction the edge, as the fruit has the showy tangerine arils inside. The chromolithographed 'Kohe-Kohe' in Hetley was on a pale sage-green ground rather than the grey of Featon, and was perhaps

slightly more life-like in the drawing, but otherwise they appear very comparable colour-wise. The flower stamens have been represented by Leightons with a touch more yellow, but the leaves appear similarly treated, the greens being very much the same. The production by Leighton Bros. has not employed the glossy black, which, while giving a lift to the Bock and Cousins plates, has left a residual slight stickiness that in some instances has meant that the plate has stuck to the tissue.

A comparison of Plate 11, Part I in Hetley with Plate 3 in Featon, both of 'The Shepherds Lily - *Ranunculus lyallii*', (known now as the Mount Cook lily), shows that although the flower petals in Featon appear rather heavier than those in the Hetley reproduction, similar colours were employed. However, Bock and Cousins have used extra shades of some colours for example, of yellow, than had Leighton Brothers in their chromolithograph, and the showing of the underside of the leaf afforded the *Art Album* plate more contrast, as well as greater botanical detail. Both have pale backgrounds, the slight blue tone in the Bock and Cousins reproduction giving a pleasing contrast to the yellows and to the white flowers, which appear creamier than those in the plate produced by Leightons.

It is interesting to note that some modern reproductions of the chromolithographs tend to have a browner appearance than the plates in either of these books, for instance the reproduction of Plate 34 in Hetley, of *Plagianthus lyalii* (the Lace-bark) that appears in Sampson (1985) as Plate 36, in which the colours appear generally stronger, the flowers greyer, and the greens browner. The plates showing '*Metrosideros florida*' in both Featon (Plate 35 in that book) and Hetley (Plate 16 in Part II), both good renditions of the showy New Zealand pohutakawa, appear (named '*Metrosideros fulgens*' in the modern manner) in Sampson's Plate 37 with browner greens, probably because the middle greens have lost their blues. Also the flower colour appears a deeper red; and the yellows of the buds in this more modern reproduction are more a mustard than a clear yellow. However, the

Plate 38: 'Kohe-Kohe—*Dysoxylum spectabile*.'

Chromolithographed in Wellington by Bock and Cousins.

Published in vol. 1 of *The Art Album of New Zealand Flora: Being a Systematic and Popular Description of the Native Flowering Plants of New Zealand and the Adjacent Islands* by Mr and Mrs E. H. Featon (Bock & Cousins, 1889), plate 18.

By permission of Victoria University Library, J.C. Beaglehole Room.

Ref. No.: QK447 F288 A

Plate 39: 'Kohe-Kohe—*Dysoxylum spectabile*.'

Chromolithographed in England by Leighton Brothers.

Published in *The Native Flowers of New Zealand: Illustrated in Colours...* by Georgina Hetley (Sampon Low, Marston, Searle and Rivington, 1888), plate 9.

By permission of Victoria University Library, J.C. Beaglehole Room.

Ref. No.: Fildes 1556-58 v.1.

KOHÉ-KOHÉ.—*Dysoxylum spectabile*

reproduction on the cover is slightly different again, its appearance being closer in colour to the Leighton reproduction. For this species, the London chromolithographers have used fewer stones, about nine, to achieve the colour than did the Wellington printers who used about thirteen, with the resulting Bock and Cousins plate appearing to contain more blue in the leaf colour as well as in the red of the flowers. This plate, which has more leaf veining, also uses greater tonal contrast in the portrayal of this species of pohutakawa, although the overall depiction of the specimen is slightly stiffer than that in the plate produced for Hetley's book. Overseas, the general trend was in the direction of fewer printings to achieve more economical methods for costly colour printing in the commercially competitive environment.

It is a striking fact that around eighty percent of the plants of New Zealand are indigenous, and for the curious, knowledge that much of the New Zealand flora appeared to be unique was sure to whet the nineteenth century travel appetite in anticipation of a novel visual experience. The depiction of the New Zealand flora in images that were seen overseas would be expected to help kindle the desire of prospective travellers to witness the phenomenon first-hand. Productions such as the *Art Album* acted as vehicles to convey information of such novelties to the rest of the world, precisely because they contained not only words, but images, and, as is well known, a picture is worth a thousand words, especially when the description is of something not seen before.

A volume such as Featons' *Art Album* was clearly aimed at the overseas as well as the local market, as was Hetley's work, and also other similar works published at around the same time, for example Emily Harris', *New Zealand Flowers*, *New Zealand Berries* and *New Zealand Ferns*¹⁰⁸, three small books for which, although they were published in New Zealand, the colour printing was accomplished in England.¹⁰⁹ In the *Art Album* the preface spelt out the aim to produce a book that would "prove acceptable to the general public", but that the achievement of the project to create "a faithful and artistic epitome of the flowering plants of New Zealand, serviceable alike for the student and artist..." would in turn require the support of the public. To this end subscriptions were sought, and apparently "about 200 subscribers, including 20 copies for the Education Department" were achieved for volume 1 at least.¹¹⁰ Information surrounding the publication of the *Art Album* that was recorded in the nineteen thirties at the time of a move to republish the first volume and to retrospectively complete the project by bringing the second and third volumes to the market for the first time, is held in Government Print files at National Archives Head Office in Wellington, where a history of the *Art Album*, based on Lands and Survey Department files, appears in a

memo prepared to investigate the circumstances surrounding the 1889 publication.¹¹¹ The suggestion of re-publication had been communicated to the Minister for Education by J.H. Stevens, the Honorary Life Secretary of the Citizen's Lunch Club, in a letter dated October 1st 1938, in which he cited Lord Bledisloe's "keen interest in the project".¹¹² This was just before New Zealand's centennial in 1940, and in anticipation of this event it may have seemed a suitable time to raise the whole matter of finishing the work.

A memorandum of 21/2/1939 that was prepared for the Undersecretary of the Publications Committee of the Internal Affairs Department where the matter was investigated, related that the first volume had been printed at the Featons' own expense, at a cost of £1,260, which soon had caused them financial difficulty: Bock and Cousins had eventually been left with a residual debt of £800, and soon afterwards had dissolved their partnership. A request from Mr Featon to the Prime Minister in 1889 to purchase 100 bound copies at a cost of £300 for distribution to libraries (in addition to the 20 copies already ordered for schools) was declined. In 1890, £300 had been placed in the supplementary estimates, but was struck off in the Committee of Supply, and further representation from various quarters for the Government to purchase copies was of no avail. In 1893, 50 copies were eventually purchased for £150 by Lands and Survey although there had been no later record of their disposal. At this stage, Mr Featon had advised that he held 175 bound volumes and 250 unbound volumes which were for sale. In the following year, again seeing the possibility of providing the publication to schools, he had sent a list of the plants painted by Mrs Featon to the Prime Minister, (296 specimens figured in 136 plates of which 40 were published in the first volume), and gave the assurance that all of the drawings of the published volume were still on the stones in Wellington (presumably at Bock and Co.).

After a further proposal to purchase the remaining 1889 volumes was declined by Cabinet, 200 unbound copies were offered by Mr. and Mrs. Featon to the Government in 1898 at the cost price of 15/- each, and at this time they were purchased by Lands and Survey. In 1899 these were sent to the Government Printer for binding, after which 21 were distributed to Ministers and the Under-Secretary, and 50 sent back to Lands and Survey, the remainder presumably being held at the Government Printing Office for sale. By 1907 it was reported that the Government Printer had 15 bound copies in stock, but no unbound copies.

Edward Featon did not give up at this point but, also in 1907, submitted a new proposal for the Government to undertake the printing and binding of 1000 copies of the entire work including the republishing of volume 1. It was suggested that the Government Printer

should undertake the binding and letterpress and that the plates should be executed in Germany at a cost of 25/- each. By this time, Germany was at the forefront of art printing techniques. Featon proposed also that 50 –60 specimens should be newly painted, and that Sarah Featon should be employed for two years at £150 a year to complete the work. When the Minister of Lands enquired of the Minister of Education whether he was interested in the undertaking, a reply was given to the effect that the Education Department was by then committed to the printing of plates (which were to be uncoloured) to accompany the botanist T.F. Cheesman's *Manual of the New Zealand Flora* at a cost of £2000, and since this was considered amply sufficient for the purposes of the Education Department, Featon's proposal was declined. The cessation of further attempts to complete the project at that stage was probably because of the death of Edward Featon in 1909. It is interesting that Featon did not appear to try for an overseas distributor, although part of the wish to entrust the original printing to a local firm had been pride in colonial abilities. Perhaps the project had gone ahead without sufficient attention to this important side. However, if he had lived longer, Featon may well have sought such means.

In his 1938 letter of October 1st to the Minister for Education, J.H. Stevens, who had also been in correspondence with a descendant of Edward and Sarah Featon, E.D. Featon, had said that shortly before her death at Gisborne, Mrs. Featon had spoken to him about the *Art Album*, saying that she had painted the pictures and that Mr Featon had written the descriptions for all three volumes and that he had been told that the whole of the paintings and manuscripts were in the custody of the Government Printer. In the same letter, Stevens had also reported that he was under the impression that the work had originally been published by the Government Printer, and that

the first and second [volumes] were published, but every copy of the second volume was destroyed by a flood in the cellar of the Government Printing Office, and [Sarah Featon] had no money with which to reproduce it or to publish the third volume.¹¹³

However, during the 1938-39 investigation of the history, a memo sent from the Government Printer to Internal Affairs pointed out that volume I had in fact been printed by Bock and Cousins, and that although the Government Printer had held stocks of Volume I of the *Art Album* for many years, of late it had not been "a ready seller." The sales figures were quoted at four copies for 1934/35, one copy for 1935/36, and one for 1936/37.¹¹⁴ The memo prepared for the Under Secretary of the Internal Affairs Publications Committee in February 1939, which was passed to the Government Printer who was to "apprise the Education Department" stated that the records search had shown that:

There is no information that the second volume was ever published, let alone destroyed by a flood in the cellar of the Government Printing Office, and it appears to be most unlikely that it was ever published. There is also no evidence to show that the paintings and manuscripts left the hands of Mr and Mrs Featon except a reference in 1894 that the paintings of the first volume were on the stone in Wellington.¹¹⁵

The investigation concluded with the decision that, because volume I covered less than a third of what the Featons had considered necessary to make the work complete in 1907, and, taking additional botanical discoveries into account, the proportion would be considerably less by 1939; and further, because a great deal of revision would be required, there did not appear to be any prospect of the work of republication being undertaken by the Government, especially in view of the large sums by then being expended on other publications, such as the *Historical Atlas* and the Centennial Surveys. The decision was relayed to all involved, including J.H. Stevens who had originally raised the matter. In fact the original watercolours are now held at the the Museum of New Zealand, Te Papa Tongarewa.

Even although the project as envisaged by Edward and Sarah Featon was never completed, their *Art Album* can be said to have been the first such book published in this country for which the colour plates were also locally printed, that took a creditable colour impression elsewhere of the indigenous plants of the country. In this case, locally achieved chromolithography was employed as never before to bring information on New Zealand's natural flora to scientists, but, de facto, was also advertising New Zealand overseas as a travel destination. However, economically speaking, the lean years at the end of the eighties deepened to depression, when many workers were laid off, and it is not surprising that colour publications such as this, involving such time, expense, and possession of expertise, could seldom be produced in nineteenth century New Zealand, where great effort was required to sell even on the small home market, and where even greater enterprise was needed to tap an overseas one.

As discussed in chapter 8, A.D. Willis of Wanganui was another local printer who had accomplished much in the area of locally produced chromolithographic book illustration, most notably for *New Zealand Illustrated*: also published in 1889. However, even Willis showed caution in this area. One book that evidently had been proposed, but in fact appears never to have been published, at least as originally envisaged, was 'Golden Otago, the Sea Queen's Daughter: An Allegorical & Humorous History of Otago'. However, a colour pamphlet did appear around the 1890s to indicate that the contents of the projected book included "upwards of fifty illustrations."¹¹⁶ This item, printed in Dunedin in crude chromolithography and colour letterpress by Samuel Lister, was illustrated by "W.J.

Wilson". Four colours had been used, with some overprinting, the register being very approximate.

Other Australasian Locally Colour-printed Books of General Interest

Gardening Books

Akin to the market for books dealing with knowledge of subjects concerned with the natural biosphere and of agriculture in colonial New Zealand was that for books and other reading matter on the subject of gardening. Knowledge of gardening was vital for European settlers who had to establish a means of food supply. The need continued as the colony became more established and gardens began to contain not only food plants but also ornamentals. Later, there was further emphasis on horticulture as public town plantings were made and nurseries were founded. As a group, books on gardening could also be expected to constitute an instance of publications on a particular subject that were likely to have brought colour illustration to the marketplace, and along with cookery, gardening was a popular New Zealand pastime. From the subject index in Bagnall, it could be seen that in addition to the gardening information in the almanacs, locally printed gardening books were being marketed in New Zealand at least from around the time that colour printing was introduced, in the eighteen sixties. Early titles such as *Chapman's Handbook to the Farm and Garden...* published in Auckland around 1862, although unillustrated, were beginning to appear with coloured paper wrappers, such as that on Andrew McEwan's *The Best Method of Saving Seeds Adapted to the Provinces of Auckland*, which was published by George Chapman in 1863 in blue paper wrappers, and the *Catalogue of Plants Cultivated for Sale* that was brought out by Mills, Dick & Co. around a decade later in Dunedin in pink paper wrappers. Illustration was beginning to appear in such books in the mid-1880s, for example in Michael Murphy's *Handbook of New Zealand Gardening with a Chapter on Bee-Keeping* that was published around 1885 by Whitcombe and Tombs Ltd. in Christchurch in green cloth boards. This book was the ninth locally published title on gardening recorded in Bagnall and the first to be illustrated: with a frontispiece and three double plates. The author was also editor of the *New Zealand Country Journal*. However, colour illustration in New Zealand gardening books did not appear until the end of the period, in a book estimated to have been published in 1914. It was *Manual of Gardening in New Zealand...* by David Tannock, published in Auckland and Christchurch by Whitcombe and Tombs with a frontispiece in colour.

Although for nursery catalogues (see chapter 11), colour printing had been earlier employed in the nature of advertising, and colour appeared on seed packets, in fact it was not until much later in the twentieth century that gardening books for the local market commonly

began to be illustrated in colour. For example, the well known *Yates' Gardening Guide* had a colour-printed frontispiece for its 32nd edition in 1946, but it was not until the 39th edition in 1957 that illustration in the body of the book was partly in colours. However, at the end of the nineteenth century, for the third edition in 1897, a new departure for illustration in the form of half-tone and line plates had led to a limited use of colour, for their printing in blue. Published in both Sydney and Auckland, the title at that time, *Yates' Gardening Guide for Australia and New Zealand*, reflected an envisioned Australasian market. The existence of trans-Tasman seed merchants such as Somner and Co. which had branches in both Australia and New Zealand, and which also published gardening books is consonant with the existence of an Australasian market for books such as this. Beginning as a Sydney publication, the ubiquitous *Yates' Gardening Guide*, by "indoctrinating the concept of annual gardens from Yates' seed,"¹¹⁷ not only exerted a great influence on gardening, but also tapped and developed the demand for both seeds and gardening books on both sides of the Tasman. Together with the *Edmonds Cookery Book*, first published in 1907, and for which the colour-printed covers were a hallmark from the early editions, *Yates' Gardening Guide* is characterised as having been "the indispensable adjunct to living in and around the New Zealand home."¹¹⁸ This practical gardening book sold around a million copies by 1993, almost a hundred years after its first appearance in 1895.

From the list compiled by Victor Crittenden in his *A History of Australian Gardening Books and A Bibliography 1806-1950*,¹¹⁹ it can be seen that, in Australia, where the first local gardening books that had tried to take account of the Australian climatic and soil conditions had been published in the eighteen thirties, by the 1860s about a third of the local gardening books had contained illustrations. For instance, the 1865 book by Albert Hockings, *Queensland Garden Manual...* was typical of the times in having a few line drawings. Illustration of gardening books increased in the eighties to the extent that about three quarters were published with black and white illustration. However, it was not until 1892 that the *Handbook of Australian Horticulture* by H.A. James appeared on the local market with some of the illustration in colour. Victor Crittenden commented that "the colour plates are probably among the first used in an Australian gardening book."¹²⁰ For this publication, which had at first appeared in twelve monthly parts in 1890, in addition to copious black and white illustrations, "each part had a large full page coloured illustration of a particular flower." Colour printing for these plates, which were from originals by Guglielmo Autoriello, had been executed by Turner and Henderson who were also the Sydney

publishers.¹²¹ Perhaps the larger market and the financial boom in Australia had enabled the use of colour in such books earlier than in New Zealand.

For Cole's *Australasian Gardening and Domestic Floriculture* published in Melbourne in 1896, and said to be "a mine of information,"¹²² the illustrated paper cover had been colour-printed. Although of the nineteen gardening titles listed by Crittenden for the decade of the nineties, twelve contained illustrations, colour printing had been employed in the production of only three. After the turn of the century when the illustrative interest in the photographic 'look' had turned to an emphasis on the use of half-tones, at first most illustrations of this kind were in black and white. However, in the first decade of the twentieth century colour printing was in evidence at least for the illustration of the last catalogue¹²³ to have been printed by G. Hemsley at his 'Home Garden Steam Printing Works' at Moss Vale. It was for Hemsley's 1901/02 *General Catalogue of Hemsley's Famous Seeds for the Garden and Farm* that seven colour illustrations were printed for the inside front cover. (See also chapter 11 for a discussion of the use of colour for such ephemeral items.) In the second decade of the twentieth century, of the nine locally published gardening books that appeared on the market to 1914, four were illustrated with photographic half-tones, two were presented in illustrated wraps and one contained colour illustration. Published by E.W. Cole Book Arcade, and dealing with a subject that had been of vital local interest since settlement, Hamilton McEwan's *The Fruitgrower's Handbook. A Practical Work on Australian Horticulture* had been produced in Melbourne in 1913.

Colour printing for dust jackets was beginning to be in evidence at the end of the study period, for instance, for David Tannock's *Manual of Gardening in Australia*, a work that was published in the 1910s with a colour printed dust wrapper. As a gardening book for general Australian conditions, this was a title whose subject was indicative of the growing national identity that followed Federation, and was also, for its genre, a forerunner of the new large gardening books of the 1920s and 1930s. Published by Whitcombe and Tombs, this book, which also contained a pasted-in colour-printed frontispiece, was heralding the later more general use of colour-printed dust jackets that began in the twenties.

Educational Books and Junior Fiction

As mentioned, the Christchurch firm of Whitcombe and Tombs had early seen a local market niche for educational books, and had gradually increased its interest in this field to include the supply of children's books and school text-books with New Zealand content. Tolla Williment notes that numerous New Zealand writers were having books printed by commercial printers by the eighteen eighties, and that "Whitcombe's book publishing

expanded into the areas of fiction, biography, Maori legends, and the famous Story Book Series, until the firm became the largest in the field of book printing and publishing in New Zealand."¹²⁴ As implied by the title of Ian McLaren and George Griffiths' 1984 bibliographic work, *Whitcombe's Story Books: A Trans-Tasman Survey*,¹²⁵ this series, that had arisen in 1908 from one of Whitcombe and Tombs' early school Readers series, the *Southern Cross Continuous Readers* (published from about 1888) was published and marketed on both sides of the Tasman. Intended to extend and supplement children's recreational reading by introducing them to a wide range of authors, both classical and contemporary, their important influence was in large part due to their low cost, the factor that enabled Whitcombe's Story Books to be affordable for families and schools alike.¹²⁶ In the colonial situation, fiction in particular had the ability to enrich life by indirect experience, especially where the emphasis was on the practical, and the immediate environment was somewhat culturally dull. By perceiving and leading the market in this way Whitcombe and Tombs had seeded the growth of children's publishing in Australasia. McLaren considers that the "phenomenal growth in the circulation of children's books in the late nineteenth century...was nowhere more evident than in New Zealand and Australia."¹²⁷

From the bibliography it is evident that one of the striking features of The Story Book Series, for which over twelve million copies had been printed by 1962, was the paper wrapper, which, in spite of the low cost, often had used colour to tempt the buyer. Speaking of their description of the wrappers, McLaren and Griffiths say:

With few exceptions, Whitcombe's Story Books were bound in paper wrappers, side-stitched in gathers for the longer texts, and saddle-stapled for the thinner booklets; they measured 183 x 125 mm....the standard wrapper description...e.g. "black & red on buff" indicates that the buff paper is printed in black and red....All have front wrapper illustrations unless noted otherwise, as those published in 1908.¹²⁸

However, although in the first years colour was confined to the paper of the wrapper, for instance for the 1908 title *The Last of the Barons* by Lord Edward Bulwer-Lytton, for which the wrapper was printed in black on brick red, the use of colour was later extended to colour printing in the body of the work, although not in general until later in the twentieth century, after the study period.

From the information provided in Betty Gilderdale's bibliography *A Sea Change: 145 Years of New Zealand Junior Fiction*¹²⁹ it can be seen that almost all illustrative colour printing for the fifty-one books she has listed over the period 1830 to 1914 was accomplished overseas, mainly in London, but it is apparent that few of these books were illustrated in colour until near the end of the period, in the second decade of the twentieth century. Many British

published books, annuals and serials for children were marketed in Australasia, including the well-known series the *Boy's Own Paper* (which began in 1879-1966) and the *Girl's Own Paper* a year later, both published by the Religious Tract Society. Although the weekly issues were typically illustrated in black and white, the annual volumes often contained a coloured frontispiece.¹³⁰ Gilderdale's bibliography shows that only five of the thirty-nine overseas-produced (other than Australian produced) books had been published in any place other than London. Twelve of the fourteen books that were produced in Australasia had been printed and published locally in New Zealand, and of these, four were from Wellington printers and two of the remainder from A.D. Willis of Wanganui. It appears that A.D. Willis' small book *Tiki's Trip to Town*, was an exception to the rule in that it had brought modest colour printing to the marketplace in 1893. (See chapter 8.) The 1912 title *Where Bell Birds Chime*, published by Whitcombe and Tombs in Christchurch, used up-to-date photomechanical illustration, but not yet in colour. One of the two titles published in Australia, Thomas Knox's unillustrated *The Boy Travellers in Australasia* had appeared around 1888 from Paul Flesch in Sydney. The other, *All Among the Faires*, written and illustrated by Ethel Jackson, was published by John Wyatt in Melbourne, possibly in 1910, showing that the occasional Australian junior fiction title was being marketed in New Zealand. Of the thirty-five titles that had been published in London, four were colour-printed, the first of these being *The Sun's Babies* by Edith Howes, which was published in 1910 in London by Cassell (and in Melbourne)¹³¹ with the colour illustrations by Frank Watkins.

Once again the small colonial New Zealand marketplace appears to have been a limiting factor economically speaking, and this applied also to the wider context of the Australasian market, and had meant that even in Australia, the larger neighbour, few children's books were published locally until nearly the end of the nineteenth century. Heather Scutter has observed:

In 1890 very few children's books were produced locally. From England came a plethora of alphabets and nursery rhymes, boys' and girls' papers, Christmas annuals, and reward books...Many of these reward books were attractive-looking, and were cloth-bound with gilt titles and a colour paper illustration pasted onto the cover.¹³²

As local publishing increased, it was "Angus & Robertson in Sydney [that became] the biggest publisher of children's books in Australia immediately before and after Federation."¹³³ Marcie Muir, an Australian specialist in the area of Australian children's books, has said that it was not until after the study period, however, that any really substantial locally produced children's books, for example the 1916 "large, handsome

book... Ida Outhwaite's *Elves and Fairies*, could be published and completely produced in Australia."¹³⁴

Before the 1890s the population of even the larger cities of Sydney and Melbourne was not large or stable enough to provide a market for the publication of childrens (*sic*) books, which in any case were being produced very competitively in nineteenth-century, industrialized England and exported to the Australian colonies.¹³⁵

Elves and Fairies, illustrated by Ida Rentoul Outhwaite, was published in Melbourne by Lothian with fifteen full-page colour plates.

However, more modest colour-printed childrens books had been locally printed in Australia from the eighteen-seventies, far earlier than had been the case in New Zealand. Marcie Muir cites a book published for children in Melbourne by George Robertson for Christmas 1871, *The Australian Christmas Story Book* by Cyrus Mason, as being one of the first to have been produced with locally printed coloured illustrations, also by Mason, although by modern standards these lithographs appear to have been "pallidly coloured."¹³⁶ Other early locally produced Australian childrens books to have appeared around the same time with colour illustrations executed by local printers were alphabet books, some produced cheaply using chromo-typographic methods similar to those used in England by, for example, Edmund Evans. Notable were those produced by the Calvert brothers, Samuel and William, for instance *The Australian A,B,C Book – Large Letters* that were first published in the early seventies. This was one of the Calverts' Australian Coloured Picture Books Series which was printed and published by W. Calvert in Melbourne, and which was advertised as "Calvert's Australian series of sixpenny picture books printed in colours".¹³⁷ In her book *A History of Australian Childrens Book Illustration*, Marcie Muir has discussed Australian children's books as pointers to progressive cultural developments in that country, saying of the Calverts' series:

The Calvert books are typical of most children's books of their period, cheaply but capably produced. They do not lose in comparison with the toy picture books published by Routledge, Dean, or other English publishers of similar books of the time. They are interesting as examples of what colonial children were given, and as examples of colonial skills in book production, illustrating and printing.¹³⁸

A later series of Australian children's books that was locally produced by Angus and Robertson began in 1910. For the first title, *Bushland Stories* by Amy Eleanor Mack, the illustrative artist was Lionel Lindsay, who is well-known for his copious black and white illustrations, both woodcut and etched. However, for *Bushland Stories* he had provided six colour plates. Although colour work was not typical of Lindsay, interestingly, it had been a colour experience which had been a remembered early inspiration to this gifted illustrator. Talking in 1967 of a fence that had been erected between his boyhood English home and a mansion next door, he recalled that it was

a six-foot fence, so well joined that it was impossible to discover whatever birds they might be that now startled the day with their cries. One day the providence mindful of a small boy's needs removed a knot at the exact right height, and to my amazed optic appeared splendid parrots, great blue and military macaws, and cages full of coloured birds, while peacocks strutted about as familiarly as barndoor fowls. The familiar magic of the *Arabian Nights* could do no better, and I feel certain that this vision of exotic beauty was the starting point for my engravings of birds in later life.¹³⁹

For the illustrations in the 1910 book, Lionel Lindsay had been able to call on his innate feel for colour—it had been his “deft use of colour” which had given these illustrative plates their effect.¹⁴⁰

For two children's books that appeared at the end of the study period in 1914, the publishers, again Angus and Robertson, had commissioned the Australian artist May Gibbs, the originator of the famous gumnut babies, to produce both the colour illustrations and the colour cover designs.¹⁴¹ They were the titles *Scribbling Sue* by Amy Mack, which appeared with five illustrations printed in colours, and *Gem of the Flat* by Constance Mackness, which had a colour-printed frontispiece. The appearance of some of these titles in the Dorothy Neal White Collection of children's books read by New Zealand children before 1940 also suggests that some Australian children's books had been marketed in New Zealand.¹⁴² Many of the books were received as gifts by their original owners. Examples are the titles that appeared from Angus and Robertson just before the First World War—*Gem of the Flat*, and an edition of *Dot and the Kangaroo* by Ethel C. Pedley which also had colour printed wrappers. Other such titles were *Cole's Funny Picture Book*, first published in 1879 by E.W. Cole in Melbourne and which by 1914 contained colour printed illustration, as well as the 1916 *Elves and Fairies*.

School Books in an Australasian Marketplace

Another group of books with which colonial youngsters were very familiar were school-books. As a genre school books have been dealt with by Hugh Price, who has noted that “they are influential because they set out currently accepted wisdom and they open a window on a shared experience of childhood that is hard to catch sight of in any other way.”¹⁴³ Like that for educational story books, the marketplace for school books, nearly all of which were also published by Whitcombe and Tombs, was Australasian, and some of their school books were not only published for Australian schools but were also published in Australia where their first branch was established in 1903 in Melbourne, with Bertie Whitcombe as manager.¹⁴⁴ Price considered that the dominance of this single publisher, which lasted from the early eighteen eighties until the second World War, brought a certain consistency to the marketplace for school books.

Their New Zealand publishing seems to have been tightly controlled from Christchurch, so that at any time their books in all subjects looked similar and were fairly uniform in spirit.¹⁴⁵

For this large group of locally published books, much of the printing was also locally accomplished, although if colour printing was required, overseas printers were evidently sometimes used, for instance, where maps were included, such as for geography books and school atlases. Thought by Price to have been “in a sense Whitcombe and Tombs’s first title” *First Lessons in Geography* was published in 1882 by Whitcombe and Company and printed by G. Tombs & Co. in Christchurch, although it had been written by a school inspector from London, Henry Hill. It contained diagrammatic illustration, but no colour, although by 1887 the revised, enlarged edition contained coloured maps. In 1884 J.J. Patterson’s *A Geography of New Zealand and Australia Including Tasmania, New Guinea and the Fijis, With Four Maps: Adapted to the Requirements of the Public Schools of New Zealand* had appeared. The colour maps were double-paged.¹⁴⁶ From the copy of the first edition held in Dunedin Public Library, it was verified that these maps were printed by Whitcombe and Tombs. (Plate 40.)

Hugh Price considers that the improvement in the illustrative content was a significant change that occurred for geography texts from about the turn of the century, and this had included an improvement in the maps and diagrams and half-tones presented.¹⁴⁷ However, maps printed as colour plates in atlases published to 1914 (six in all) for use in school had been mostly printed in Britain, even the atlas published by A.D. Willis, *Willis’s Australian World Atlas* by J.G. Bartholomew, for which the “34 pages of full colour maps” were “apparently printed by John Bartholomew and Co., Edinburgh” around 1900.¹⁴⁸ However, a 23 x 18.5 cm. atlas, the *New Zealand School Atlas of Coloured and Photo-Relief Maps*, (undated) which has been placed by Price in this group, contains some locally colour-printed maps. Although most were attributed to the British McDougall’s Educational Co. Ltd., the New Zealand maps, both colour and relief, were printed by Whitcombe and Tombs. Although it was possible to have printed an atlas in colour in New Zealand, even colour printers such as Willis, who had printed chromolithographed books, saw extensive colour printing for books as a distinct market risk, and the illustrative emphasis at this firm had later turned to the photographic—mainly to use of black and white half-tones. (See chapter 8.) But also, to a certain extent, the New Zealand tradition was to have atlases published overseas, and this practice probably had its own momentum.

Plate 40: ‘New Zealand North I.’

Published in J.J. Patterson’s *A Geography of New Zealand and Australia Including Tasmania, New Guinea and the Fijis, With Four Maps*, 1st ed. (Christchurch: Whitcombe and Tombs Ltd., 1884.) Note: In this reproduction the colours are slightly duller and the pinks and blues lighter than in the original.

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Ref. No.: McNab New Zealand Room, APL.

However, colour printed illustration was integral to Whitcombe and Tombs' *Southern Cross Series* 'Pacific Readers' at least around the last years of the study period. For instance, for this series, four colour printing was in use for the purpose in 1911, the year that the Pacific Infant Readers and Primers Series began.¹⁴⁹ One "first infant reader" examined from this period featured charming illustrations that were integrated with the text on the same page and printed via four colour relief printing, while another featured chromolithographic colour, simplified to rely on red, blue, yellow and black as the basic palette.¹⁵⁰ (Plate 41.) From the first, the Southern Cross Series of school readers had set an example for local printers, particularly with regard to the standard of illustration. When they had first appeared in 1888, R.C. Harding had commented in *Typo* after examining *The First Standard Reader*. His judgement was that although the content of the illustration was wanting, in that, of thirty-two engravings, only one, representing two shearers at work, "had any connexion with life and its surroundings in our own land," nevertheless the bookwork and the engravings were good. He said:

With so much wretched bookmaking in the colony, it is quite a relief to see the work of a skilled compositor, with paper and presswork in keeping...The engraving and printing are so good, and so unlike anything we have seen produced in the colony hitherto, that we should have felt sure they were done in London, but for the publishers' express statement that all the work was executed in their own establishment.¹⁵¹

At this time, colour illustration was in use for similar Australian primers, as seen, for instance, in the *Tasmanian Illustrated First Primer* that was printed and published by the Education Department in Hobart, also around 1911, for which the simple chromolithographic colour had been printed using primary red, blue and yellow to accomplish the copious illustration.

Further Variety in Locally Colour-Printed Books

Although the use of colour printing for locally published books was far from the general rule, the small proportion of colour printing that was carried out in New Zealand for local books had often been for the presentation of an illustrative map, sometimes in sheet form, as had been the case from the beginning of chromolithographic colour printing in New Zealand, an example from the eighteen seventies being the 1879 publication by Louis Blackwell *Christchurch Water Supply. A Report...* which contained two colour maps folded in a pocket,¹⁵² and which was printed by a local firm with the expertise to carry out the chromolithography, G. Tombs. Towards the end of the nineteenth century some items that were produced for the tourist industry were being printed in colours to attract the eye, for example an 1898 guide-book for the Auckland region, one of a series issued by the Government Tourist Department. For this item, red had been used in a variety of ways to add a decorative element simply: the borders were printed in red, and red was also used as

the background to some of the lettering, and for designs within the lettering. As well as Willis in Wanganui, Henry Brett in Auckland was one of the private New Zealand printing firms that began sometimes to use chromolithography to add colour from the press for book illustration. For instance, by 1892, Brett had brought out *Frontier Life: New Zealand* with the chromolithographic illustration, 'Survey Camp, Waimate Plains' printed at the Star Litho Works, Auckland, from a sketch by the author of the book, E. S. Brookes. Just after the turn of the century, in 1901 the book printed by Fergusson & Mitchell *Maori Art* by A. Hamilton had appeared with some colour illustrations.

A 25 x 18.3 cm. booklet of only sixteen pages, printed in colour by the Christchurch Press Company, was likely to have been deemed worthy of the extra cost and effort for the colour lithography because of its special occasion nature: it was the 1906/07 *New Zealand International Exhibition Souvenir* that was produced in a landscape format with card covers costing one shilling. It contained six chromolithographed views of the Exhibition, each with an accompanying description, and all reproduced from watercolour sketches by Phil. R. Presants. The exhibition occupied fourteen acres of buildings on two hundred acres of grounds, with features such as a "model Rotorua," the subject of one of the chromolithographs. A two page 'Bird's Eye View of the Exhibition' occupied the centrespread, with two vignettes in the bottom corners – one showing people flocking to the exhibition, and the other depicting a Maori whare. Whereas the front cover featuring a Maori carving design and the back cover carrying an advertisement were in a simple colour scheme of blues, brown and gold, the views inside were executed in around eight colours, primarily based on yellows, blues and reds. Stipple shading and overprinting had contributed the darker tones, and a brown outline key had been printed last. Overprinting had been used also to form further colours, such as blue over pink to give purple, and grey, then red over yellow to give burnt orange: this was clearly a production intended to reflect the promotional effort that had been put into the exhibition itself.¹⁵³

By 1911, the new revised edition of a book by Thomas Leys that came from the Brett Printing and Publishing Company contained illustrations that can be seen to represent a variety of the techniques by then being employed by local printers to print the graphics required for the illustration of the reading matter of the day. The title *A Weird Region: New Zealand Lakes, Terraces, Geysers, and Volcanoes, With an Account of the Eruption of*

Plate 41: Four-colour relief illustration for text 'My Rose-bush.'

Printed by Whitcombe and Tombs, Christchurch.

Published in *First Infant Reader*. The Pacific Infant Readers, Southern Cross Series. (Christchurch: Whitcombe and Tombs, 1911), 22. Ref. G 34627.

rose-bush?" said Mabel Wills to Ivy Brown. "There are such a lot of roses on it."

2. When the girls went to the garden, they found the bush had pure white roses all over it.

3. In a rose-bed near by, there were other rose-bushes. Some of them were red, some pink, and some were yellow.

4. One bush had moss on the outside of all its buds. Mabel told Ivy it was her mother's moss-rose.

5. Mabel said she would pull some roses from her own white rose-bush. There were so many of them. Some grew so high that Ivy had to place a big stone for Mabel to stand on.

6. She took great care when she pulled the roses not to prick her hands with the thorns.

Tarawera, originally published in 1887, was chiefly illustrated with photographic half-tones in black and white (for which the photographers of the originals had in the main been acknowledged), but that also incorporated a wood-engraved illustration. However, the largest illustration, the frontispiece, which was a two-page spread, was a chromolithograph that had also been produced at the "Brett Printing Co. Auckland", as acknowledged on the bottom right-hand corner. Compared with the chromolithographs produced, for example, for the Featons' *Art Album* or for Maskell's *An Account of the Insects Noxious to Agriculture and Plants in New Zealand*, this appears as a rather crude production, printed using mainly middle tones in yellows, blues and browns, with overprinting of blue on yellow to give green. This was more akin to the coarse-grained chromolithographs being produced at that time for mass circulation, comparable, for example, to some of the lower standard productions that were produced in association with the weekly newspaper issues.

The war that began at the end of the period under study saw colour illustration produced for a book with an entirely different purpose. Although strictly speaking published by Whitcombe and Tombs Ltd., in Melbourne and Christchurch, after the end of the period in 1915, the *Countess of Liverpool's Gift Book of Art and Literature* was a sign of the event that was causing a cultural shift by reactivating emotional ties with Britain, and at the same time stimulating within New Zealand a spirit of cooperation, not only with Britain but also with neighbouring Australia. The statement on an un-numbered page at the front, is indicative: "The entire profits from the sale of this book will be utilised for the benefit of the sick and wounded soldiers of New Zealand." A further page, bearing the insignia of Government House, Dominion of New Zealand, intimated that "all letterpress and illustration has been contributed free." The illustrations that were included in this book also exemplify the shift that had taken place in print culture to allow new ways of adding colour to the printed page, and that by then had taken hold for the production of locally printed books. The frontispiece is a four-colour halftone of a photograph from Schmidt's Studio, Auckland, entitled 'The Countess of Liverpool'. Although some illustration, for instance a half-tone of a troop-ship, was in black and white, much was colour-printed via the newer techniques, the three and four colour half-tone processes. Although some of the illustrations were missing from the copy examined, some examples remaining were a reproduction of the painting 'The Veteran' by Cecil Kelly opposite page 32; 'In the Heart of the Bush' by John Ford Paterson opposite page 80; and 'A Pastoral' by Charles Conder, opposite page 96. All were reproduced on glossy paper by photomechanical colour printing, and inserted on thin green/brown card pages.

- ¹ J.D. Mollon, 'Primate Colour Vision', in *Readings on Color*, vol. 1, 'The Science of Color', Alexander Byrne, and David Hilbert, eds. (Cambridge, Mass.: MIT Press, c1997), 384-385.
- ² Alexander Byrne, and David Hilbert, eds. *Readings on Color*, vol. 1, 'The Science of Color': suggestions for further reading in the area of 'Comparative Color Vision and Evolution', 458-459.
- ³ Gael Newton, *Shades of Light: Photography and Australia 1839-1988*, with essays by Helen Ennis and Chris Long and assistance from Isobel Crombie and Kate Davidson (Canberra: Australian National Gallery: Collins Australia, 1988), 179: note by Gael Newton: "Robert Holden's bibliography, *Photography in Colonial Australia: The Mechanical Eye and the Illustrated Book* (Sydney: Hordern House, [ca.1988]), lists some two hundred works in this genre."
- ⁴ Gael Newton, *Shades of Light*, 36-38.
- ⁵ *Ibid.*, 42.
- ⁶ *Ibid.*, 180, endnote 20.
- ⁷ *Ibid.*, 40.
- ⁸ *Ibid.*, 44.
- ⁹ *Ibid.*, 39.
- ¹⁰ Ruth Zubans, 'At Charterisville in the 1890s: Phillips Fox and Tudor St. George Tucker', in *Heidelberg to Heide: Creating an Australian Landscape 1850-1950*, curated by Kelly Gellatly and Ted Gott with contributions from Helen Topliss, Mary Eagle and Ruth Zubans (Bulleen: Heide Museum of Modern Art, 2001), 42.
- ¹¹ *Ibid.*, 44.
- ¹² Violet Teague, quoted by William Moore in *The Story of Australian Art* (Sydney: Angus and Robertson, 1934), 1, 79.
- ¹³ Brian W. Marshall, 'New Zealand Maps Published in 19th Century Periodicals', *Occasional Publication, Department of Geography, University of Auckland*, no. 41 (1998).
- ¹⁴ *Ibid.*, 2.
- ¹⁵ J.T. Thomson, 'Ethnographical Considerations on the Whence of the Maori', in *Transactions and Proceedings of the New Zealand Institute*, 4 (1871): foll. 32.
- ¹⁶ *The Farmer's Circular and Weekly Report*, no.89 (1883): foll. 2.
- ¹⁷ *New Zealand Country Journal*, no.7 (1883): foll. 162.
- ¹⁸ Marshall, 'New Zealand Maps Published in 19th Century Periodicals', 95: 1893-04.
- ¹⁹ R.P. Hargreaves, *Maps in the Appendices to the Journals, House of Representatives: A Chronological Listing, Parts I & II* (Dunedin: University of Otago Press, 1968); R.P. Hargreaves, *Maps in New Zealand Provincial Council Papers* (Dunedin: University of Otago Press, 1964).
- ²⁰ E.M. & D.G. Ellis, *Early Prints of New Zealand, 1642-1875* (Christchurch: Avon Fine Prints, 1978), 169.
- ²¹ *Ibid.*, 173-176.
- ²² Edward Dobson, *Pioneer Engineering: A Treatise on the Engineering Operations Connected with the Settlement of Waste Lands in New Countries* (London: Crosby Lockwood and Co., 1877), vi.
- ²³ Ellises, *Early Prints of New Zealand, 1642-1875*, 177.
- ²⁴ Alexander Turnbull Library, Exhibition sponsored by the Goethe Institute of Wellington, 'From George Forster to Denis Adam' 200 Years of German-New Zealand Connections', December 2001.
- ²⁵ John Gully, *New Zealand Scenery: Chromo-lithographed After Original Water-color Drawings by John Gully; With Descriptive Letterpress by Julius Von Haast* (Dunedin, N.Z.: Henry Wise; London: Marcus Ward, 1877), [1]. (National Library of New Zealand Copy.)
- ²⁶ Alexander Turnbull Library, Drawings and Prints, item, A-149-001.
- ²⁷ Julius von Haast, *Report on the Headwaters of the River Rakaia With Twenty Illustrations, A Map and Three Appendices* (Christchurch: The Press Office, 1866), plate 11. Note: the date of 1867 appears on the cover of the report.
- ²⁸ Edward Dobson, *Report to the Secretary for Public Works upon the Practicability of Constructing a Bridle Road through the Gorge of the Otira...* (Christchurch: the Press Office, 1865), plates: Alexander Turnbull Library, Drawings and Prints Ref: A-004-010/036.
- ²⁹ Julius Haast, *Report on the Formation of the Canterbury Plains With a Geological Sketch-Map and Five Geological Sections* (Christchurch: The Press Office, 1864), preamble.
- ³⁰ *Appendices to the Journals of the House of Representatives of New Zealand (AJHR)* (Wellington: The Government Printer, 1858-1861): E-1C, 4.
- ³¹ R.P. Hargreaves, *Maps of New Zealand Appearing in British Parliamentary Papers* (Dunedin, University of Otago Press, 1962); R.P. Hargreaves, *Nineteenth Century British Hydrographic Charts of New Zealand* (Dunedin, University of Otago Press, 1969).

- ³² G.J.R. Linge, 'Manufacturing in New Zealand; Four Years in a Century of Growth', chap. 8 in *Land and Society in New Zealand: Essays in Historical Geography*, ed. by R. F. Watters for the Wellington Branch, New Zealand Geographical Society (Wellington, A. H. & A. W. Reed [1965]), 142.
- ³³ Jeanine Graham, 'The Pioneers', Chap. 3 in *The Oxford Illustrated History of New Zealand*. 2nd ed. (Auckland: Oxford University Press, 1996), 52.
- ³⁴ Anna Rogers and Max Rogers, *Turning the Pages: The Story of Bookselling in New Zealand*, foreword by Fiona Kidman (Auckland: Reed for Booksellers New Zealand, 1993), 13.
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- ³⁶ Martyn Lyons, 'Britain's Largest Export Market', chap. 2 in Martyn Lyons and John Arnold, eds., *A History of the Book in Australia, 1891-1945: A National Culture in a Colonised Market* (St. Lucia, Qld.: University of Queensland Press, 2001), 25.
- ³⁷ John McIndoe, 'A Publisher in New Zealand', unpublished address to the Otago Branch, NZLA, n.d. University of Otago, Hocken Library, Ref., Misc-MS-0031.
- ³⁸ A.H. McLintock, ed., *An Encyclopaedia of New Zealand* (Wellington: Government Printer, 1966), 884.
- ³⁹ J.E. Traue, 'The Two Histories of the Book in New Zealand', in *BSANZ Bulletin Special Issue*, 25 no.1 & 2 (2001): 16.
- ⁴⁰ Peter H. Hughes, 'Cold, Naked, Pitiless Truth; 19th Century Pamphlets and New Zealand Print History', in *Turnbull Library Record*, 31 (1998): 20.
- ⁴¹ *Ibid.*, 24.
- ⁴² Auckland Public Library, *Printed in Auckland: Book Production and Design: Past and Present: An Exhibition Arranged by the Auckland Public Libraries on the Occasion of the Auckland Festival, 1956* ([Auckland: The Library, 1956]), 5.
- ⁴³ Charles D. Barraud, *New Zealand: Graphic and Descriptive*, illus. by C.D. Barraud; ed. by W.T.L. Travers (London: Sampson Low, Marston, Searle and Rivington, 1877), preface. (Copy: Victoria University Library, J.C. Beaglehole Room.)
- ⁴⁴ John Gully, *New Zealand Scenery: Chromo-lithographed after Original Water-color Drawings by John Gully; With Descriptive Letterpress by Julius Von Haast* (Dunedin: Henry Wise; London: Marcus Ward, 1877). (Copy: Victoria University Library, J.C. Beaglehole Room.)
- ⁴⁵ Julius Haast, in *New Zealand Scenery*, [2].
- ⁴⁶ David Blair, *The History of Australasia, From the First Dawn of Discovery in the Southern Ocean to the Establishment of Self-government in the Colonies, Comprising the Settlement and History of New South Wales, Victoria, South Australia, Queensland, Western Australia, Tasmania, and New Zealand, Together with Some Account of Fiji and New Guinea* (Glasgow [etc.]: McGready, Thomson & Niven, 1879), preface. (Copy: J.C. Beaglehole room, Victoria University.)
- ⁴⁷ Walter L. Buller, *A History of the Birds of New Zealand* (London: John van Voorst, 1873;1888), plate. (Alexander Turnbull Library: Ref: PUBL-0012-48.)
- ⁴⁸ J.R.H. Andrews, *The Southern Ark: Zoological Discovery in New Zealand 1769-1900* (Auckland: Century Hutchinson, 1986), 194.
- ⁴⁹ *Typo*, 3 (June 1889): 63.
- ⁵⁰ Walter L. Buller, *Manual of the Birds of New Zealand* (Wellington: Govt. Printer, 1882), preface.
- ⁵¹ Geoffrey Wakeman, *The Production of Nineteenth Century Colour Illustration* (The Plough Press, 1976), 3-4.
- ⁵² Bruce Sampson has included a chapter (12) on the botanical aspect of this book in his *Early New Zealand Botanical Art* (Auckland: Reed/Methuen, 1985), 102-108.
- ⁵³ Mrs. Charles (Georgina) Hetley, *The Native Flowers of New Zealand, Illustrated in Colours in the Best Style of Modern Chromo-litho Art, From Drawings Coloured to Nature* (London: Sampson Low, Marston, Searle, and Rivington, 1887-1888), prospectus. (Copy: Victoria University Library, J.C. Beaglehole Room.)
- ⁵⁴ *Ibid.*, preface.
- ⁵⁵ *Ibid.*, 8.
- ⁵⁶ John Muir, 'Headpieces and Fairytales: Wellington's Lyon and Blair 1874-1894', unpublished bibliography (Victoria University of Wellington, 1998), vii.
- ⁵⁷ *Typo*, 6 (January 1892): 11.
- ⁵⁸ *Typo*, 1 (February 1887): 11.
- ⁵⁹ Tolla Williment, *150 Years of Printing in New Zealand* (Wellington: Government Printing Office, 1985), 26.
- ⁶⁰ R.P. Hargreaves and T.J. Hearn, *New Zealand in the Mid-Victorian Era: An Album of Contemporary Engravings* (Dunedin: McIndoe, 1977), introduction.
- ⁶¹ *Ibid.*

⁶² Ibid.

⁶³ Maurice Rickards, *The Encyclopedia of Ephemera: A Guide to the Fragmentary Documents of Everyday Life for the Collector, Curator and Historian*; ed. and completed by Michael Twyman; with the assistance of Sarah du Boscq de Beaumont and Amoret Tanner (London: British Library, 2000), 15.

⁶⁴ D. Hansen, *The Directory Directory: The Family, Local and Social Historian's Guide to Contents and Holdings of New Zealand Almanacs, Business, Postal and Telephone Directories, 1842-1960* (Wellington: D. Hansen, 1994).

⁶⁵ Marshall, 'New Zealand Maps Published in 19th Century Periodicals', 38-45.

⁶⁶ *New Zealand Official Year Book* (Wellington: Government Printer, 1901), 604.

⁶⁷ Williment, *150 Years of Printing in New Zealand*, 31.

⁶⁸ *Cyclopedia of New Zealand: Industrial, Descriptive, Historical, Biographical Facts, Figures, Illustrations, 1897-1908* (Wellington etc.: Cyclopedia Co., 1897-1908), 2, 406.

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⁷⁰ James Hector, *Handbook of New Zealand*, 3rd ed. rev. (Wellington: Government Printer, 1883), preface. (Copy: Victoria University Library, J.C. Beaglehole Room.)

⁷¹ John Muir, 'Headpieces and Fairytales', 13.

⁷² Ulla Ehrensward, 'Color in Cartography: A Historical Survey', in David Woodward, ed., *Art and Cartography: Six Historical Essays* (Chicago: University of Chicago Press, c1987), 139.

⁷³ W.A. Glue, *History of the Government Printing Office* (Wellington: Government Printer, 1966), 62.

⁷⁴ *New Zealand Official Year Book*, (1897), preface.

⁷⁵ Andrews, *The Southern Ark*, 169.

⁷⁶ Ibid., 108n.

⁷⁷ *Transactions and Proceedings of the New Zealand Institute* (Wellington: James Hughes): 2 (1869), iv.

⁷⁸ Reproduced in Andrews, *The Southern Ark*, 170.

⁷⁹ Andrews, *The Southern Ark*, 170.

⁸⁰ *Transactions and Proceedings of the New Zealand Institute*, 7 (1874): plate XXIV opp. 370.

⁸¹ Andrews, *The Southern Ark*, 175.

⁸² *Transactions and Proceedings of the New Zealand Institute*, 19 (1886): opp. 40.

⁸³ Ibid., 28 (1896): 383-395; plates 25-35.

⁸⁴ Andrews, *The Southern Ark*, 189n.

⁸⁵ Ibid., 194.

⁸⁶ A.G. Butler, 'The Butterflies of New Zealand' in *Transactions and Proceedings of the New Zealand Institute*, 10 (1877), 279.

⁸⁷ 'Catalogue of the Butterflies of New Zealand' with a short preface by John Enys; reprinted from vol. X of the *Transactions of the New Zealand Institute*; incorporates Arthur Butler, 'On the Butterflies of New Zealand', and 'Account of an Additional Species' by R. W. Fereday, reprinted from the *Entomologist's Monthly Magazine*, XVI (Christchurch: G. Tombs and Co., 1880), 19. (Copy: Victoria University Library, J.C. Beaglehole Room.)

⁸⁸ Proof plates with J.D. Enys' pencil annotations are held in the Alexander Turnbull Library: Ref: A-009-001/082.

⁸⁹ John Buchanan, *Manual of the Indigenous Grasses of New Zealand* (Wellington: Government Printer, 1880), preface [iii]. (Copy: Victoria University Library, J.C. Beaglehole Room.)

⁹⁰ F. Bruce Sampson, *Early New Zealand Botanical Art*, (Auckland: Reed/Methuen, 1985), 91.

⁹¹ Buchanan, *Manual of the Indigenous Grasses of New Zealand*, iv.

⁹² Ibid., preface, [iii].

⁹³ Ibid., 51.

⁹⁴ A.G. Bagnall, ed., *New Zealand National Bibliography to the Year 1960* (Wellington: Government Printer, 1969-1985), entry 732.

⁹⁵ John Buchanan, *The Indigenous Grasses of New Zealand*, illustrated by John Buchanan (Wellington: The Government Printer, 1880), preface.

⁹⁶ A resident, comp. for the New Zealand Shipping Company, *New Zealand: Its History, Institutions, and Industries: A Narrative with Statistics* (London: Printed by P. Soman, 1884), 154.

⁹⁷ *Cyclopedia*, 1, 725.

⁹⁸ *Typo*, 2 (27 October 1888): 106.

- ⁹⁹ E. H. and S. F. Featon, *The Art Album of New Zealand Flora: Being a Systematic and Popular Description of the Native Flowering Plants of New Zealand and the Adjacent Islands, Volume 1* (Wellington: Printed and published at the Office of Messrs. Bock & Cousins, 1889), page following x of preface. (Copy: Victoria University Library, J.C. Beaglehole Room.)
- ¹⁰⁰ Sampson, *Early New Zealand Botanical Art*, 93, 95.
- ¹⁰¹ *Ibid.*, 94.
- ¹⁰² Copies seen were at the Alexander Turnbull Library, reference, PUBL-0025 ; and at Victoria University Library, J.C. Beaglehole Room, reference, Fildes 1488.
- ¹⁰³ Bamber Gascoigne, *How to Identify Prints: A Complete Guide to Manual and Mechanical Processes From Woodcut to Ink Jet* (London: Thames and Hudson, 1986), 28c.
- ¹⁰⁴ Sampson, *Early New Zealand Botanical Art*, 89.
- ¹⁰⁵ *Ibid.*, 102-103.
- ¹⁰⁶ Featons, *The Art Album of New Zealand Flora*, preface, ix.
- ¹⁰⁷ Sampson, *Early New Zealand Botanical Art*, 94.
- ¹⁰⁸ The New Zealand publisher was H.D. Jackson of Nelson.
- ¹⁰⁹ See Sampson, *Early New Zealand Botanical Art*, 97-101.
- ¹¹⁰ Government Printing Office, correspondence files, "Featons' Art Album", Jas. H. Stevens (Hon. Life Secretary of the Citizen's Lunch Club) to the Hon. Minister for Education, 1/10/1938. National Archives Head Office, Wellington, ref: GP1 5/161/66[A129]
- ¹¹¹ "Featons' Art Album", 'Memorandum for: the Under-secretary (Publications Committee, Internal Affairs Department), 21/2/1939.
- ¹¹² "Featons' Art Album", Jas. H. Stevens (Hon. Life Secretary of the Citizen's Lunch Club) to the Hon. Minister for Education, 1/10/1938.
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- ¹¹⁶ Alexander Turnbull Library, Ephemera Collection, item, B-BOOK-1890s-01.
- ¹¹⁷ Victor Crittenden, *A History of Australian Gardening Books and A Bibliography 1806-1950*, Library Bibliography Series No. 11 (Canberra: Canberra College of Advanced Education Library, 1986), 91.
- ¹¹⁸ William Southgate in Susan Bartel, ed., *Working Titles: Books that Shaped New Zealand*, Janet Snell, photographer (Wellington: National Library of New Zealand, c1993), entry, *Yates Garden Guide*.
- ¹¹⁹ Crittenden, *A History of Australian Gardening Books*.
- ¹²⁰ *Ibid.*, 205.
- ¹²¹ *Ibid.*, 76.
- ¹²² *Ibid.*, 206.
- ¹²³ *Ibid.*, 210: "manuscript note on the Mitchell library copy."
- ¹²⁴ Tolla Williment, *150 Years of Printing in New Zealand*, 33.
- ¹²⁵ Ian McLaren and George J. Griffiths, *Whitcombe's Story Books: A Trans-Tasman Survey* (Melbourne: University of Melbourne Library, 1984).
- ¹²⁶ National Library of New Zealand, *Fabulous and Familiar: Children's Reading in New Zealand Past and Present*, comp. by Mary Atwood et al. (The Library: Wellington, 1991), 17.
- ¹²⁷ McLaren and Griffiths, *Whitcombe's Story Books*, vii.
- ¹²⁸ *Ibid.*, xi.
- ¹²⁹ Betty Gilderdale, *A Sea Change: 145 Years of New Zealand Junior Fiction* (Auckland: Longman Paul, 1982).
- ¹³⁰ Marcie Muir, *A History of Australian Childrens Book Illustration* (Melbourne: Oxford University Press, 1982), 43.
- ¹³¹ National Library of New Zealand, Te Puna [database online] (Wellington: The Library, 1999), record no.4164329; Bagnall, entry 1367; held, National Library of New Zealand, National Children's Collection.
- ¹³² Heather Scutter, 'Children's Literature', chap. 17 in Martyn and John Arnold, eds., *A History of the Book in Australia, 1891-1945: A National Culture in a Colonised Market* (St. Lucia, Qld.: University of Queensland Press, 2001), 298.
- ¹³³ *Ibid.*, 300.
- ¹³⁴ Marcie Muir, *A History of Australian Childrens Book Illustration*, 153.
- ¹³⁵ *Ibid.*, 23.
- ¹³⁶ *Ibid.*, 22-23.
- ¹³⁷ *Ibid.*, 34.

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- ¹³⁸ Ibid., 36.
- ¹³⁹ Lionel Lindsay, *Comedy of Life: An Autobiography, 1874-1961*, with a foreword by Peter Lindsay (Angus and Robertson: 1967), 7.
- ¹⁴⁰ Marcie Muir, *A History of Australian Childrens Book Illustration*, 75.
- ¹⁴¹ Ibid., 21.
- ¹⁴² The Dorothy Neal White Collection is held by the National Library of New Zealand.
- ¹⁴³ Hugh Price, *School Text Books Published in New Zealand to 1960* (Palmerston North: Dunmore Press, 1992), 8.
- ¹⁴⁴ McLaren and Griffiths, *Whitcombe's Story Books*, 205.
- ¹⁴⁵ Ibid.
- ¹⁴⁶ Bagnall, ed., *New Zealand National Bibliography to the Year 1960*, entry 4480.
- ¹⁴⁷ Price, *School Text Books Published in New Zealand to 1960*, 80.
- ¹⁴⁸ Ibid., 87.
- ¹⁴⁹ The series continued until 1929: item 25/52-25/59 in Price.
- ¹⁵⁰ Collection held at the home of Hugh Price and Beverley Randell, 24 Glasgow St, Kelburn.
- ¹⁵¹ *Typo*, 2 (June 1888): 49.
- ¹⁵² Bagnall, ed., *New Zealand National Bibliography to the Year 1960*, 1, entry 523.
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SECTION V

New Zealand Colour Print Products in the Marketplace

CHAPTER 10

NEW ZEALAND IN COLOUR:

SPECIAL NUMBERS FROM THE NEW ZEALAND WEEKLIES:

A GENRE STUDY

Introduction

The New Zealand weekly newspapers, which could also be considered periodicals, came into being largely in tandem with the dailies. The origin of an early one that began on July 8th 1865, the *Canterbury Times*, was explained in an historical article that appeared in its pages in 1895 as initially being to cater for the rural readership. "After the *Lyttelton Times* became a daily paper, it was found that many of its country readers could not share the advantages resulting from the change; and to supply them with all the most important news, together with a quantity of general reading matter, it was determined to issue a weekly paper, and accordingly, the *Canterbury Times* was established."¹ The first issue appeared on July 8th 1865. In time many of these papers became New Zealand ambassadors overseas, assisted by comparatively inexpensive overseas postage rates for newspapers as opposed to internal rates. R.C. Harding commented in *Typo* in 1891 on the value of such papers in raising the profile of the country:

I am personally in favour of newspapers being carried free if the revenue can be sacrificed...as respects the mother country, I look upon every newspaper sent home as the cheapest and best advertisement New Zealand can get.²

The weeklies as a genre prospered, and by 1900 there were 22 in circulation including the *Auckland Weekly News* and the *New Zealand Graphic* in Auckland, in Wellington the *New Zealand Mail* and the *New Zealand Free Lance*, and in the South Island the *Weekly Press* and the *Otago Witness*.³ (See figure 8: 464) To mark the annual festive season, the newspaper proprietors often included special features in the issue due at Christmas, and for the readership this developed into an expectation, as the Christmas numbers became a regular annual treat.

In 1891, R.C. Harding observed acerbically that a projected Wanganui periodical, entitled *A Woman's Paper*, which was to be of a "serious and educating character," would not do well for the reason that in New Zealand "high-class periodicals are read, admired and appreciated in every way but one. The people will not subscribe to them."⁴ Since it was the New Zealand custom to buy newspapers it was to be expected that the weeklies associated

with them were of the popular variety destined for the wider general market. It was also understandable that it was calculated that the use of attractive colour would prove to be beneficial for circulation figures. In comparison to more costly periodicals the weeklies were perceived to be good value. In 1891, R.C. Harding had enthusiastically reported on one of the prominent New Zealand Christmas annuals, saying “the *Auckland Weekly News* Christmas number contains 56 large pages, and a coloured supplement: ‘View on the Waikato River.’ It is a wonderful sixpennyworth”.⁵ In 1888, the year of the introduction of a chromolithographed print as a part of the annual Christmas number, the terms of subscription were:

£1 2s 6d per annum, in advance, or 6s per quarter, which rates include the cost of postage and carriage within the Colony: if credit is given, 6s 6d per quarter. Single copies 6d. Subscribers will observe that by paying for the year in advance they effect a considerable saving...to avoid the large amount of book-keeping which is rendered necessary by quarterly accounts.⁶

In 1892, Harding reported that “the principal New Zealand weekly newspapers have this year shown more than ordinary enterprise in the production of extra Christmas numbers.”⁷ A part of this enterprise was the use of colour printing as a feature, especially as an element of the graphic communication within their pages.

It has been pointed out in *Book & Print*, that the weeklies are a genre which “were influential ... and require further study.”⁸ It is appropriate to look more closely at the place of colour printing within this genre. An examination of several runs of such annuals and other special numbers associated with the New Zealand weeklies reveals that, once established, the element of colour continued throughout the study period and beyond. Because particularly the special annual copies were being posted overseas, by virtue of its capacity to make an immediate visual impact, colour as both educator and advertisement was becoming an important and ongoing part of visual communication concerning this Antipodean colony.

A Representative of the Genre: The *Auckland Weekly News*

It is apposite to closely study an example from the genre to follow graphic developments that occurred in New Zealand in this type of publication. Since the *Weekly News* was one of the best known and longest survivors for which runs are available, it has been chosen for examination of the graphic trends that led to the eventual appearance of regular colour.

The *Weekly News* was originally established on 13th November 1863 alongside the daily paper the *Southern Cross*, the first issue appearing on 28th November of that year.⁹ After two title changes, it merged with the weekly that had been associated with the *New Zealand Herald*, a paper reported by 1897 its own pages to have “a wide circulation in the Mother

Country,” and “considered to be the representative newspaper of the colony...” The *Auckland Weekly News* was said by that time to have “like the *Herald* concerned itself more with measures that seemed of benefit to the general body of settlers in the colony, than with any political party that might have the public ear....”¹⁰

From the year 1877 the *Auckland Weekly News* was published by Wilson & Horton Limited, and after this the illustrative content began to increase and develop. It was in conjunction with this side of the paper that the use of colour was in evidence by 1888. There had already been precedents in other papers on both sides of the Tasman, and trans-Tasman image trading had also played a part. Ian Morrison has noted that images used in the illustrated newspapers that appeared in papers on each side of the Tasman, sometimes appeared under different titles. For instance, the colour image ‘Haunt of the Lyre Bird,’ for which the Melbourne artist was Louis Buvelot, and the wood engraver Samuel Calvert had appeared on both sides of the Tasman at about the same time—it was published for the *Illustrated Australian News* in the issue for 24 December 1879, and as ‘Picnicing Spot in New Zealand’ in the *Illustrated New Zealand Herald* on 31st December 1879.¹¹ In the following year a lithographic print had appeared in colour in December 1880 on the other side of the Tasman as a supplement to the *Illustrated Australian News*. Entitled ‘The Teamsters Christmas Eve’ this reproduction of a painting by James Curtis showed a campfire scene, the lithographers being Sands and McDougall. An example of an early New Zealand precedent featuring colour was the [‘Map of Manawatu-Wellington’] presented in printed colour as a supplement to the July 14th 1882 issue of the *New Zealand Times*.¹² Wilson & Horton had also previously presented tinted lithographs in a supplement to the *New Zealand Herald* at least by 21st June 1886. (See below.)

R.A. McKay noted that Wilson & Hortons’ two newspapers, the *Herald* and the *Weekly News* expanded around the time that revenue from the development of the dairy industry was bringing both prosperity and an increase in population to the north. This was a fortunate coincidence, for the greater emphasis on graphics and colour led to greater production expenses, resulting from the mid-nineties in an increase in prices which would have been more affordable to a prosperous community. In 1903 Sir Henry Horton had taken over the management of the firm after the death of all three of the original partners, and the ever growing emphasis on the many uses of the image reflected his particular interest in newspaper illustration. In pursuit of sales to the mass market, plan to produce such a weekly paper was becoming a costly consideration only possessed by the larger commercial

firms as they strove to capture the readership by providing what was perceived as attractive to it, and that would therefore give a market edge.

Looking back over the experience of mass circulation papers from the vantage point of the mid twentieth century has suggested that in addition to human interest and feature stories, what the general public *had* wanted could be summed up as being graphics – such as cartoons, comic strips, and pictures.¹³ From the present study it will be seen that by the beginning of the twentieth century

supplement at the back, for example, as part of the issue for Saturday July 1, 1876, although at that time the only graphics were the illustrations to the advertisements placed there. Alongside their newspaper publishing Wilson & Horton developed a thriving commercial printing business which provided both revenue and the technical means and expertise required for the production of the annual and other special issues. (See also chapter 7.) R.A. McKay commented in 1940 that it was the illustrative side for which both the “daily and weekly papers have long been noted”, and that “the *Weekly News* and its associated Christmas Number have in this respect a reputation that is World-wide.”¹⁹

In the same city, the *Auckland Star*, at first entitled *The Evening Star*, began in 1870 as a partnership between W.T. Ferrar and G.M. Reed, with capital provided soon after by Henry Brett, who became the owner after the departure first of Ferrar in 1871, and then of Reed in 1876. It was from this firm that was to come the later rival to the *Weekly News* – the *New Zealand Graphic* which appeared in 1890, just after T.W. Leys had become a partner. By the turn of the century, the Brett Publishing Company were the registered publishers of the *Star*, the *Graphic*, the *New Zealand Farmer* and other publications.²⁰ Competition among weeklies helped drive efforts to increase the readership, and was manifest particularly in many of the special supplements that appeared, the Christmas supplements being the most regular. It was for these that the use of colour was one of the noticeable areas of enterprise, although other supplements that featured printed colour from the nineties onwards included those which marked the Exhibition (1898) and the Coronation (1902), as well as issues celebrating the Jubilees of various papers that began to occur from around that time.

The 1880s: The Introduction of Colour to the Christmas Numbers

Since the time of European settlement in New Zealand, merchandise imports had tended to exceed exports, but the 1880s had been marked by an outflow of capital, causing a contraction of imports that in turn stimulated local manufacturing. However, falling freight rates meant greater competition on the world market, and also, after the population increase of the seventies in New Zealand, immigration was slowing causing pressure in the other direction and hence less expansion of the domestic market. This meant that those industries mainly serving domestic needs, the “naturally protected industries”, which included “construction, foods and printing,” experienced a downturn, as “their share of all manufacturing employment fell from 67 percent to 49 percent” between 1881 and 1891.²¹ To allow New Zealand businesses to remain competitive, workers faced a reduction in wages, and these conditions created the will to unionize.²² In this climate, it is not surprising that costly colour printing generally did not flourish in the earlier part of this decade. In fact

in the *Auckland Weekly News*, it was not until the late eighties that colour productions, which were often lift-outs, began to appear as a regular feature.

By then, examples as to how local subject matter could be used as content had been set by such books as *New Zealand Scenery Chromolithographed after Original Water-color Drawings* by John Gully, a famous book which had been published in New Zealand in Dunedin by Henry Wise in 1877, but for which the colour-printing had been executed by the London firm of Marcus and Ward. The custom at the time, especially in matters relating to artistic taste, was to look to Britain for the template, where journals such as *The Graphic* were carrying colour in the eighties. Many of the early lift-out plates that were part of the supplements provided with the Christmas numbers in New Zealand were akin to such overseas productions, those produced with New Zealand content probably looking to such models as *New Zealand Scenery*. The lift-out plates in the weekly were chromolithographs, commonly of about foolscap size, often featuring New Zealand themes, and were often reproductions of original paintings that had been executed especially for the purpose, but unlike *New Zealand Scenery*, they were printed in New Zealand at Wilson & Horton Ltd. The first colour supplement to appear in 1888 was a locally chromolithographed print entitled the *Belle of Kainga*, which was advertised in advance “as marking the great advance in art illustration in Auckland.”²³

Early Graphics Pave the Way for the Later Colour Supplements

Early illustration in the *Weekly News* had been at first for advertising purposes, often via a simple wood engraving (which often was a stereo block), for example, a black and white image of a bottle of Lea & Perrins Worcestershire sauce that appeared on the front page of the February 6th 1869 issue. The use of a relief block reflected the need for ease of printing both text and image in relief in one impression from the same forme, as the embossing on the back of this image testifies was done here. Gradually, over the next two decades, the illustrative content of the *Auckland Weekly News* rose, reflecting both the market desire for the pictorial, and the ability of the printers to introduce graphics that were both affordable and of interest to the mass market, but also that were economic for the publishers.

Examination of surviving issues shows that black and white illustrations were used throughout the seventies for a variety of purposes in addition to advertising, ranging through the depiction of farm animals, places, buildings, portraits, fashions, the re-creation of events and the illustration of stories, reflecting the need of readers for a wide range of information, much of which was deemed suitably conveyed via images. On July 15th 1876, an

advertisement announced new illustrative initiatives for the readership of this by now very popular New Zealand weekly:

We have great pleasure in informing subscribers to the "Weekly News" that arrangements for some time pending for the production of a series of VIEWS of public interest, Public Characters, Prize Cattle, Fashions &c., are now nearly completed. Engravings in the most finished style, by the best artists, will be given, and no pains of expense spared to maintain the LEADING POSITION which the "WEEKLY NEWS" has achieved and held for so many years over all competitors. Although entailing very heavy additional expenses, the subscription for the "WEEKLY NEWS" will NOT be increased. PRICE: FIVE SHILLINGS PER QUARTER. Payable in advance. Forwarded to any settlement in the colony.²⁴

The circulation notice, which appeared frequently, described the *Weekly News* as "the best country newspaper" and although precise circulation was not stated, the indication was of an Australasian readership by the late seventies. The notice stated that it

possesses the largest circulation in the colonies...throughout the Northern districts of Auckland, through the Waikato, Thames, East Coast, Poverty Bay, Hawkes Bay, Taranaki, Wanganui, and other districts in the North Island and likewise has considerable circulation in the South Island and Australian colonies. The proprietors are in a position to guarantee to advertisers a larger bona fide circulation than any other newspaper in New Zealand, the amalgamation of the two newspapers having nearly doubled the circulation of the *Weekly News*.²⁵

This may have been an exaggerated view, judging from the tables of circulation figures provided by Ross Harvey who stated that although the figures that he gave are to be viewed with caution, nevertheless they "allow moderately accurate ranges of circulation figures for each decade... to be deduced."²⁶ The circulation figure given for the *Auckland Weekly News* by 1880 was 6000, while in comparison, for the Dunedin weekly the *Otago Witness*, the figure for the same year had been 7000.²⁷

Frequently the weekly issues carried pictorial supplements at the back, typically containing up to full page illustrations, printed from zinc line blocks which commonly appeared on the front page. Over the next decade, the Christmas supplements featured special pictorial productions in black and white, often consisting of large engravings advertised ahead. Increasingly, these engravings included New Zealand subjects, for example, the three that were featured in the 1878 Christmas supplement: 'Kawau', 'Lake Taupo', and 'Mount Cook'. Descriptions were given to accompany the engravings, although, typical of this time, no mention was made of either the engravers or the origin of the engravings. From about 1880 engravings were incorporated more often also in the body of the paper, rather than being confined to the weekly or Christmas supplements. This was well before the year given by Scholefield, who, in relation to the *Auckland Weekly News* stated that "illustrations were introduced in 1898".²⁸ As well as for entertainment, illustrations were beginning to be provided more frequently to accompany an article, perhaps in the form of a diagram for an agricultural article, or to depict an historical scene of general interest. For instance, a large engraving, 'The Encounter of the Police with Ned Kelly' illustrated a three column story on

the Kelly Gang²⁹, while an article published in 1881 on artificial manuring, 'Experiments in Wheat Growing', was accompanied by four illustrative figures.³⁰

By the nineties, photographic illustration began to appear regularly and copiously, gradually taking over almost exclusively in the black and white printed pictorial province, the camera beginning to oust the artist as originator in this area, and bringing to New Zealanders the ability for a more diversified reflection of the environment in which they lived. For such production, higher quality paper had to be provided to print pictures by means of half-tones. At the beginning of the twentieth century, the *Auckland Weekly News* began to appear with a pink page at the front and one to separate the front section from the now typically entirely photographic 12 page supplement, for which text was used solely to support the printed pictures. It is significant that it is this feature that has been remembered by so many New Zealanders: colour per se is a point of difference, and in this case became associated with that particular weekly. In 1897, the view was that text might even become subordinate to the pictorial in the future, a conjecture that was expressed in the *Weekly News* itself:

Maybe illustration will largely take the place of letterpress, and journalistic skill will show itself in transferring at a glance a whole world of news about an event. We know that illustration has been making extraordinary strides in newspaper enterprise, but hitherto, it has been but to illustrate the text.

The new development may be in the direction of largely superseding the text, as it is known that more vivid and forceful impressions are always conveyed directly to the brain through a glance of the eye, than when they have to go by the round about way of letters and words transformed into thoughts.³¹

The half-tone processes meant that by now events and up-to-date sporting activities could be given coverage by means of process pictures. News photography had arrived, and it too was often enhanced by the use of colour to woo the market.

The Pictorial Supplements and Colour Printing

An inspection of some of the *Weekly News* special supplements and annual numbers was carried out to determine how colour printing was employed in the genre up to 1914. For the years for which the Christmas numbers were not available for examination, or in cases in which the supplements were missing, the advertisements which usually appeared in advance were found to detail the special aspects which were to be included in the coming supplement or Christmas number. Sometimes the advertisement preceding the special Christmas production referred to the 'Pictorial Christmas Supplement to the Auckland Weekly News' and sometimes to 'The Christmas Number of the Auckland Weekly News.' For surviving issues the inspection of detail was by means of x 10 magnification.

In the early eighteen eighties, when the illustration to be offered in the Christmas pictorial supplements did not include colour, large engravings were offered as the special feature. For example, the relevant section of the 1883 advertisement that preceded it read:

The following Splendid Illustrations will also be given:- "Jack in the Box." "The Lost Path." Full page engraving. "The Orphan School at the Pantomime." Full page engraving. "Worn out with Pleasure." Full page engraving.³²

By 1885 engraved reproductions of New Zealand views, printed in black and white, were featured, a list of the forthcoming views being given in the advertisement preceding the issue. Under the heading 'Pictorial Christmas Supplement', part of the advertisement ran:

With the Auckland Weekly News of the 26th of December will be published a special Eight Page Pictorial Supplement containing nineteen well-executed Views of New Zealand scenery, &c. drawn by local artists and engraved at the Herald Office....conveying [a] vivid impression of the diversified features of both town and country.³³

A similar production occurred for the Christmas number of 1886 and in 1887 a variety of art-works were again presented in black and white, the advertisement that preceded the issue noting that the reproductions were to be "printed on fine toned paper." Some of the coming attractions appeared under the heading 'Christmas in the Old Land', and some under the heading 'Christmas in the New Land,' while a note at the end stated "These pictures are...Photo-lithographed in the best style."³⁴ A point of difference was clearly being sought each year to keep the intrigue of novelty.

In 1886 an unexpected event prompted Wilson and Horton to make a foray into tinted colour, not for the *Weekly News* Christmas number, but halfway through the year in June. The event was the eruption of Tarwera causing the destruction of the by then famous pink and white terraces, and just eleven days after that shocking event, presumably in response to the massive reader interest that would have ensued, a one-page supplement appeared with the *New Zealand Herald* of 21st June showing three lithographed images for which the extra step had been taken to add tinted colour to the key chalk-manner lithographs printed in black ink. The middle image, 'Te Tarata. Or White Terrace, Lake Rotomahana' appeared as a two-tone lithograph in blues and greys in the style of the Ward and Reeves Dobson Report images of twenty years before, while the other two, the one at the top of the page, 'Wairoa Township from Te Komiti', and at the bottom, 'Otukapurangi, or Pink Terrace, Lake Rotomahana', were moving beyond tint lithography to chromolithography, as at least three colours appeared in both, as well as the basic black. Although the copy in the Alexander Turnbull Library is faded, for 'Wairoa Township', there was probably some overprinting of blue on buff to create the green of the bluffs. For the depiction of the colour of the Pink Terraces, blue and pink tints had been added, and the colour green may have been produced by overprinting, although the faded state does not make this clearly apparent. However, a faded colour (perhaps pale yellow) can be seen under (and mixed with) blue in the areas depicting foliage.³⁵ In the bottom left-hand corner the imprint read "Wilsons & Horton.

Chromo-Lith. Auckland.” Perhaps this event had supplied the spur for Wilson and Horton to try colour as the new point of difference to be presented to the marketplace with the Christmas number, but this did not happen until 1888.

The Beginning of a New Zealand Tradition

The appearance of the new departure was heralded in the advertisement of 15th December for the 1888 *Auckland Weekly News* Christmas number, in which the first presentation chromo-lithograph to appear as a supplement was publicized. As an added feature, colour in the wrapper was also introduced to catch the eye of the customer and to rouse immediate interest in the latest advance for this journal: colour.

The Christmas Number of the Auckland Weekly News will be issued on Saturday December 22, and will, with a coloured wrapper, consist of sixty pages or three hundred columns, being the largest weekly newspaper issued in the colony. This number will contain, beside the usual features, a large and varied selection of reading appropriate to the season, viz:- Christmas tales, children’s stories, puzzles and games, music, poetry, etc., etc., etc., with a number of humorous woodcuts. The proprietors of the “News” will have much pleasure in presenting to the subscribers a beautiful chromo-lithograph printed in 10 colours, on fine enamel paper, being a *facsimile* of an original water-colour drawing (produced by Mr. Charles Palmer, of the Herald staff, expressly for this number), entitled the *Belle of Kainga*, as marking the great advance in art illustration in Auckland, it might be mentioned that the value of the edition of the picture which will now be given away amounts to upwards of £200.³⁶

That such a chromolithograph was intended to be hung on the wall in the manner of an artwork was made explicit in the Christmas number itself, where the choice of subject for the ‘Belle of Kainga’ was also explained. The name of the chromolithographer was not given.

With reference to the print, it was stated:

It will, we are sure, be considered worthy of a place on the walls of every house into which it may come, for its own merits as a work of art, and also preserving a memorial of Maori life, and of a state of things which may be said to have passed away within the last few years. The picture is a faithful reproduction ... and will be found accurate in every respect as a representation. Ten colours are used in the printing of the picture, which we believe is the most elaborate piece of chromo-lithography which has ever been attempted in these colonies.³⁷

The 1889 advertisement reported that the response to the previous year’s production had been such that the proprietors were encouraged to “still more liberal efforts”, the gift supplement they produced this time being worth £1000. It contained the chromo-lithograph ‘The Advent of the Maori Christmas A.D. 1000’, which was “to be printed in 14 colours, on enamel paper, in facsimile of the original watercolour drawing which they have commissioned those two eminent artists, messrs. Steele and Watkins, jointly to produce, expressly for this number.”³⁸ The print depicted the ‘Tainui’, the first Maori canoe to arrive on New Zealand shores, passing under a pohutakawa at daybreak. The Maori theme was a common one, for example, it was used for the chromo-lithographs presented in the Christmas numbers of 1890 and 1894, in the 4-page colour supplements of 1895 and 1896, and also for a large lithograph produced in 1892.

The 1890 chromolithograph provided in the Christmas supplement, for which there was an accompanying text, was entitled 'Arrival of Captain Cook; An Incident at the Bay of Islands'. (Plate 42.) From examination it can be said to be a typical production, boldly albeit rather crudely coloured, and 34 x 23 cm. in size. From a work in which the landscape was by Kennett Watkins and the figures by L.J. Steel, the print was chromolithographed in ten colours, and must have necessitated overprinting using almost as many lithographic stones. (The whites may result from the paper colour showing through.) Under x 10 magnification it could be seen that the colours used to create the entire chromolithographic composition were yellow, two blues, grey, two browns, pale orange, pink, black and white. Thus for instance the sky effects were built from yellow, two blues, pink, grey and black, giving a colour gradation from light to dark. (Compared to the colour in the 1890 chromolithograph, in the reproduction copy, plate 42, yellows are somewhat deficient, in that the brightness appears toned down, and the sea-green in the sky is quite muddy.) The text stated that Cook "is explaining to the Maori chief the different uses of the bullets and small shot he holds in his hand; that the one is intended to kill men, and that the other is for birds."³⁹ In the bottom right hand corner of the partial copy in the *Auckland Weekly News* held at the Auckland Public Library the imprint appears as "Wilson & Horton Chromo-Lith. Auckland." It can be seen that this is missing from the illustration: this detail must have been trimmed off from the Turnbull Library's copy from which this laser-printed copy was prepared.

The 1894 picture, 'Poi', "a double-paged presentation plate," was of a scene in a pa with three Maori women "whiling away the sunset hour at poi, the Maori maiden's musical pastime."⁴⁰ The chromolithograph on the first page of the four page supplement that appeared in 1895 was entitled 'For His Enemy'. It depicted an episode from the Maori Wars when Colonel Booth was shot while leading the assault on the Gate Pa, Tauranga. A Maori was depicted bringing water to Booth, after risking his life to obtain it by threading his way through English sentries outside in the darkness. These prints were all chromolithographed in a similar way at the Wilson and Horton printing works in Auckland.

The four-page supplements for both 1895 and 1896 were entirely colour printed, also at Wilson & Horton. The chromolithograph featured on the front for 1896, 'A Noble Deed', was of an incident in 1846 when fifty men from H.M. 58th, under Lieutenant Page were stationed at Boulcott's farm in the Hutt Valley. Pages 2-3 of both these supplements were devoted to colour political cartoons, and as well, each featured a colour cartoon story on the back page. The taste for personal caricature as a graphic means of political and social comment, well established in the British press, was an inherited feature now also being used

as the basis for introduction of the extra element of colour. The eight political characters caricatured in each of these supplements occupied a double page spread, four to a page, each with captions that would characterise them appropriately to the readership, for example, 'King Richard' for the Hon. R.J. Seddon, Premier. This time the artist, Vyvyan Hunt, who carried out much illustrative work for the *Auckland Weekly News* is acknowledged in the bottom right-hand corner of page 3, but the chromolithographic artist remains anonymous. In keeping with the graphic practice of the times, prepared mechanical tints have been used. (Plate 43.) The 1895 cartoon story in nine frames on the back page entitled 'Called Back' consisted of humorous colour pictures with text in black and white to reflect historical events or items clearly associated with New Zealand. These were intended to highlight changes that Captain Cook would have seen if he had been able to revisit, while the local readership would be expected to identify with the accompanying comments. One frame, showing Cook marvelling at the *Weekly News*, took the opportunity to slip in an advertisement.

By now the ability in New Zealand to carry out half-tone process work meant that photographs also became a feature of the special supplements, and 1895 was likely to have been the year in which these made their debut in the *Auckland Weekly News*. The Christmas number included eight pages of photo-engravings. Although I was not able to view the Christmas Annual for the previous year (1894), the advertisement for that year did not mention photo-engravings (an early term for relief half-tones)⁴¹ but in the 1895 advertisement prominent reference was given.

In addition to the Coloured Supplement, the Christmas Number of the *Auckland Weekly News* will contain Eight pages of Photo-engravings comprising 'Scenes of the Goldfields', 'Views of New Zealand Scenery', 'New Zealand Children', 'Views around Auckland', Etc...⁴²

For this 47 x 33 cm. journal the price was still 6d within New Zealand; 7d to Australia and the South Pacific Islands, and 9¹/₂d to all other parts of the world. However, although the price had been held at least to 1895 to 6d. a copy, by 1898 the price had doubled to 1s.,

Plate 42: 'Arrival of Captain Cook; An Incident at the Bay of Islands.'
 [Figures by L.J. Steel and landscape by Kennett Watkins.] Chromolithograph 342 x 233mm.
 With the *Auckland Weekly News* Christmas number supplement, December 1890.
 By permission of the Alexander Turnbull Library, Drawings and Prints.
 Ref. No.: B-077-003.

Plate 43: 'Parliamentary Character Sketches.'
 Artist: Vyvyan Hunt. Coloured lithograph (mechanical) 441 x 569mm.
 In the *Auckland Weekly News* Christmas number supplement, December 1895.
 By permission of the Alexander Turnbull Library, Wellington, N.Z., Newspaper Collection.
 Ref. No.: N-P 593-SUPPL

PARLIAMENTARY CHARACTER SKETCHES

"KING RICHARD"
MR. H. J. LUBBOCK, PREMIER

"THE ONLY LIBERAL"
MR. ROBERT SCOTT, R.F.M.G., OPPOSITION

"CHEAP MONEY"
MR. H. W. WOOD, TREASURER

"LEADER OF THE OPPOSITION"
MR. ROBERT SCOTT, R.F.M.G.

presumably to help cover the costs of the increasing use of colour printing and now half-tone image production.

After the mid-nineties, the *Auckland Weekly News* used the gamut of illustrative techniques within their capabilities to woo the readership. The photographic content rose, but did not supersede visually reproduced chromolithographic colour which indeed co-existed with other forms of illustration to the end of the period under study. By 1897, the two presentation chromolithographs, the first, 'Luck at Last', showing a returning gold prospector pointing the way to the discovery site to his mates; and the second, a reproduction of a water-colour scene in the Isle of Skye, were part of a presentation in which many modes of illustration were being used to attract the customer. Nostalgia continued as a telling ingredient. But that the readership was buying a product that was now largely directed towards the photographic portrayal of the New Zealand environment is evident from the advertisement concerning the issue:

The body of the number itself is a series of singularly truthful sketches of life in New Zealand, presenting in photogravure the various phases in the life of the pioneer settler, the gumdigger, the bush farmer, the gold seeker, the sheep farmer, etc. with glimpses of woodland scenery, bushmen's homes, river fords and ferries; with a great variety of all the situations, conditions, operations, and vicissitudes in a gold miner's experiences. Timber-getting, flax-milling, creameries, whaling, are all delineated in plates that have all the accuracy and finish of steel engravings, while a letterpress description meanders among the whole of the pictures. There are several large historical pictures, of great interest, as the signing of the Treaty of Waitangi by the Auckland natives on the Tamaki, the capture of the brigatine Hannah at Mercury Island. There is a full page and very striking view of "On the Lawn" at Ellerslie, and another of Auckland from the *Herald* building. There are a number of miscellaneous sketches of great beauty, among them a very pretty picture of Lady Ranfurly.⁴³

However, from the examination of the run of these special supplements, it could be seen that colour began to be introduced in a new way in the early twentieth century when half-tone photographs occasionally began to appear in colour. To achieve this, prepared tints were sometimes added to a black and white half-tone image. This was not a new technique, such ready-made colour was often added to cartoons and other drawn images in this way, for instance the parliamentary figures in the 1895 and 1896 colour supplements. Logically it was the next step, but before three and then four colour printing became a standard technique, colour was added to the page using a variety of processes. For instance, the 'look' of halftone photographs was used in the production of some graphics that in fact had been produced by a lithographic artist.

It can be seen that the quest was to satisfy an ever-increasing pictorial interest. Since colour had now become a prime market driver in the pictorial annual and special supplements, it made good business sense to find a way to print 'process' illustrations, material that had now become such a prominent feature in the 'weeklies' genre, but still sometimes

incorporating colour that could be provided by employing existing skills and plant without the expense of tri-chromatic printing, even after the latter had become a possibility. Not only was the subject-matter for images burgeoning, but each new method for executing an image was being seen as a way to introduce extra novelty to the market in the endeavour to increase the vital circulation figures. Rather than one style entirely superseding another, for an annual production such as the *Auckland Weekly News* Christmas number, 'process' became a way to increase novelty, with colour playing a prominent part in the presentation of photographic images in the special supplements, and the greater lead-in time available before publication than for the regular weekly issues facilitated this enterprise. As discussed in chapter 7, by 1897 the plant at Wilson & Horton Ltd. was equal to the task, having by this time the technical capability for a range of printing processes.

Into the 20th Century

From April 1898, all pictorial supplements to the *Weekly News*, including those that were issued at about monthly intervals, contained much photographic material, mainly printed as black and white half-tones on glossy paper to facilitate the quality of the images. Colour as a regular feature continued in the special supplements, and for the readership must have been the icing on the cake. As well as the lift-out chromolithographs and the colour supplements, chromolithographed colour was also regularly being used on the covers of most special numbers which were now of a heavier nature, being more a thin card than paper. An advertisement that appeared for the 1898 Exhibition number informed the potential market that it had taken several months to prepare, and said "it will contain hundreds of beautiful illustrations...and will be published with a handsome cover. The whole number will be printed on paper of extra quality, and with superior ink..."⁴⁴ When it appeared, the 1898 Exhibition number cover was handsomely chromo-lithographed in several colours: solid tones of red and gold, and tones of dark blue in a spatter style. This production sold for 1/-.

Also mentioned in the advertisement was the fact that most advertising space had already been contracted out. By this time many advertisements were themselves being printed in colour, typically on the back cover and its verso, and on the verso of the front cover: they would undoubtedly bring in extra revenue. The advertisements were usually printed in some of the colours that had been used for the front cover chromolithography. For instance, the 1898 Christmas number featured a front cover of red and blue-grey for the display lettering placed over a harbour scene, using both solids and a spatter style, with fancy blue and red borders; the verso advertisements were also in red and blue-grey.

The general push was to provide the market with the latest in pictorial material, presented in the latest style. By the early years of the twentieth century this meant that effort was directed towards the provision of colour in the form of halftones: the process that by then had been pioneered for New Zealand in Christchurch. It is interesting that prior to the publication of actual colour half-tones, as the effort was made to present the visual appearance of a half-tone, the chromolithographic style sometimes began to change. For instance, for the cover of the 1901 Christmas number the chromolithographed image was printed in a stipple technique to give it a resemblance to a coarse half-tone. The imprint at the bottom of the back cover was stated as "Wilson & Horton, Artistic Letterpress and Lithographic Printers." The firm had reported in 1898 that its capability for half-tone printing had been enhanced by the acquisition of "one of the newest and most recently imported printing machines, the only one of its kind in the colony, for producing fine art and half-tone work of the highest grade."⁴⁵

Colour Half-tones

In the next year, with the separately paged Coronation Supplement, published with the *Weekly News* issued for Thursday, June 19th 1902, came a genuine tri-chromatic half-tone printed on a heavy glossy paper, an image of the new King, 'His Majesty King Edward VII', prepared from a full length portrait study by the artist Samuel Begg. (Plate 44.) When examined under x 10 magnification, the characteristic halftone dot pattern in red, blue and yellow can readily be seen, with some overprinting in black for extra shading. The lift-out picture was about 25.5 x 18 cm., having a dark purplish background against which the figure of the king stood resplendent in royal tones of red, gold, royal blue and white. The twenty page supplement carried numerous other photographic illustrations, many with added decorative elements, all printed in black and white: it was the image of the King that was being offered as a print to be framed.

After this, process colour appeared more often, for covers as well as supplements, such as that for 1904. This cover featured a three-colour print of a head and shoulders study of a girl and flowers, within a gold circular frame on a cover otherwise lithographed in greens and white with gold-blocked lettering. The use of gold was a common feature in this decade. However, covers still were often entirely chromolithographic, an appearance that by now had grown familiar to the market, and was the style used for the 1905 issue. As time went on and experience of new processes was gained, standards improved, and by 1908, the cover of the *Auckland Weekly News* had an almost modern look. As mentioned, the colour half-tone, a picture of a Maori woman, had been competently produced using black

integrally in addition to the three basic 'process' colours. (See plate 15, chapter 7, opp. 256.)

The Christmas number for 1906 exemplifies the combination of illustrative techniques which were by then being used to present graphics in an attractive manner, and to bring interest and variety to the market. On the front cover, against a dark-green lithographed background with a decorative border in two greens, a tri-chromatic half-tone portrait of a girl was printed framed within a solid gold circle. Below was a trichromatic half-tone scene (not as fine-grained as the portrait) within a rectangle. The decorative display typography was also lithographed in colours. "Wilson & Horton Litho, Auckland" was printed at the bottom right-hand corner. Special colour effects were given to essentially black and white half-tone photographs inside the issue by using a tinted background in a creamy yellow, to give a warm tone to portraits or scenes. This device became a commonly used way of adding colours to special issues: with, for instance, blues, greens, pinks and creams sometimes being used in turn, or one colour being featured in a particular supplement. At the time, when process colour was relatively new, this compromise had the market advantage of giving the realistic appearance of 'colour photographs' that was considered 'modern', but produced by using existing lithographic plant. An interesting example was the colour lift-out provided with the 1912 Christmas number. Presented on coated paper, and entitled 'Christmas in the Far North of New Zealand', it was a full-page chromolithograph, but with a half-tone photographic impression printed over the top in black to give the 'colour photograph' look. The photograph was by A. Northwood.

Other New Zealand Weeklies

Auckland: The New Zealand Graphic

The appearance of the first number of the *New Zealand Graphic* was noted in *Typo* in June 1890,⁴⁶ although R.A. McKay mentions 1891 as the year in which this illustrated journal appeared.⁴⁷ Guy Scholefield confirms the 1990 commencement date. R.C. Harding referred to it as "an attractive weekly" issued by H. Brett, the Auckland publisher, and commented that most of the illustrations, as was usual, were from imported blocks. From the copies in the Alexander Turnbull Library of special numbers produced in conjunction with this weekly, it can be seen that, pictorially they were comparable productions to those of the

Plate 44: 'His Majesty King Edward VII.'

Tri-chromatic process print overprinted with extra black, from a full length portrait study by Samuel Begg.

Published as a removeable print in the *Auckland Weekly News* Coronation supplement, 19 June 1902.

By permission of the Alexander Turnbull Library, Wellington, N.Z., Newspaper Collection.

Ref. No.: N-P 592-SUPPL

Auckland Weekly News, and hence in competition. The modes of illustration were similar, indicating a successful formula, although the *Graphic* was a slightly smaller size, and, conceived in the magazine style, concentrated on the visual side of reportage.

Pictorial illustration regarded as an intentional marketing tool was also used to drive the *New Zealand Graphic* which, in the *Cyclopedia of New Zealand*, was called the first illustrated paper. This was so in the sense that it was the first journal established expressly for the purpose,⁴⁸ but it can be seen that in Auckland it was through predecessors such as the *Weekly News* that the presence of such a market was first demonstrated and developed, and the ability for colour printing was part of the pictorial market driver that had by this time been established by that journal. The *Graphic* relied almost entirely on its pictorial content rather than being a potted news, but the special numbers were similar in style to other such productions coming from many New Zealand newspaper firms. From surviving special numbers of the *New Zealand Graphic* it is evident that the Star Litho Works, where they were produced, was well able to cope with the challenge of the illustrative precedents that Wilson and Horton had by now set.

It is notable that the issues of the *New Zealand Graphic* Christmas numbers that were examined from 1893 onwards were all printed on coated paper, and all contained process illustrations throughout. These had been made from both drawings and photographs, consonant with the fact that Henry Brett had introduced the first photo-engraving plant into the country. For instance, on the first page of the issue for 1893, which has "NZ Graphic Photo-engraving" printed at the bottom, an L-shaped illustration to a story, drawn by the artist "K.W." (K. Watkins), can be seen to be a half-tone. The fact that photographs, too, were sometimes being acknowledged shows that these were being obtained from photographers in other towns. For instance, 'In the Home of the Kiwi' which appeared on page 5 of the 1894 Christmas number, was from "Martin, Photo., Wanganui."

Colour in the New Zealand Graphic

However, it was not only the process illustration, but the colour printed picture presentation that also paralleled Christmas number productions from Wilson & Horton. Indeed, in some years during the time when special colour productions were regular presentations, by printing four full-page chromolithographs in the body of the number, as well as a supplemental plate, the *New Zealand Graphic* was outdoing the *Weekly News* in colour content. In 1893 the supplement consisted of a very large, brightly coloured reproduction of an oil painting occupying a folded double-page, entitled 'The Champagne Pool and Tuhuatahi Terrace Wairakei Hot Lakes'. The caption at the bottom stated that the original

was by artist T. Ryan and that it had been chromolithographed at the Star Litho Works in 1891. New Zealand scenery was the general subject for all five of the 1893 colour printed pictures. Opposite page 4 appeared 'Lake Rotorua and Mokoia Island, Auckland New Zealand', from a painting by T. Ryan, by way of illustration for the story 'The Way of Our Grandfathers'. Opposite page 10, by the same artist, was 'Lake Taupo and Waikato River, with Tongariro and Ruapehu', which also features Maoris paddling a canoe in the foreground; opposite page 15 was 'Head of Lake Te Anau, Southland, New Zealand', this time from a painting by L.W. Wilson; while 'The Waikato River, Auckland, New Zealand' by T. Ryan appeared opposite page 21. The chromolithographer was not acknowledged for any of these reproductions.

The 1894 Christmas number was similar: the readership was presented with four full pages, this time mainly of New Zealand cities which were chromolithographed at the Star Litho Works in a stipple-style using similar colourings as for the previous year, but from paintings by K. Watkins. The exception was the view that was printed facing page 10 entitled 'Wellington, New Zealand, From Thorndon', which was stated to be "from a photograph." The others views were: 'Takapuna Beach, a Favourite Summer Resort; Auckland Harbour, Midsummer' (both on one page facing page 6); 'River Avon, Christchurch, New Zealand', opposite page 15; and 'Albert Park, Auckland New Zealand' facing page 19. Two years later in 1896, the practice, made popular by the *Weekly News*, of providing the chromolithographs as liftouts was adopted. There were two: one with a Maori theme: 'Te Heuheu's Old Pah of Wai Tahanui at Taupo Lake', while the other was a folded double-page reproduction of Robert Hawcridge's painting, 'Milford Sound, New Zealand'. The latter, memorable for the real light in it, is a sunset scene in golds and oranges with contrasting darker blues shading into inky blue shadows.

In the years 1897 and 1898, a new treat was in store for the readership in the form of two huge chromolithographed maps that were prepared as give-aways with the Christmas numbers, the first of the North Island of New Zealand, and the second of the South Island, at a scale of 16 miles to the inch. Folded in four, they were entitled 'Pictorial Map of the North Island of New Zealand', and 'Pictorial Map of the Middle Island of New Zealand', respectively. "Compiled from the latest Government Maps and Statistical Records" was printed at the bottom, as well as "Lithographed at the NZ Graphic and Star Printing Works, Auckland". In the style of the times, both maps incorporated several geological sections, also colour-printed, for example, 'Canterbury from Banks Peninsula to Mt. Cook', and showed latitude and longitude.

However, these maps were adapted for the popular market by printing vignettes around and on each map to show views of many of the cities in a variety of shapes and sizes. Districts were shown via solid colours, and printed informational statistics relating to the geographical localities appeared on the maps, such as population, areas of districts, products, and in addition, relief, which was shown in a pictorial manner. In the bottom right hand corner appeared an inset map of the whole country showing provinces. These 'presentation' maps were attractive as well as innovative, and are indicative of the capabilities of not only New Zealand chromolithographers at the end of the nineteenth century, but also of the perceptions of the publishers as they adapted their productions to what they gauged to be not only desirable to their markets and abreast of the times pictorially, but also suitably striking in presentation, in the quest to attract an even wider circulation and with it greater advertising scope, and hence revenue. The *New Zealand Graphic* special numbers bear the imprint "Printed and Published by the Brett Printing and Publishing Company, Ltd., Shortland and Fort Streets, Auckland, NZ" (or similar, such as "Lithographed and Printed by...") on the back covers.

Into the twentieth century, the Christmas numbers from 1901 to 1907 all continued to ring the changes with pictorial content, with colour printed covers, and a variety of black and white illustrations, mixed with the introduction of colour often in the form of tinted half-tones. There was a noticeable tendency to try simplifying the colour, no doubt as interest in tri-chromamatic printing methods was increasing and experiments were being made also to cut costs. This gave rise to other ways of employing colour economically and effectively, such as for the cover for the Special Royal number published on June 22, 1901 to commemorate the visit of the Duke and Duchess of York. The lithography was in red and blue on a pale blue background, using large areas of flat colour and decorative typography to give appropriate impact.

By 1906 the front cover of the Christmas number carried an inset, depicting a Maori woman that had been printed in colour half-tone, using black in addition to the three basic colours in keeping with the trend towards four colour printing. The rest of the cover had been lithographed using textured backgrounds. In previous years, the emphasis on the three primary colours, red, blue and yellow was evidenced in other ways, such as their use for the colour advertisements lithographed on the back cover of the 1904 issue. Now that photographic images had become so popular, as well as by three and four colour printing, other ways of giving the appearance of colour process printing were introduced. The 1907 Christmas number exemplifies this. While the attractive cover had been lithographed in

colour, the lift-out supplement, entitled 'Summer Scenes on the Wanganui. the Rhine of New Zealand', was given the appearance of a colour photo by overprinting black and white process 'photos' in tints of blue, yellow and light red, in some places giving shades of green where yellow was overprinted with blue. By now, much of the pictorial content, both black and white and colour, was aimed at the overseas audience as well as the local readership, with the wealth of images appearing to show off the country in all its facets, and such images helped to make the unique New Zealand environment, including its scenery, famous.

The pictorial content of these weeklies included a large scenic New Zealand portion, in keeping with the rise of tourism. The spectacular natural environment was now being seen as a national asset in this regard. Many promotional advertisements for the New Zealand scenery appeared, for instance, page 24 of the Christmas number of 1901 was a whole-page advertisement for the New Zealand Government Railways, placed to highlight tourist excursion tickets to the North Island thermal springs, the Southern Alps, the cold lakes of Otago, and the glacial district. Publicity for the New Zealand environment was being used in another way: it was designed not only to encourage travellers to visit the Colony, but also to entice the prospective settler, especially the settler of means. Besides, an increase in population also increased business opportunities, including those for the service industries such as printing. The advertisement in the Christmas number of 1903 demonstrates the promotional thrust of the times:

New Zealand : The World's Wonderland! A Happier Britain! New Zealand, a land of sunshine and perpetual green is one of the finest countries in the world for settlement – an ideal home for the man of capital and leisure...⁴⁹

Images such as 'Summer Scenes...' (above), were being used as pictorial evidence of this statement.

Over the last years of the period under study, until the *Christmas Graphic* was incorporated into *Bretts New Zealand Christmas Annual* in 1913, this magazine style journal retained its established format, with colour half-tones and chromolithography often being used side-by-side, although the *Graphic* tended towards more colour process printing, thus presenting a rather more modern look that was consonant with Henry Brett's reputation for keeping up with the latest technical developments. The back covers of these annuals often carried advertisements produced by four colour process printing, as was the case for the 1911 issue. Colour process images were again to the fore in the 1912 *New Zealand Weekly Graphic Christmas Number*, with the front and back covers and four full-page views all printed as four colour halftones. The views, all except one by acknowledged photographers, were of New Zealand scenery and all were marked "Graphic Print". Chosen from both North and

South Islands, they were captioned: 'The Remarkables From Lake Wakatipu'; 'Mitre Peak, Milford Sound'; 'Evening, Hongi's Track, Rotorua'; and 'Tangiteroria, Northern Wairoa, Auckland'. Continuing to reflect the picturesque to both the local and overseas readership, visually this was a modern look, and was in that way a forerunner to the modern magazine.

Wellington: The Free Lance, New Zealand Mail & Evening Post

Free Lance

The *Free Lance* had not been established in Wellington until July 1900. It was not the first or the only Wellington weekly, but saw itself as filling a special market niche. It was reported in the first issue that Wellington was "the only city of any size in the colonies that [did] not possess an illustrated society and family paper of its own."⁵⁰ It has been said that this magazine became the main competitor to the *Weekly News*, into which it was absorbed in 1960.⁵¹ The Christmas numbers of this journal up to 1914 were of a different ilk, however, concentrating on the light entertainment market with content resting heavily on the cartoon. Judging from the copies of the Christmas numbers viewed, the production did not vary greatly to the end of the period under study. The use of colour printing was individual, being employed mainly in simply-designed cover production, and splashy caricature depiction of public figures. Otherwise, content in this smaller-sized journal (28 x 43 cm. and around 32 pages), at this stage consisted of mainly short stories. At half the price (6d.) of many of the other Christmas numbers from the main centres, it was apparently aimed more at the lower end of the popular market, and the standard of colour printing reflected this.

The cover design for 1903 by the cartoonist J.C. Blomfield was typical, mixing together various images of what were by now becoming iconic depictions of New Zealand. On green thin card, the design was rather crudely printed with a red border inside which was a Maori war canoe as centrepiece and in the bottom left-hand corner a kiwi juxtaposed with Maori carvings, all printed in black, beside flat red pohutakawa blossoms. The title, price and year were in gold, the whole cover being lithographed. As stated on the back cover, the production was "printed and published by William John Geddis, at his registered printing offices, Panama Street, Wellington, on December 19, 1903." None of the inside was in colour, although the pictorial content did include some half-tone photographic reproductions, many of which had Maori subjects bearing a crest, a date a number and the words "New Zealand Government Tourist Bureau Protected." The advertising content was quite high, and included many many advertisements occupying full pages, of which one was for New Zealand Government Tourist Resorts.

It was for the caricatures of public figures that bold simple colour printing began to be employed in the Christmas number of 1904, in a series that continued at least through the issue for 1905. Four whole-page productions appeared in each year, and included four well-known identities successively in each sphere: 'Wellington City Corporation', 'The Senate and the Court', the 'Daily Press', 'The Pulpit', 'Softgoods' (the drapers), 'Our Men of Iron', and 'Ready for Risks'. The art work was at this time by J.C. Blomfield, and under x 10 magnification was seen to have been executed in pen and ink lithography,⁵² printed in three colours - black outlines, a flesh-colour to pick out faces and hands of the figures (each labelled), with an underlying coat-of-arms in bright red and white, the latter being the unprinted paper. Register was at best very approximate, as is usual for this kind of cheap publication.

Although its longevity speaks of popular success, this journal was not universally well received, as can be seen from an unappreciative letter published in the *Manawatu Times* on 12th December, 1905, a week after the publication of that year's Christmas number.

We have received a copy of the Christmas number of the Wellington illustrated misnomer, the Free Lance. This publication ought to change its name in the New Year to the Free Crawl. Artistically it hasn't got much beyond the 'this is a cow' stage. Its pictures are profusely labelled, and the public thus have their imaginations quickened to ascertain the Brown or the Jones that this or that is meant for. The cartoons mostly beslaver Seddon and the "pars" beslaver everybody. The one outstanding feature is a monopoly of Government advertisements which its status does not warrant, and which its adulation of Seddon only faintly justifies. We expect from a Free Lance occasional wit, bite, piquancy. This production has none of these virtues. It is the apotheosis of mediocrity.

New Zealand Mail

The *New Zealand Mail* Christmas numbers were associated with the Wellington weekly of the same name, which was clearly intended to be thought of as a New Zealand, rather than merely a local Wellington production. Established in 1871⁵³ by T.W. McKenzie, it was acquired by Julius Vogel in 1873, and passed through several ownerships before, in 1907, being absorbed into the *New Zealand Graphic* which was then known as the *Weekly Graphic and New Zealand Mail*. In the column 'Ourselves' that appeared in the Christmas and Exhibition number of 1896, this aim was explained as emanating from what was by then perceived as being intrinsically its "New Zealand" character.

In presenting the Christmas and Exhibition Number of the New Zealand Mail, we do not wish to trouble our readers with very much in the way of editorial comment. We wish, however, to draw attention to the fact that the whole of the prize stories in this number are written by New Zealanders, that all the illustrations deal with New Zealand subjects, that all the pictures have been engraved in the Colony, that this is, in fact, *A New Zealand Production* from beginning to end.⁵⁴

Its value for money was emphasized. It was claimed, at 80 pages, to be the "biggest and best sixpennyworth of recreative reading ever offered to the public by any newspaper proprietary in the country", being, without the advertisements, "over 250 columns of

reading matter which is equal to the contents of nearly *three* ordinary sized novels, "all this...for the popular sixpence!" Thanks were expressed to the staff for their effort "to break the record so far as Christmas numbers in this colony are concerned." At the end of an 1896 article entitled 'New Zealand,' the worth of the *New Zealand Mail* Christmas number as a suitable ambassadorial item was spelt out as a role that was definitely intended, rather than one that was acquired accidentally. This annual sought to perpetuate the Arcadian Myth with words and pictures alike, and was posed as being suitable for informational use by prospective immigrants as an adjunct to the Official Year-Book:

New Zealand has much to commend it as an almost ideal home for the Briton who is seeking "fresh woods and pastures new", and who wishes to found a new home across the seas, away from the bustle and worry of the Old World. A settled government, the finest scenery in the world, the possession of every possible social, religious and educational institution dear to the heart of the Briton, all combine to make New Zealand's claim of being one of the best possible fields for British emigrants, with a moderate amount of capital, perfectly unassailable. In the account we have given of various attractions for tourists, and the information we have compiled as to our social and other institutions, much has necessarily been excluded through lack of space. We trust, however, that the Home reader will be able by means of what we have written, to gain some fair idea of the colony, the mining and other industries that will be found in the Official Year Book...⁵⁵

From the copies that were examined from 1896 to 1907, it could be seen that they were typical Christmas numbers produced for the general readership: 47 x 33 cm. in size, with chromolithographed covers and copious photographic content. Although ordinary newsprint was used at the front of the 1896 issue, pages 19 to 62 constituted a pictorial supplement printed on coated paper. The photographic reproduction thus began earlier than that stated in *Fields of Golden Daffodils* in which the *New Zealand Mail* was described as "a Wellington news magazine which began reproducing photographs in 1899 using a special insert section of quality paper."⁵⁶ Some of the copies examined were incomplete, but one lift-out supplement was still in place, in the 1903 copy. Probably not an isolated presentation, this one was a large (around demy) tinted lithograph entitled 'You Mus'nt Pull', by Arthur Jelsley (1901), depicting a girl with kittens climbing on her lap; again clearly designed to appeal to the popular picture market. A two-colour lithographed pre-publication poster for this Christmas number had highlighted the coming print to heighten anticipation.⁵⁷

These Christmas numbers represented a decade of graphic production being undertaken in Wellington, with more than one printer involved over that time. For the combination Christmas and Exhibition number of 1896, the lithographic printers, were "McKee and Gamble, Art Lithographers, Wellington, NZ", as stated on the front cover. This issue had been chromolithographed on heavy shiny paper in a simple scheme of four colours: buff-yellow, olive green, and dark and light teal green, for a design containing New Zealand

images of flowers, birds and a log-chopping scene. The appearance, however, was of rather thin, flat colour, compared with, for instance, the later bird cover of 1905, on which appeared “‘NZ Times” Lith. Wellington. N.Z.” Here the twelve colours used for an altogether more competent chromolithograph were rich, deep and artistically applied, giving attractive presentation to the design “New Zealand Native Birds” depicting the tui, fantail, and parrakeet. (Plate 45.) On page 1 was printed the following promotion in proud celebration of the rising standards to which the colour printed cover, created for the eyes of the general readership, was intended to bear witness.

The proprietors of the “New Zealand Mail” take pleasure in again presenting to their many patrons a Christmas number truly and adequately representative of New Zealand. The phenomenal success of the Christmas Number of the “New Zealand Mail” for 1904 has encouraged the Proprietors to spend even a larger sum in the production of this year’s issue, and it will be admitted that their efforts have resulted in a publication that will give pleasure to all patrons, and contribute a charming souvenir of New Zealand to send to friends abroad. This number is enclosed in a beautiful cover typical of New Zealand, and the photographs and letterpress are executed in the best style of the engraver’s and printer’s art. The proprietors of the New Zealand Mail have no hesitation in offering to a critical yet appreciative public their Christmas Number for 1905.

Clearly the investment in quality colour printing was expected to bring returns: perhaps odious comparisons had been made with cover productions from other main centres, and Wellington could now be seen to have pulled up its socks! The back cover of this issue carried advertisements, and was also printed in colour, as was by this time usual for the Christmas numbers of the *New Zealand Mail*, a particularly striking example being the back cover for 1900 which was printed in the bold colours of yellow, royal blue, and red for an ‘Empire Teas’ advertisement, to suggest the fashionable three-colour printing. (Plate 46.)

Covers were missing from some of the early years in this run, but from the cover for 1899 it could be seen that the price of the *New Zealand Mail* Christmas number had doubled from the sixpence that had still been charged in 1897 to 1/- a copy, and that by now it was “printed and published by James Hunter, of Aurora Terrace, for the Wellington Times Company Ltd., at their Registered Office, Lambton Quay, Wellington.”⁵⁸ The relatively mediocre chromolithography for the covers of that year had continued, and later there was no sign of true trichromatic printing or of decorative colour work for the half-tone photographs themselves, although these were sometimes in cover productions in black and

Plate 45: ‘New Zealand Native Birds.’

Chromolithographed front cover to the *New Zealand Mail* Christmas number, 1905.

By permission of the Alexander Turnbull Library, Wellington, N.Z., Newspaper Collection.

Ref. No.: N-P 584.

Plate 46: Advertisement: ‘Drink Empire Teas.’

Published as the back cover to the *New Zealand Mail* Christmas number, 1900.

By permission of the Alexander Turnbull Library, Wellington, N.Z., Newspaper Collection.

Ref. No.: N-P 583 -BACK-

New Zealand Mail

PRICE
1/-

CHRISTMAS 1925
WELLINGTON NEW ZEALAND.

TUI

NEW ZEALAND NATIVE BIRDS
FANTAIL

PARRAKEET

white as in the one for 1900, and the three colour theme was used simply and boldly for advertisements such as that on the back cover for the same year.

In 1903, the size of the journal was altered briefly to 43 x 28 cm., perhaps to save money, but a year later again was published in the larger format that was comparable with other Christmas numbers from the metropolitan weeklies such as the *Auckland Weekly News*. By now paper was cheaper,⁵⁹ so that perhaps the restriction of the smaller format did not provide sufficient gains to offset the disadvantage of less space in which to arrange an attractive pictorial layout. The photographic section was now artistically set out, for example, in collage fashion printed over a background spray of flowers lithographed in pale yellow.⁶⁰ Throughout the number various colours such as pale orange, green or violet were printed to give borders and other stylised visual effects. At the bottom of the front cover, which was chromolithographed in nine or ten colours in the manner of half-tone for a design that included pohutakawa blossom and a Maori girl in a gold-rimmed circular frame: "designed and lithographed by the N.Z. Times Co., Ltd."

The Evening Post

The Wellington paper, the *Evening Post*, did not publish a weekly but did run a Christmas number, of which several issues from the year 1903 onwards have been sighted. These annuals were being marketed in parallel with other Christmas numbers from Wellington in the same period of the early twentieth century. Compared with those from the other major centres, these were more modest productions, but priced the same at one shilling. Apart from the cover, which was of heavy glazed paper on which a decorative border, half-tone picture and display-style typography was printed in brown, the Annual was entirely printed in black and white, the pictorial content and advertisement illustrations being reproduced in half-tone. One of the illustrations, 'Kaiwarawara Flourmill' was notable as being from an early 1857 photograph. Printed and published by Blundell Bros., Limited, at Evening Post Printing House, Willis Street, Wellington, in October 1903, this was a 44 page paper, an offshoot of the successful daily which by then was a thriving business concern, serving both the town and country areas.

The average number of copies sold daily exceeded 15,500, and of this number, over 5000 are sold in the country districts, etc. Our publishing books are open for inspection by advertisers, who are invited to judge for themselves the value of the Evening Post as an advertising medium.⁶¹

That the Christmas numbers for this paper were not analagous to the Christmas and other special productions that were typical from publishers of the weeklies of the time may be due to the different market sector for which they were intended, the daily serving a greater metropolitan than country readership. It may have been because of the success of the letter

press printed Wellington daily: it was already the leading paper, in that it claimed the largest circulation. This was a draw-card to advertisers, and, while this Christmas issue was similarly priced to others at one shilling, the *Post* apparently did not need to spend large amounts on colour printing to obtain an edge:

The *Evening Post* was the first daily paper published in Wellington, and has a larger circulation than that of all other papers, both dailies and weeklies combined, published in the city. It not only contains the latest and most reliable information, but, owing to its far-reaching circulation, its columns are more largely used by the advertising public than those of any other journal in New Zealand...⁶²

However, the *Post* Christmas Annual kept up with the other pictorials in that it used the latest black and white illustrative processes, and settled into an almost entirely pictorial production. The Wellington plant was up-to-date in the process department:

The Commercial printing department is complete with the latest and best printing machines, as well as an up-to-date process-engraving plant for producing half-tone and other work for illustrations.⁶³

The advantage of half-tones was that they could be printed in conjunction with letterpress, as can be seen on both the back and front covers, for instance of the 1903 Annual. An early settler scene on the front cover, an advertisement for New Zealand Government Railways on the verso of the front cover, and, on the verso of the back cover, illustrations in advertisements for the D.I.C. Wellington (the wellknown retailers) were all printed in half-tone rather than being lithographed. Even if it did not print half-tones in colour (and this is inconclusive from the sample examined), none of the journals examined from other firms included colour half-tones except as a special feature, even in the Christmas numbers. This straightforward production must have cut costs to a minimum compared to those for Christmas numbers from other firms where expensive chromolithography was used alongside letterpress half-tone that was often also decorated and tinted with colour. Mostly the front covers were presented in simple colour schemes, for example, in blue, red and black for 1906, and blue and white for 1907, both issues being entirely letterpress. However, the cover for 1905 did feature a rather more elaborate design by G. Clarke, of pohutakawa and clematis lithographed in red, light green, and dark green, with the underlying white paper supplying highlights.

Christchurch: The Weekly Press and the Canterbury Times

The Weekly Press

In Christchurch, the *Weekly Press* was also using colour printing as an inducement to the market to buy: this firm also ran to colour in the special and annual Christmas numbers. Christchurch had been the city in which colour processes were pioneered in New Zealand: chromolithography in the sixties, and tri-chromatic methods in the nineties. The Press Company was technically capable, having engaged John Taylor who had been one of the first to initiate experimentation with screened illustrative methods in New Zealand. A.A.

Smith states that “early in 1894 the *Weekly Press* appeared with half-tone illustrations. This was the first newspaper in New Zealand to make a regular feature of photographic illustrations.”⁶⁴ As has been noted, some of the special numbers, such as the *New Zealand Graphic*, had begun using half-tone illustration before this, but these were annuals. As mentioned, the Press Company had entered the field of illustration early, having published the *Illustrated Press* on a four weekly basis from 1868 to 1883. This journal had “contained a summary of news for despatch to England by the regular monthly mail service”, with illustrations from blocks “mainly from Melbourne.”⁶⁵ In 1865 the *Weekly Press* had been established.⁶⁶

Examination of *Weekly Press* Christmas numbers (also known by the title *New Zealand Illustrated*) produced after 1897 revealed that this firm was using a similar format for such special issues as was proving a success for North Island firms, and this included the presentation of loose colour plates. The cover for the Christmas number for 1897 was chromolithographed on both back and front. The front bore the title “The Weekly Press – Christmas – 1897” in plain red display typography, as well as “Christchurch Press Company, Limited, Printers and Lithographers. Price: One Shilling”. Graphics had been lithographed in brown and black in a stipple style for a Maori maiden and Maori carvings (in both colours), with a circular ‘view’ in black only. The back cover carried advertisements in red and green, which included a half-tone image of the Kaiapoi woollen manufacturing company premises printed entirely in green: quite a typical example of an advertisement printed on the back cover of a weekly from this period.

All colour production in this issue was lithographed, as could be seen from the appearance under x 10 magnification. Responsibility was often indicated in the imprint at the bottom of the back cover, as it was for this issue: “Printed by Horace Daniel Pine, of Hawkes St., New Brighton, and published by John Russell Brunt of Buccleuch Street, Linwood, for the Christchurch Press Company Limited, at their Offices, 208 Cashel St., Christchurch – October 30th, 1897.” The liftout chromolithographed plate (about foolscap in size) stated “Lithographed by the Christchurch Press Company” at the bottom left-hand corner, and “Supplement to the Christmas Number, “Weekly Press” Oct 30, 1897” in the top right-hand margin. Entitled ‘The Swaggers: An Original Picture of Up-Country New Zealand’, this print was intended to appeal to the popular market. (Plate 47.)

This chromolithograph had been printed using several colours: two reds, two blues, and yellow; with many of them overprinted, for instance blue over yellow to form green.

Although orange and brown had been added this was clearly an attempt towards simplification. Shade and contrast had been added by a final printing, in black, of a half-tone picture over the top. This was the year before the first colour half-tones in the country were produced in Christchurch, and experimental efforts were being made to simplify chromolithography as well in the direction of producing all colours wanted from the basic primaries in the mode of tri-chromatic colour printing. This was in accordance with the innovative thrust of the time, but was exploration most likely with a view also to increasing the circulation. As well, copious photographs, printed as black and white half-tones, were presented, some of them full-page.

The photographic content for the *Weekly Press* Christmas number was in step with the demand of the readership for pictures of New Zealand, as much for New Zealanders themselves, and enabled them, through this 'mirror', to become more familiar *with* themselves and their own characteristics as they now appeared in the Antipodean environment, nearly sixty years after the first European settlement. This was a phase of growing national identity. In spite of regional differences, the relatively small size of the country would have been expected to foster the feeling of belonging to 'New Zealand' as a geographical entity. Pictorial content in these journals, especially prominent in the Christmas and other special numbers, often encouraged an outlook that was national, although often this was via the regional. Themes of scenery, industry, the built environment, the natural history, and the people of the country were commonly found in the photographic and artistic content of many of the pictorial weeklies by this time, and the *Weekly Press* was no exception. Typical was a description of an imaginary trip through New Zealand via a miscellany of pictures, which conveys the view of the time of the kind of pictorial content in demand to keep the interest of readers not only at home but also those abroad.

Part of this interest was innovative presentation with layout including the use of colour as a design element. The photographs were often presented as black and white half-tones overprinted with a tint in one of various colours that were commonly used, for example, peach, blue, or maize. Summed up under a heading "Our Illustrations", the following paragraph gives an idea of the range of pictorial material.

Plate 47: 'The Swaggers: An Original Picture of Up-Country New Zealand. "We Can Make it There by Sunset Boys."'

Chromolithographed by the Christchurch Press Company.

Published with the supplement to the *Weekly Press* Christmas number, October 30, 1897.

By permission of the Alexander Turnbull Library, Wellington, N.Z., Newspaper Collection.

Ref. No.: N-P 569-

Starting in Dunedin and travelling northwards, we reach Auckland by rail and boat, and returning by the West Coast of the North Island to Wellington, proceed down the West Coast of the South Island, and finish the tour at Invercargill, whence is reached Queenstown and Lake Whakatipu. Digressions show us scenes of mining in the South Island, of grain growing in Canterbury, and of grain shipment from Lyttelton, Canterbury's chief port; and among many beautiful or curious miscellaneous pictures the two specimens of New Zealand youth and beauty [portraits], and the two remarkably successful photographs of bird-life deserve special mention. The panoramic photographs of towns have nearly all been taken specially for the Press...⁶⁷

The following year, 1898, saw a similar Christmas number, although the liftout chromolithograph, 'A Maori Princess', was not an imitation half-tone, but rather a competent chromolithographic production in fine stipple style (Plate 48), while the cover this time bore a natural history theme: five New Zealand birds chromolithographed in nine colours. Colour printed Christmas numbers from the *Press* were evidently a success: they continued to appear each year afterwards, at least until 1902, and were at a noticeably high standard (for this genre) by 1906. In 1902, there had been a new twist as social advances were being reflected from the pictorial pages of the weeklies and especially large half-tone illustrations were offered, although these did not replace the by now expected chromolithograph, but were introduced as an extra, (although this was missing from the copy examined). However, a description appeared in the issue: 'Our Supplements and Cover':

Published gratis with this Christmas Number are two supplements and two special art pages. The principle supplement is entitled "Spring", a beautiful picture, measuring $13\frac{1}{2} \times 21\frac{1}{2}$, and lithographed in ten colours. The second supplement is a fine picture in monochrome, similar in size, and is called "our Boy" [also missing – presumably it was lithographed]. The two special art pages present respectively a splendid piece of the famed mountain and lake scenery of the South Island of New Zealand, [*Mount Binser* (6078 feet), and Lake Laetitia, both printed in sepia] and a spirited picture specially drawn for this number "A Red Letter Day for the New Zealand Aged: Paying the Pensions", representing one of the most striking scenes of our present social conditions [printed in navy blues]. The Maori greeting which is shown on our cover design, printed in nine colours, illustrates a custom of the Maoris...⁶⁸

The handsome front cover for 1906 Christmas number used geometrical design elements, popular at the time, which were printed using a combination of processes to accomplish an attractive colour scheme in forest green, black, charcoal, white, gold, salmon pink, royal blue and light steel blue for its presentation to the world. A new departure came in the form of two children's pages in the 1908 *New Zealand Illustrated*: both were printed in colours. The first used a simple scheme with a yellow background, red printing, and blue drawings 'coloured in' using prepared tints in blue, green yellow and pink; and the second was a full-page three-colour process reproduction depicting a bad fairy. By 1910 the colour children's pages were continuing, with a duo-tone portrait of a young girl on page 20, and a large four-colour half-tone, 'The Sandgnome' drawn by A.D. Bright appearing on page 21 as an illustration for the story 'The Quicksands'. In colourful oranges, greens, purples and

browns, this was now a very modern-looking effect, and pointed the way to the future for art illustration in the area of children's publications.

Along the same lines, but for the adult readership were two 38 x 33 cm. lift-out four colour process prints provided in the 1912 Christmas number. Both reproductions of artworks, and clearly meant to be framed, the first was of the 91.5 x 76cm 'Kapai Te Koura', a painting by W.A. Bowring that had been exhibited at the Canterbury Art Society's exhibition, and the second was from the 74 x 54cm 'A Reach of the Wanganui River', a privately owned painting by C.H. Howarth. Both had been printed and published by Phineas Selig for the Christchurch Press Company, at their office in Cathedral Square, on October 19th of that year. It can be seen that the Press Company was using satellite printers that were also based in the Christchurch area, suggesting a symbiotic relationship in which technology and skills were being shared.

Colour printing had been presented in the *Weekly Press* Christmas numbers in most of the issues available for examination (every consecutive year from 1897 to 1902; and then 1906 onwards.) The supplements may have been missing from some issues, but in general, chromolithography was favoured over tri-chromatic printing for colour production. The latter process had been pioneered in Christchurch by 1898, and the *Press* did sometimes use it to produce colour pictures, for instance the 1907 mermaid cover, which was also notable for its fine gold printing, and for a colour Ballentynes advertisement on the back of the same issue. However, chromolithography of a good standard was well under control at this firm, and additionally, colour was being presented through the colour tinting of black and white half-tones. It appears the *Press* stayed within a production format for which they were well equipped, putting effort into attaining and keeping up their high standards rather than divesting themselves of chromolithography in favour of colour effects achieved through regular full three or four-colour printing.

For the 1911 Coronation number, a large liftout supplement of King George V and Queen Mary was a 50 x 38 cm. chromolithograph in deep reds, crimson, purple, and creams, with touches of blue and green, clearly expected to be framed. Even if used in an occasional way, at this stage tri-chromatic printing had not taken over at the *Press* either. Colour printing for

Plate 48: 'A Maori Princess.'

Chomolithographed by Wilson & Horton.

Published with the supplement to the *Weekly Press* Christmas Number, October 29 1898.

By permission of the Alexander Turnbull Library, Wellington, N.Z., Newspaper Collection.

Ref. No.: N-P 582.

THE HON. JIM AUCKLAND

A MAORI PRINCESS

the production of the *Weekly Press* annuals and special supplements evidently followed a developmental pattern similar, if not identical to that for its counterparts, where, in general, for the popular market it was the *effect* of colour rather than the attainment of fine standards of colour printing that was the aim. This had largely been accomplished to an acceptable standard by employing relatively coarse-grained chromolithography which had the advantage that it could be produced with existing plant.

Investment in chromolithographic expertise and equipment had been considerable. At the Weekly Press Office colour production for the special numbers demonstrated that making the most of such investment meant ringing the illustrative changes as much as possible by using both the established and the new—by combining the demand for photographic images with the appeal of colour which earlier had been established successfully through chromolithographic presentations. When lithographed colour was employed, usually for the covers, it tended to be in a simplified way as part of a more modern looking design with coloured card again playing a part, this time as a design element that often incorporated embossed effects. For example, the front cover for the 1910 issue demonstrated the new trend: a tui on a spray was presented in this way.

Canterbury Times

Begun in 1865, the associated weekly was established by the *Lyttelton Times* in 1865, when the weekly *Canterbury Punch* ceased after only twenty issues,⁶⁹ but it is thought that the annual did not begin until 1895.⁷⁰ Priced at 6d. per copy, even at the end of the period, this was a less elaborate annual (there were no supplements in evidence), but nevertheless it carried photographs in many of the categories usual for these productions, of buildings, portraits and scenery. Illustrations were printed in a separate section on coated paper, while the news section was on ordinary newsprint. Colour printing was typically used for the covers only, usually in the form of a coarse chromolithograph in a few colours for the design on the front and the advertisements on the back. The format remained the same in all copies examined from 1905 onwards.

Dunedin: The Otago Witness

According to the *Cyclopedia*, The *Otago Witness* which was begun in February 1851 as a weekly, was by 1904 “the only illustrated weekly published in Otago.” In “neat blue covers”, the contents were characterised as containing “variety”, making it “indispensable to to town and country readers alike.” It was seen that “as a consequence its circulation is exceedingly large and continually increasing”, not only in Otago, but throughout the country.⁷¹ By the mid-eighteen nineties, the Christmas annuals associated with this weekly

bore the masthead *The Otago Witness Christmas Number.... A Weekly Journal of Art, Manufactures, Science, Commerce. Agricultural, Pastoral, Pursuits, Mining, Sporting, Music &c.*”: variety indeed!

From the Christmas numbers examined (from 1894 onwards), the first two were modest productions of about 16 pages, also in blue card covers printed in black, with part of the body of the issue printed on ordinary newsprint, and part, the illustrated section, on better quality paper. This pictorial section featured half-tone illustration, but these were of poor quality, for example, the view ‘Mount Cook’, on page 17. Both the front and back covers of the 1894 annual were devoted to advertisements, with illustration still from a woodcut block. The price was sixpence. By 1898, the price had risen to 1/- (this was now in line with similar annuals), for a larger 46 page production containing better quality half-tone illustration. The front cover was missing from the copy examined, but the cover for the following year had changed in character: it was lithographed in a simple colour scheme, featuring a depiction of angels in a rectangular shape printed in blue half-tone on a blue-grey and black lithographed background. The title was now *The Otago Daily Times and Witness Christmas Annual*.

By 1903, this annual had achieved the format which was adhered to until the end of the period under study. The covers were typically chromolithographed, bearing a ‘New Zealand’ design on the front, and colour advertisements on the back, with mainly photographic contents, usually produced as black and white half-tones. By 1900, a lift-out supplement was being provided - not a chromolithograph - but rather a large ‘photograph.’ The one for 1900 was produced as a collage. By 1902 the cover proclaimed the journal as being “Artistic New Zealand in Paintings and Photographs.” The printing was over a design containing a black and white half-tone in a circular space on an artist’s palette that was lithographed in two reds on a green ground, with red, white and black borders and pink, black, red and white decorative lettering. This really was a visual representation of the format that was to continue. The lift-out supplements, often a folded double page, were to remain photographic rather than chromolithographed presentations. The Otago annual was comparable in size and format with others from the main centres such as those from the *Auckland Weekly News*, the *Weekly Mail*, and the *Press*, but did not feature colour printing as much.

Colour effects were sometimes introduced in the photographic content and supplements, but less frequently, and in a generally subtler way, perhaps using a tint in a grey-green.

Occasionally a bolder effect was tried, such as the full-page pictures in lilac or blue, or the green fancy borders around brown half-tone photos seen in the 1912 issue. As was common in others, gold blocking and printing was often a feature of these Christmas annuals, especially as part of the cover production. The imprint, which was often at the foot of the back cover, stated that the Christmas numbers were "Printed and published for the Otago Daily Times and Witness Newspapers Company (Limited)...at the registered office of the company, Dowling Street, Dunedin, Otago, New Zealand...". In 1903, the printer and publisher was George Fenwick.

The chromolithographed covers, like many others of the kind, often featured Maoris, and Maori motifs. Again, the two main colour printing methods co-existed. An example of this is seen in the cover for 1905 which has a tri-chromatic theme, although built from the primaries rather than reproduced by the initial photographic separation of an original into the primaries using filters. Sometimes designs for covers had been produced using as many as ten different colours, for instance, the cover for 1906, which used two yellows, salmon, red, sage, pink, white, grey-blue, fawn, pale blue and brown. In 1907, a loose print which was a reproduction of a painting entitled 'Before the Storm' by F. Loiacono, was included. This was the only such insert seen in the run examined (although others may have been lost). It was a 23 x 35.5 cm. three-colour half-tone, trimmed and ready for framing: a print provided to delight the popular taste. (Plate 49.)

Colour Printing and the Main Centre Weeklies 1913-1914

By the end of the period under study, the *Auckland Weekly News* had absorbed the *Weekly Graphic* and the *New Zealand Mail*, this fact being recorded on a supplement for Thursday July 3, 1913. Writing in 1958, Guy Scholefield attributed the success and survival of this Auckland journal to long after the end of the period under study to the endurance of a relatively large rural population in New Zealand:

The persistence of backblocks conditions over a wide area enabled the *Weekly News* to survive lustily into the second decade of the century, although so many of its kind closed down. In recent years the paper was transformed to meet changing conditions, and today the *Weekly News* is unique—the sole survivor of a type of publication which for 70 years was a feature of New Zealand journalism.⁷²

As well, it might be added, of New Zealand pictorial reportage.

Still priced at 1/-, the *Auckland Weekly News* Christmas numbers for the last two years of the period under study show that the effort to keep abreast of colour printing trends was still in evidence, and that as far as content is concerned, uniquely New Zealand themes were still prominent. On the brightly printed front covers for both years, New Zealand birds were featured, the pukeko for 1913, and the moa for 1914. However, whereas the cover of the

1913 issue had been lithographed in a spatter style in tones of blue, red and gold, the graphics on the front and back of the 1914 cover were four-colour half-tones, a sign that colour printing was advancing towards standardised procedures, while still presenting the public with chromolithographic coloured images which had become so familiar. The colour supplements for 1914 exemplify the reproductive colour pictures being supplied to the market at this time. Both were four-colour process prints, the first, 'A Grey Morning: The Waipa River near Ngaruawahia, North Island, NZ', being from a painting by W. Wright, and the second, entitled 'The Belle of the Swamp: A Direct Camera Study of Maori Life on the North Auckland Gumfields' being from the photograph by A.J. Northwood. (Plate 50.) Other special editions of the *Weekly News* were still appearing, for instance the Exhibition number for 1913/1914, its colourful cover appearing in chromolithographed red, brown, pink, yellow and double blue, showing that the older form of colour printing was not yet obsolete.

In 1913, Henry Brett published a new annual: the title on the front appeared as "Bretts New Zealand Christmas Annual with which is Incorporated The Christmas Graphic". Costing 1/- a copy, its covers were printed in three-colour half-tones depicting Maori carvings on the front and used for advertisements on the back. The many photographic pictures inside were printed monochromatically in neutral colours of grey, sepia or blue. Taking pride of place were several large views now printed as full colour half-tones: 'Below the Falls, Whangarei, Auckland' (p.18), 'Looking up Otira Gorge, Westland', (p.19), 'Henderson Valley, Near Auckland' (p.22), and 'A Glimpse of Fairyland, Lake Whakatipu, Queenstown' (p.23).

The following year, at the end of the study period, a cover in light blue textured paper had been introduced; printed in a stylised manner in blocks of strong colour to create the scene of a boat on a fiord with bush and mountains –this was an entirely new appearance. Of all the special numbers examined, the weekly that from the first had been most presented in a 'magazine' style by this time had provided more pictorial content from up-to-date colour process printing than any others produced in association with that genre from the newspaper

Plate 49: 'Before the Storm.'

Three-colour half-tone reproduction of a painting by F. Loiacono.

Published as a 23 x 35.5cm print with the *Otago Daily Times and Witness* Christmas annual 1907.

By permission of the Alexander Turnbull Library, Wellington, N.Z., Newspaper Collection.

Ref. No.: N-P 587.

Plate 50: 'The Belle of the Swamp: A Direct Camera Study of Maori Life on the North Auckland Gumfields.'

Four colour process print from the photograph by A.J. Northwood.

Published by Wilson and Horton in the *Auckland Weekly News* Christmas number supplement 1914.

By permission of the Alexander Turnbull Library, Wellington, N.Z., Newspaper Collection.

Ref. No.: N-P 591-SUPPL

THE BELLE OF THE SWAMP.

(See page 100 for description of the costume.)

W. H. Burrows, Jr., artist.

houses, the weekly, which by then had become so much part and parcel of locally produced reading matter. However, not to break faith with the expectation of the customer, a lift-out chromolithograph was still provided with the 1914 annual entitled 'Maketu House, Otawhao Pah', which was built by Puatia to commemorate the taking of the Maketu. It was lithographed at the New Zealand Graphic and Star Printing Works, Auckland.

By 1914, the Wellington *New Zealand Free Lance* had remained similar in character to its earlier issues, and continued to be printed and published at the office in Panama Street, but now by Arthur Claude Geddis. The simple style of the colour printed front covers must have been considered a market success: they had been retained, as was the humorous tenor of the journal, with many cartoon stories, rather than the 'pictorial New Zealand' of many of the other weeklies. Colour printing, however, in both the 1913 and the 1914 issues had disappeared from the body of the issue, and was a feature of the covers only. For 1913, the cover was lithographed boldly in yellow and black on green card, and in 1914 in dark blue and red on bright blue card, with advertisements on the back in similar colours for each year respectively.

In Christchurch, the *Weekly Press* Christmas numbers at the end of the period were notable for beauty of design and their attractive colour printing, particularly the 1914 issue. The front cover, of a dark grey-green thin card for 1913, was lavishly printed with a design in orange and two shades of green, light and dark, and with gold and white lettering in an embossed style, with similar effects for the advertisements on the back (gold over red), while advertisements on the inside of the covers were printed in dark blue. Unity of design was obtained in the body of the paper also by the use of colour, for instance, a fine dot pattern was printed in maize-yellow by way of adding an underlying tint to half-tone photographic images, and the same colour was used in plain colour, perhaps for a decorative border, offset in grey, or sometimes used to simply highlight a portion of a portrait. Such devices were used again in the 1914 issue, while the front cover was chromolithographed on cream card with a slightly indented pattern, shades of avocado green and salmon, featuring small areas of mechanical tins, gold blocking offset with black ruled borders, and with the display lettering also in black. The *Weekly Press* Christmas numbers for these last two years of the study period showed that a similarly produced pictorial format was continuing, with chromolithographed colour still in full swing, an indication of its favourable reception in the popular market to which it had been directed.

The issues of the *Canterbury Times* for the two years at the end of the period were by now featuring new categories of pictorial content, such as gardens and sports teams, as well as “news” shots, of events such as a train accident, with some images being printed in blue rather than black ink to provide variety. Colour printing was mainly still reserved for the covers, which in 1913 appeared in several: brown, red, light blue, yellow, and light purple, with green formed by overprinting blue on yellow. A half-tone portrait printed in two shades of red within a design in grey decorated the front cover for 1914. It was made clear that the photographic content was not borrowed from elsewhere, and the idea of exclusivity was introduced:

Attractive illustrations from photographs specially taken (copyright), artistically printed on art paper. Only a limited number of copies available for casual sale. Bulk of large edition bespoke. No second edition possible.⁷³

Evidently going mainly to subscribers, this production was printed and published by Frank Eugene Hyman, of 361 Cambridge Terrace, Christchurch for the Lyttelton Times Company, at the Office, Cathedral Square and Gloucester street, as stated in the 1914 edition. This marketing technique perhaps suggests that the interest of collectors was being sought to create a list of known subscribers that would in future allow assured sales to that market segment.

In Dunedin, The *Otago Witness* Christmas numbers for 1913 and 1914 were again typical of these specialised annuals in size and price, with the covers chromolithographed in several colours, and pictorial supplements executed using the latest half-tone processes. Both of these yearly issues were printed for the Otago Daily Times and Witness Newspapers Co. Ltd. by the printer Josiah Lye, of Elgin Road, Mornington, and published by Magnus W. Johnston, of 53 Ann St, Roslyn, at the registered office of the company, Dowling, High and Macandrew Streets, Dunedin, as stated on the back covers. The large photographic supplements, also printed by Josiah Lye, were on art paper. For 1913, these were of panoramic scenes, as well as a portrait in grey-blue half-tone in a pale blue surround, while for 1914 the supplement, between pages 36 and 37, was an oval half-tone portrait by J. Steadman, of “ “Acme” photo”, printed in sepia coloured ink, on a grey ground within ruled borders.

The front covers for both years were chromolithographed in several colours, using stipple effects to fill in an outline design of a fruit-tree and a country girl holding fruit on a plain blue background. Fruit was again featured on the 1914 poster-like cover, showing an spray of apples attractively lithographed in a dot pattern to make a three-colour half-tone effect, finished with tiny specs of gold over the image. Thus for graphic effects, the combination

colour printing styles also persisted in Dunedin to the end of the period under study for the Christmas numbers associated with a weekly. These issues were similar in kind to the *Weekly News*: pictorial productions with half-tone photographs, for instance of views and buildings, pictures that would appeal to a general audience appearing prolifically amongst the text, as well as for advertisement illustration. Here, too, advertisements on the back covers were printed in bold colours, for example, in 1914, in a combination of red, blue and black.

It had been the older chromolithographic processes which had been responsible for the provision of reproductive art-work for which the popular market had cultivated an expectation, and that seemed to have become something of an annual tradition that had started from around the nineties in the Christmas and other special numbers that were typically associated with the weekly newspapers in New Zealand. Before the end of the nineteenth century, such chromolithographic presentation of colour had seemed to attain a momentum of its own. However, modern colour half-tones were increasingly presented in the early years of the twentieth century, especially in the last years of the study period.

¹ *The Canterbury Times*, January 10th, 1895: 23T

² *Typo*, 5 (April 1891): 55.

³ Tolla Williment, *150 Years of Printing in New Zealand* (Wellington: Government Printing Office, 1985), 28.

⁴ *Typo*, 5 (January 1891): 11.

⁵ *Typo*, 5 (December 1891): 157.

⁶ *Auckland Weekly News*, December 15th, 1888: 16. The circulation notice appeared frequently in the pages of the *Weekly News* (in the late 1870s and in the 1880s.)

⁷ *Typo*, 6 (December 1892): 92.

⁸ P.A. Griffith, Ross Harvey and Keith Maslen, eds., *Book & Print in New Zealand: A Guide to Print Culture in Aotearoa* (Wellington: Victoria University Press, 1997), 130.

⁹ *Auckland Weekly News*, December 19th, 1885, 16, and June 26th 1897, 9.

¹⁰ *Auckland Weekly News*, June 26th, 1897: 9.

¹¹ Ian Morrison, 'Cook's Choice: Reflections on Trans-Tasman Literary Culture', paper given at 'Remembering Don McKenzie', a conference organised by the History of Print Culture in New Zealand in association with the Stout Research Centre, Victoria University of Wellington and the Alexander Turnbull Library, 12-14th July 2001.

¹² Alexander Turnbull Library, Cartographic Collection, item, 832.4gbbd 1882.

¹³ 'Newspapers', in *Current Affairs Bulletin*, 5 no.11 (1950): 174.

¹⁴ Patrick Day, *The Making of the New Zealand Press: A Study of the Organizational and Political Concerns of New Zealand Newspaper Controllers, 1840-1880* ([Wellington, N.Z.]: Victoria University Press, [c1990]), 238.

¹⁵ Ross Harvey, 'Economic Aspects of Nineteenth-century New Zealand Newspapers', in *Bibliographical Society of Australia and New Zealand Bulletin (BSANZ)*, 17 no.2 (1993): 65.

¹⁶ *Auckland Weekly News*, June 26th, 1897, 9.

¹⁷ Guy H. Scholefield, *Newspapers in New Zealand* (Wellington: A.H. & A.W. Reed, 1958), 86.

- ¹⁸ For instance in *Fields of Golden Daffodils: Themes in New Zealand Newspaper and Magazine Photography 1890-1970*. Exhibition Catalogue, Athol McCredie, curator [Wellington: The Library, 1991], 12; and Susan Bartel, ed., *Working Titles: Books that Shaped New Zealand*, Janet Snell, photographer (Wellington: National Library of New Zealand, c1993), section: 'Putting Us in the Picture'.
- ¹⁹ R.A. McKay, ed., *A History of Printing in New Zealand 1830-1940* (Wellington: R.A. McKay for the Wellington Club of Printing House Craftsmen, 1940), 244.
- ²⁰ Scholefield, *Newspapers in New Zealand*, 89.
- ²¹ Hermen M. Schwartz, 'New Zealand', chap. 5 in *In the Dominions of Debt: Historical Perspectives on Dependent Development* (Ithaca: Cornell University Press, 1989), 179-180.
- ²² The subject has been discussed by Peter Franks, in *Print and Politics: A History of Trade Unions in the New Zealand Printing Industry, 1865-1995* (Wellington: Victoria University Press, 2001), and by A.E.J. Arts in *A History of the Canterbury Master Printers' Association, 1889-1989* (Christchurch: Printing Industries Association of Canterbury, 1989).
- ²³ *Auckland Weekly News*, December 15th 1888, 16.
- ²⁴ *Auckland Weekly News*, July 15th 1876, 24.
- ²⁵ *Auckland Weekly News*, circulation notice appearing frequently in the late seventies.
- ²⁶ Harvey, 'Economic Aspects of Nineteenth-century New Zealand Newspapers', 56.
- ²⁷ *Ibid.*, 65.
- ²⁸ Scholefield, *Newspapers in New Zealand*, 86.
- ²⁹ *Auckland Weekly News*, August 21st, 1880, supplement: 1.
- ³⁰ *Auckland Weekly News*, January 1st, 1881, 14.
- ³¹ *Auckland Weekly News*, June 26th, 1897, 11.
- ³² *Auckland Weekly News*, December 15th, 1883, 16.
- ³³ *Auckland Weekly News*, December 12th, 1885, 16.
- ³⁴ *Auckland Weekly News*, December 10th, 1887, 16.
- ³⁵ Alexander Turnbull Library, Drawings and Prints, item: B-033-020.
- ³⁶ *Auckland Weekly News*, December 15th, 1888, 16.
- ³⁷ *Auckland Weekly News*, December 22nd, 1888, 25.
- ³⁸ *Auckland Weekly News*, December 21st, 1889.
- ³⁹ *Auckland Weekly News*, December 20th, 1890, 10.
- ⁴⁰ *Auckland Weekly News*, October 6th, 1894, 48.
- ⁴¹ Bamber Gascoigne, *How to Identify Prints: A Complete Guide to Manual and Mechanical Processes From Woodcut to Ink Jet* (London: Thames and Hudson, 1986), section 107.
- ⁴² *The Auckland Weekly News*, November 30, 1895, 15.
- ⁴³ *The Auckland Weekly News*, December 18, 1897, 17.
- ⁴⁴ *The Auckland Weekly News*, Christmas number, September 15, 1898, 31.
- ⁴⁵ *Ibid.*
- ⁴⁶ *Typo*, 4 (June 1890): 69.
- ⁴⁷ McKay, ed. *A History of Printing in New Zealand 1830-1940*, 231. This date could have been derived from the *Cyclopedia of New Zealand: Industrial, Descriptive, Historical, Biographical Facts, Figures, Illustrations, 1897-1908* (Wellington etc.: Cyclopedia Co., 1897-1908), 2, 271, although the same volume dates the commencement of the *New Zealand Graphic* at 1890, which seems correct.
- ⁴⁸ *Cyclopedia*, 2, 125.
- ⁴⁹ *New Zealand Graphic*, Christmas number, 1903.
- ⁵⁰ *Free Lance*, 7th July, 1900, 6.
- ⁵¹ National Library of New Zealand, *Fields of Golden Daffodils*, 12.
- ⁵² Bamber Gascoigne, *How to Identify Prints*, 19a.
- ⁵³ National Library of New Zealand, *Fields of Golden Daffodils*, 12.
- ⁵⁴ *New Zealand Mail*, Christmas number, 1896, 22.
- ⁵⁵ *Ibid.*, 32.
- ⁵⁶ National Library of New Zealand, *Fields of Golden Daffodils*, 12.
- ⁵⁷ Alexander Turnbull Library, Ephemera Collection, item: Eph-C-Newspaper-NZ Mail-1903-01.
- ⁵⁸ *New Zealand Mail*, Christmas number, 1899, back cover.
- ⁵⁹ Lucy Brown, *Victorian News and Newspapers* (Oxford: Clarendon Press, 1985), 31. "In the last thirty years of the century the fall in the price of newsprint was greater than the fall, say, in the prices of wheat or coal."
- ⁶⁰ *New Zealand Mail*, Christmas number, 1903, 8.
- ⁶¹ *Evening Post*, Christmas number, 1903, 31.
- ⁶² *Ibid.*
- ⁶³ *Ibid.*

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- ⁶⁴ A.A. Smith, *Printing in Canterbury: A History of Newspapers and Printing Houses of the Province From the Earliest Times* (Christchurch: Christchurch Club of Printing House Craftsmen, 1953), 47-48.
- ⁶⁵ Scholefield, *Newspapers in New Zealand*, 220-221.
- ⁶⁶ Harvey, *Union List of Newspapers*, entry for *Weekly Press*, 47.
- ⁶⁷ *Weekly Press*, Christmas number, December 1899, 38.
- ⁶⁸ *Weekly Press* Christmas number, December 1902, 46.
- ⁶⁹ Scholefield, *Newspapers in New Zealand*, 217.
- ⁷⁰ National Library of New Zealand, *Fields of Golden Daffodils*, 12.
- ⁷¹ *Cyclopedia*, 4, 227-230.
- ⁷² Scholefield, *Newspapers in New Zealand*, 86-87.
- ⁷³ *Canterbury Times*, Christmas number, October 21st, 1914, 14.

Figure 8: New Zealand Weeklies/General Magazines Featuring Colour Printed Christmas or Other Special Numbers.

Name of General Magazine Or Newspaper	Dates	Place	Colour Printing Pre-1914 in Associated Annual/Special Numbers
Auckland Weekly News	1863-1971 (v. A.W.N.)	Auckland	Yes
Brett's Christmas Annual (Annual)	1914-1940	Auckland	Yes
Canterbury Times	1865-1917 (v. H.)	Christchurch	Yes
Evening Post (Daily)	1865- (v. H.)	Wellington	Yes
New Zealand Free Lance	1900-1960 (v. H.)	Wellington	Yes
New Zealand Graphic (Weekly Graphic and NZ Mail, 1908-1913)	1890-1913 (v. H.)	Auckland	Yes
New Zealand Illustrated Sporting & Dramatic Review	1890-1942	?	Yes: Limited
New Zealand Mail	1871-1907 (v. H.)	Wellington	Yes
New Zealand Observer (The Observer, 1931-)	1880-1954	Auckland	Yes: Limited
New Zealand Yachtsman	1909-?1918	Auckland	Not seen
Otago Witness	1851-1932 (v. H.)	Dunedin	Yes
Weekly Press	1865-1928 (v. H.)	Christchurch	Yes

v. H = verified in Harvey, D.R. *Union List of Newspapers Preserved in Libraries, Newspaper Offices, Local Authority Offices and Museums in New Zealand* (Wellington: National Library of New Zealand, 1987).

v. A.W.N = verified *Auckland Weekly News*.

SECTION V

New Zealand Colour Print Products in the Marketplace

CHAPTER 11 PRINTS, MAPS AND EPHEMERA

Research Question

6. *What were the colour print products and market drivers for colour printing in New Zealand, and how did they differ from the colour print products and market drivers in Britain. How did the New Zealand colour printers respond to these differences?*

Part 1: Prints

Antipodean Prints

As with art that was produced elsewhere, much art that was made concerning Australia and New Zealand, including the prints that were made during the study period, can be viewed in several ways—for instance, as objects of aesthetic merit valued in financial terms, as images intended to serve a documentary function, and in a semiotic sense as images capable of conveying layers of meaning that may be imparted in the manner of language. In the colonial environment a major thrust was towards the documentation of the new surroundings, and part of that was the making of images intended as a means of data collection for empirical purposes, as exemplified, for instance, by the prints of the terrain observed by Dobson and Haast. But images played many other parts both at home and abroad. For instance, some fulfilled a reflective function and were instrumental in the establishment of feelings of identity while others that were used to promote tourism were in the nature of advertising used for economic purposes. Some images were created to realize an aesthetic aim, acting as a means of celebrating beauty in its myriad forms, sometimes combining this role with other more practical functions. Many images were capable of conveying a variety of meanings, but the particular role of printed images, because of their intrinsic ability for multiplication, was to convey an array of meanings to the wider marketplace, and in this context, colour was a factor that could not only increase desirability, but through its potential for multifarious visual effect, could also increase the meaningful content.

As already mentioned, many early prints portraying images of various aspects of the Australasian environment, whether of indigenous people, the landscape, the fauna and flora, or of the early signs of European settlement, had usually been produced from original watercolours and drawings that were repatriated to Britain for printing. Early New Zealand examples included images of the Maori by Augustus Earle that were published in 1832 as

aquatint prints entitled *A Narrative of Nine Months' Residence in New Zealand*. An example of a production of the forties that was published in London although with New Zealand content was George French Angus' *New Zealanders Illustrated*, said by E.M. & D.G. Ellis to be "one of the most important collections of New Zealand prints, and certainly the most valuable in monetary as well as artistic terms."¹ Published by Thomas McLean in 1847, the sixty lithographic colour plates had been printed in tints and then had further colours added by hand. They were from originals by Angus, the son of George Fife Angus, one of the commissioners of the South Australia Association which had been formed to colonise that state. It had been in 1844 that George French Angus had travelled to New Zealand to collect sketches and paintings for that work.

The continuing tendency for reproductive printing of early New Zealand images (especially those produced in colours) to be executed in England, where expertise and technology was established, has led to the existence of many prints with local subject matter that bear the imprint of an English printer of the time. For instance, some of the Baxter colour prints that have survived are reproductions of original images from colonial New Zealand and Australia. The two companion Australian gold-fields prints mentioned in chapter 4, 'Australia. News from Home' of 1853 and 'News from Australia' of 1854 (both 6 in. x 4¹/₄ in.) were, from examination, both in browns, orange/reds, greys and navy. The former depicts settlers in their hut at the gold-fields, one reading an account of the Great Exhibition—an aborigine has just brought a letter from home. The latter shows a family group beside the hearth, with a young woman reading a letter in which a £100 note was enclosed, while her parents, an old cobbler and his wife, listen.² These, said by C.T. Courtney Lewis to have been two of Baxter's most popular prints, were both produced from twelve blocks and both originally sold for 1s 6d.³

A New Zealand example, thought to have been printed around 1846, is of a New Zealand scene entitled 'Wesleyan Mission Station at Waingaroa' from an original ink and watercolour by the Reverend James Wallis. Depicting the mission station on the Waingaroa River, as well as canoes and figures (both Maori and Pakeha) all against a backdrop of Mt Karioi, it has been printed in greens, blues, brown and yellow, and bears the imprint "Baxter's Patent Oil Printing. 11, Northampton Square" at the bottom on the right-hand side.⁴ Also from this early period is the 1843 'The Lamented Missionary, the Revd. John Williams' for which the tonal patterning is so unobtrusive and subtle as to resemble an oil painting, the characteristic for which Baxter's prints were renowned. This portrait is richly printed in greens, yellows, navy, maroon and flesh tones, and with the lights giving a life-

like quality. The imprint "Published by G. Baxter, 3 Charter House Square, April 1st, 1843" appears at the bottom.⁵ An example of a print thought to be from around 1845 purported to be by a Baxter licensee, the untitled image ['Omai Farewelling Captain Cook'] also in blue, greens, brown and yellows, which bears "Baxter Print (licensee)" in pencil on the bottom records an early incident, although in printed tones that appear far less subtle than Baxter's.⁶

Later 19th Century New Zealand Colour Prints

After chromolithographic colour printing took root in New Zealand, local printers possessed a potential means for colour print production, and in the decades that followed, it was used as the means for reproducing New Zealand art for wider circulation. Such reproduction appeared commercially as colour plates in a few published books, for instance in *New Zealand Illustrated*, which tended to be marketed by means of subscription at home and in Britain, but also as single prints, such as those circulated with the special numbers of the weeklies. As mentioned, with the population influx during the gold rushes many had come who later set up in business in the printing trade, including the German lithographer John Diedrich Schmidt. Born in Bremen in 1839, Schmidt had arrived in New Zealand in 1860, later making lithographs of the west coast gold-mining areas, for instance the chromolithograph 'Greymouth' which was one of several published by Harnett and Co. in Hokitika. Lithographed by Schmidt after a sketch by William Marshall Cooper around 1869, this example is a print from the early years of locally executed New Zealand commercial chromolithographs.⁷

It is ironic that some of the more widely exhibited New Zealand landscape paintings of the nineteenth century were painted by the Australian immigrant artist Eugene von Guerard, a printmaker as well as a painter, who had made a painting expedition to New Zealand in 1876, during the time that he was Master of the Painting School at the National Gallery of Victoria. The landscapes that resulted were instrumental in raising the awareness in viewers of the impressive New Zealand landscape, thus continuing and heightening market interest in images of the neighbouring colony New Zealand. Such interest, especially that of the northern hemisphere overseas market in exotic images, had already been well-served by paintings and prints depicting the rich flora of New Zealand, as well as by works that portrayed species of the native fauna. Over the years numerous prints had appeared, both hand-coloured and colour-printed, most of which had hitherto been printed overseas, but, as time went on, with more from local firms. Such visual interpretations appearing in the marketplace, the individual prints, the plates in publications, and the accumulation of original paintings and drawings, were, besides fulfilling a documentary function, creating a

realization both at home and abroad, of the the environment of many-faceted beauty possessed by the colony of New Zealand.

In 1888 the first art gallery in New Zealand, the Auckland City Art Gallery, was opened, this event being indicative that within New Zealand itself there was a growing interest and focus on art, including a greater awareness of local art. A few years earlier, in 1882, the Christchurch School of Art had been established, an important event in that it enabled local talent to be trained. 1888 had also been the year in which the first full colour chromolithographic print had appeared as a lift-out in the Christmas number of the *Auckland Weekly News*, signalling the beginning of a more continuous use and showcasing of the colour work of local artists and lithographers. Through special productions such as these, the taste for the coloured image was being fostered in the more commonly available print media. The appearance of this type of chromolithograph had another effect. As pointed out by Anne Kirker, in spite of the fact that such images were frequently of a dubious standard in aesthetic terms, "these prints did indicate the presence of an audience appreciative of graphic art, and had opened the way for the development of creative printmaking."⁸ As mentioned, exhibitions were other public fora that served to allow quality comparison. Even in the Australian colonies, there had been little art publishing. Leigh Astbury has said that it had not been until 1899 that the first art volume published in Australia appeared. In that year

Lionel Lindsay produced *A Consideration of the Art of Ernest Moffitt*, in a limited edition of 200 copies, in memory of his fellow artist and friend. This 'in memorium' publication has been claimed as 'the first art volume published in Australia', while as an example of fine printing it presages developments in the twentieth century.⁹

Artists' Prints in Colour

It was in the eighteen eighties that the artist Peter McIntyre, who was cartoonist for the *Otago Daily Times*, had begun making coloured prints. In 1887 he had made a reproductive colour lithograph after a painting by A.H O'Keefe entirely from the press. About a year later he made the O'Brien reproductive chromolithograph already alluded to. However, in the commercial arena, chromolithographs such as those produced around 1869 by John Schmidt in Hokitika had been in circulation. By September 1886 William Potts had

Zealand Graphic and Descriptive had in 1873 been obliged to travel back to England to assist in preparations for that publication.

In 1889, back again in New Zealand, Barraud had become the first President of the New Zealand Academy of Fine Arts in Wellington,¹¹ a role in which he was able to foster local art. This was just at the time the capability of local colour printers was becoming equal to the task of some reproduction of local works of art as prints, many envisaged to appeal to markets both at home and abroad. For the locally printed colour image, this was significant in that local artists, for instance, the painter Kennett Watkins, were beginning to gain commissions to produce originals that were to be used specifically to print commercial print editions, often in the form of chromolithographs, including those that were distributed as supplements in the special numbers of the weeklies. The coincidence of a rising awareness of local artwork with a growing colour printing capability, particularly on the part of the larger commercial printers, began to both satisfy and stimulate the market, so that chromolithographic print production increased, but mainly at the popular level: locally executed fine art reproductive colour print production was to remain uncommon in the commercial sphere in the study period, as were such local symbioses as artists producing works for colour print portfolio or art book publications such as that envisaged by the Featons.

In the New Zealand colonial situation where the small population often dictated that in the sphere of business one individual played a variety of roles, and in a new socio-economic climate where commercial structure was in a formative state, the lines between private and commercial business were more often blurred than was the case in Britain. Even so, during the period to 1914 it is the historical fact that few artists were working in any private capacity in the area of printmaking, and it is not surprising that in such circumstances, few works considered to be of any real artistic merit were appearing in New Zealand from private printmakers during the period under study, although there were signs of improvement in the last decade. Anne Kirker mentions a Christchurch artist, Leonard Booth, who was exploring lithography as a fine art in 1909.¹² In the short history of printmaking in New Zealand that appeared as an introduction in the catalogue produced for the Print Council of New Zealand exhibition in 1969, Gordon H. Brown stated:

The first work of any real substance was produced in Christchurch in the decade preceding World War I: the leading exponents being Richard Wallwork and Flora Scales, with A.J. Rae of Timaru who was possibly the first to produce mezzotints in the country. In Wellington during this period the two Barrauds were active but the most important prints came from H. Linley Richardson who later shifted to Palmerston North.¹³

E.N. Barraud and W.F. Barraud, both sons of Charles Barraud were, like their father, artists who produced prints as well as paintings, and besides becoming known as watercolourists, also had made their names as etchers. H. Linley Richardson, whose father had been a commercial artist, designer and watercolourist, had been trained in London and Paris, at Harry Blackburn's school for drawing for the press, and at Goldsmith's College of Art,¹⁴ before coming to Wellington in 1908 to take art classes, initially at the Technical College.¹⁵ However, Richardson, who had continued his own work in drawing, painting and etching, and who is also known for illustrative work and stamp designing, is considered to have been one of the few printmakers working in New Zealand from whom prints of consistent quality were coming, not only in the period to the first World War, but also through the decades of the twenties and thirties when more artists were being brought to New Zealand to improve art teaching in the country, and who were beginning to work in the field.¹⁶ Richardson's great interest in Maori life is apparent in his work for which Maori life and customs were often the subject matter, for instance his 'Mihi Matawa' depicting Maori women weaving.¹⁷

Although the early history of artists' prints made in New Zealand paralleled that in Australia in the sense of the meagre number of works of a good standard that were produced in the medium in both countries, later, prints as a genre were to achieve more dominance in Australia, whereas printmaking was to remain a modest medium in New Zealand throughout the twentieth century. For the private printmaker in the colonial context, the exploitation of the possible rather than a striving for any theoretical ideal in the sense of competing in the international art arena was a *modus operandi* that can be seen as consonant with the Antipodean printmakers' position of relative cultural hardship, where the isolation militated against much discourse and fellowship with a community of artists. It was often the case that training was obtained overseas, and those who returned contributed to local expertise. In fact it was not to be until 1922 that the first exhibition of New Zealand prints was mounted at the Dunedin Public Art Gallery,¹⁸ and the establishment of the Print Council of New Zealand did not occur until 1967.

Commercial Colour Prints Concerning New Zealand

In the commercial arena, by the eighteen sixties lithographs with New Zealand subject matter produced in tints were more commonly being printed locally, although many others were being printed in England. Some prints originally produced as plates in book publications were later detached, perhaps to be hung as individual works. An example from this period is the print which was originally lithographed from a John Gully original by Day and Son, but which was later redrawn to reproduce as a lithograph in tints by Hanharts in

London. Entitled 'New Plymouth, Taranaki, New Zealand,' it was published in the 1863 *Incidents of the Maori War* by Sir J.E. Alexander. As a printed item this panorama of New Plymouth was an early townscape which can be seen to have been executed in a very similar colour scheme and manner to that which had been employed for the views printed by Ward and Reeves as part of the 1866 *Haast Report*. It was in colours of silvery grey, pale orange and white, with tonal greys shading into black, and with slightly darker tones of orange achieved from the shades in the key drawing, and by overprinting the silvery grey.¹⁹

In the seventies, as local commercial colour work was becoming more common, prints like 'City of Auckland. New Zealand', were beginning to appear. This example, published by G.T. Chapman in 1876, included many detailed features. Accompanied by a key to indicate names, this 57 x 90 cm. print had been coloured using tint lithography, as was typical for local prints of the time. At the bottom the acknowledgement "drawn by A. Hutchinson, from a sketch by J.M. Hammett" and "Chromo-lith. By W.C. Wilson" appeared. Although this particular print was essentially a lithograph in tints in which a pale orange tint had been applied from the press to a key lithographed in black, with the clouds in the sky suggested by scraping out the whites, it is an interesting case, since, by using a stipple style of lithography, extra colour had been employed to indicate the tonal contrasts. Darker tones of orange had been achieved by a denser stippling, for instance to pick out selected buildings, such as "Masfield's Iron Foundry" while areas of less dense stippling resulted in the lighter tones.²⁰

The eighteen seventies was also the decade in which the folio production of the series of prints *New Zealand Scenery: Chromo-lithographed after Original Water-color Drawings by John Gully; With Descriptive Letterpress by Julius Von Haast* had been published, for which Marcus Ward had carried out the chromolithographic colour printing to bring these images of New Zealand to the market. The publishers had been Marcus Ward in London, and Henry Wise in Dunedin. Such a distribution and marketing strategy afforded the opportunity for such publications to be undertaken that could otherwise not be afforded by an almanac publisher like Henry Wise. The two places of publication for this 1877 production echo the by then dual identities of many colonists with both New Zealand and Britain. Colonists were endeavouring to perpetuate their partial identity with 'Home' by duplicating in the Antipodes what they saw as the desirable features of the culture they had left behind. The prints in *New Zealand Scenery* were presented to feed that dual identity, by finding similarities between the old land left behind, and the new, "the Great Britain of the South" to which they had come. It was natural to look for similarities to ameliorate feelings

of being confronted with a totality of newness. At the same time the advantages awaiting those who were yet to come were reflected as the beauties of the Antipodean environment were portrayed. (See also chapter 9.)

Although the standard of the chromolithographs in *New Zealand Scenery* is high, the colours appear to have been derived from a palette that leant more to the reds than the blues, so that the blues and greens are not as clear as those typically seen in the New Zealand landscape, even allowing for the dull weather that had sometimes been experienced by the artist when painting the originals, for instance, that used for 'Bradshaw Sound, Otago'. The palette seems more suited to depiction of the British landscape. Built from several colours that included two reds, a mustard yellow, dark brown, light brown, and two greens, as well as white, the print has more of a brown cast than would be expected for a faithful representation of this region, which, according to the introduction, was the aim. For the view 'Up-River Scene, Wanganui, Wellington' for which accompanying text mentions that "it is a fine sunny day" the shadows appear as browns rather than as the inky blues of New Zealand. The small touches, such as the depiction of canoes on the river are reminiscent of such touches in the scenes later chromolithographed by A.D. Willis. In the print 'New Zealand Vegetation. Open Country', depicting the Motueka River with Table Mountain in the background (now known as the Arthur Range), as well as the indigenous flaxes, cabbage trees and toe-toe, there are effective tonal contrasts in light and colour, for instance, the contrasting pale blue shine of the river against the bright orange-red of the flax flowers. Such chromolithographic prints were not only presenting New Zealand to the world and to the colony alike, but may also have acted as a cue for the later view chromolithographs that were to appear from local colour printers in various formats, especially those from A.D. Willis of Wanganui.

From the early period of European settlement in New Zealand, locally produced tinted lithographs had sometimes accompanied engineering reports; occasionally used to superimpose details of works to be undertaken, for instance for roading or bridges. By the eighties, more extensive colour was sometimes being added to views of this sort as well. Some chromolithographic views were being produced to graphically present envisaged 'Works'. An instance is 'A Birdseye View of Greymouth Harbour Shewing Proposed Works' that had been chromolithographed in 1885 by Lyon and Blair of Wellington in two blues, yellow, brown, red, pale orange and green, (not produced by overprinting) and with the key, probably transferred to the printing surface by photographic means, printed last in black in a style reminiscent of that used for the A.D. Willis chromolithographs in the same

decade. "E. Pentelow, Del" and "Lyon & Blair, Litho." appeared at the bottom of this hybrid print/plan on which numbered points and dotted lines had been added in red to show proposed 'Works':

- No 1. Entrance to lagoon channel, to be dredged
- No 2. Extension of South breakwater
- No 3. North Breakwater
- No 4. Training Wall ²¹

This item was reminiscent of the Dobson report of 1865 (discussed in chapter 9) in which proposed works had been superimposed by means of dotted or broken lines, in that case, over illustrative tinted lithographs.

For the slightly later 1887 coloured lithograph 'Ngatapa from the East', mentioned in chapter 6, prepared tints were partly used to colour a key taken from a pen and ink drawing by J.C. Richmond that had been printed in brown. This was one of the prints that had been produced at Henry Brett's Star Steam Printing Company originally for publication in T.W. Gudgeon's 1887 *The Defenders of New Zealand*. Blue and grey swirling dot patterns were used to add tones to parts of the print, while a blue pin stripe was employed in other parts, sometimes over a pale yellow solid printed underneath to give the greens, and pictorial symbols in blue were used to render a bushclad slope.²² In the commercial arena, prints such as these indicated that by then innovative printers were experimenting with such prepared tint techniques as they sought ways of bringing colour to the local market in a cost effective way. It was not long after this that the era of colour supplements being provided with the weekly special numbers had begun, with many of these including coloured lithographs. These were often in the form of loose prints, in which such graphic techniques were frequently in evidence.

Some New Zealand artists, especially women artists, for instance, Martha King, Fanny Osborne, Sarah Featon, Georgina Hetley and Emily Harris, had begun concentrating their efforts towards the depiction of the New Zealand flora in colour, particularly in the later nineteenth century. Many of these works were destined for reproduction as prints that were often published as art-books, but for these the colour printing was rarely executed locally in New Zealand. However, as the publication of prints on a commercial basis for the special numbers of the weeklies began to form part of the output of the local colour printers, sometimes flower prints by well-known artists such as these, as well as by other less-known artists, were among colour prints being locally reproduced for distribution in this way. A colour print of this category was the huge (19.5 x 26 inch) chromolithograph of colourful flowers in a flax woven kete that was printed at Henry Brett's New Zealand Graphic and

Star Printing Works for Christmas 1905. Entitled 'New Zealand Wild Flowers, Some of the Beautiful Bush Blossoms from Native Shrubs and Trees', it was from an original by the artist Jessie Brown, which the lithographer had reproduced using mechanical tints of the day to render some of the colouring. For instance, tones in this print had been almost entirely built from the use of such patterning, including added stipples and dots, rather than from the use of any key, although short lines had been typically drawn, for instance, at the edge of a leaf, to increase perspective. A fine blue dot and a pinky-grey pattern resembling a collotype had been used for the background, in the manner of the overseas trends of the period. Overprinting of solids was also evident, for example, in the depiction of the kaka beak blossoms, where yellow was overprinted partly with red to give extra brightness, after which red and blue stippling had been superimposed to give the desired colours and tonal contrasts.²³

Prints with similar subject matter had been produced by Brett's graphic artist William Schmidt, who was responsible for this 1905 reproduction, from at least the turn of the century. William Schmidt was the son of the German lithographer John Schmidt who had worked in Hokitika in the eighteen sixties, but who later accepted commissions from Henry Brett in Auckland at his adjacent lithographic establishment. It appears that Schmidt had merged his plant with Brett's at the time of their brief partnership.²⁴ William was credited with the chromolithography for 'The Flowers of New Zealand' which dates from around 1900 (for which the imprint is missing), in which he had used a similar partial outline style, perhaps at an experimental stage. To build the image, in some parts Schmidt had used a dotting technique to suggest an outline, in grey or perhaps brown, together with short thick or thin lines, and in others, patches of overprinted colour.²⁵ The 'Native Birds of New Zealand', a large 27.5 x 21 inch chromolithograph which was printed at the Brett Printing Company at about the same time, had been "drawn on stone by W. Schmidt" and was accompanied by a key provided for the identification of the various birds. For this very elaborate multi-coloured work the artist had this time used a black key image which was printed last. Where register is imperfect, as could be seen from a close x 10 inspection, for instance of the legs of the Pied Stilt (no. 22 on the identification key), a white strip that was left for the outline can be seen.²⁶ The large size gives prints such as this a poster-like quality, while Schmidt's early flower print is reminiscent of a modern tea-towel design. The production of such prints for wide circulation was indicative of the multiplication that was leading towards the appearance of an array of other commercial print forms, such as the posters, catalogues, and other ephemeral items that together would satisfy an ever

diversifying marketplace. (See below.) For the supplement to the Christmas number of the 1901 *New Zealand Graphic*, William Schmidt had also been the chromolithographer for the large 47.5 x 76 cm. 'A Settler's Home, North Island, New Zealand', depicting an idyllic rural scene amongst native bush, with Mount Egmont in the distant background.²⁷

As found from my study of the colour printing carried out for the special numbers of the weeklies in New Zealand, the standards of such commercial prints varied greatly, as did methods of production. Towards the end of the study period three and four colour photomechanical prints were becoming more numerous. However, near the end of the period, (dated at around 1913) had come a chromolithograph produced at the Brett Printing Company from an original by the artist Fanny Osborne. The reproductive 47 x 65 cm. print 'Native Berries of New Zealand' had been ably reproduced in an elaborate style similar to that used by Schmidt from at least around the early years of the century. With fine patterning that had employed both prepared tints and stipple-style chromolithography, and with many overprinted colours used to portray the berries and drupes overflowing from a round bowl, the print is a colourful production executed in the more elaborate and complex style that was typical of the kind of commercial print for which considerable effort had been made to creditably convey an aspect of New Zealand to an awaiting marketplace. According to the artist's diary, the print may have originally been prepared for inclusion in *Brett's Christmas Annual*.²⁸

On the other hand, towards the end of the period also, the merging of the purely photomechanical with the lithographic art techniques in the attempt to make low-cost reproductive prints for the commercial market is epitomised by the print 'The Most Beautiful of All the New Zealand Fiords, Milford Sound, Otago, Showing Mitre Peak'. Looking as if it had, in Bamber Gascoigne's terms, "an advanced case of measles", this print, created for distribution with the *Auckland Weekly News* special Christmas number, had been produced around the year 1911. The crudely dotted yellow, red and blue lithographic colour, with overprinting used to give the greens, and the black dots of a half-tone from a Muir and Moodie photograph printed over the top had combined to produce an appearance of artificiality.²⁹ Although it can be seen, on close inspection, that the lithographic dots do not constitute part of a four-colour halftone, at a distance, the effect is such that it does go some way towards providing the appearance of a coloured photograph. In the New Zealand colonial marketplace at least, it could be seen that by this time, it had been the commercial chromolithograph rather than the artist's print that had triumphed, and

that by 1914 commercial colour prints of a range of standards, produced by a range of processes, and from a variety of originals were both feeding and fuelling demand.

Part 2: Maps

Colour in Antipodean Maps

Maps and Australian Colour Printing

As discussed in chapter 5, the photolithographic transfer methods that John Osborne had experimented with in Victoria from 1859 became established and spread to other states, later underpinning colour processes, and many maps were subsequently produced in Australia using the process, although, as in other fields of graphic production of the period, maps were printed using various methods, some of them experimental. Besides maps from the Geological Surveys, Lands Departments, other Government bodies, and those from the early private mapmakers such as Thomas Ham and Frederick Proeschel mentioned in chapter 4 and 5, maps came from other firms that were active in Australian map publishing at the time. In Sydney these included S.T. Leigh & Co., Lenthall Brothers; Basch & Company, James A.C. Willis, and Gibbs, Shallard & Company. S.T. Leigh, being engravers and lithographers, also carried out the printing of maps, as did the Melbourne firm of J.W. Pearson. The latter was responsible for the production of *Pearson's Australasian School Atlas* around 1867. Although this area of cartographic production was competitive at the time, and many atlases were still being printed and published overseas, Pearson's *Atlas* evidently found success in the marketplace; it was mentioned in the preface to the third 1868 edition of this local publication that two large editions had been sold in less than two months on the market.³⁰ The Melbourne firm of Whitehead & Co, also engravers and lithographers, produced Whitehead's *Atlas of Australasia* in 1871, while *The Atlas of the Settled Counties of New South Wales....* compiled by the Sydney firm of Basch and Company and published in 1874 contained the note "This atlas is the first that has ever been produced in the colony",³¹ indicative that school texts were being excluded from consideration.

As time went on, maps that were produced in Australia in the second half of the nineteenth century began to graphically represent a variety of features, including the built infrastructure networks such as railway lines and roads that were becoming more numerous. Reference to R.V. Tooley's cartobibliography *The Mapping of Australia* (1979) shows how colour was increasingly employed. An element of colour was often used to advantage to pick out such features on maps by printing them in red ink. In 1886 Garran's *Picturesque Atlas of Australasia* was published and later sold as a collection with added theme maps to show for instance, telegraph and postal services, railways and rainfall: all were included in

the volume.³² Colour in maps was by then being used in a new informational way, drawing on cartographic design principles developed in the northern hemisphere earlier in that century in which layered tints were used to visually represent data gradations.³³ An example is the map prepared under the direction of R.L.J. Ellery in the Melbourne Department of Lands & Survey entitled 'Map Shewing the Rainfall over South Eastern Australia and Tasmania for the Year 1884', in which gradations of blue were used to show areas of increasing average rainfall at a glance.³⁴ In Tasmania, cartographic printing was being undertaken locally, for instance by lithographic means at the Lands Department which produced, for example, 'Map of Tasmania 1883', which was a large scale wall map coloured according to counties, and showing much detailed information, such as roads, trigonometrical stations, and hill altitudes.³⁵ This map was brought out in several editions. An 1875 map, 'First Sketch of a Geological Map of Australia Including Tasmania ... April 1873' by R. Brough Smyth was drawn and coloured by Arthur Everett, lithographed by Richard Shepherd and printed by James Finnie and George Lusty of the Department of Mines in Victoria. For this map, colour had been used to distinguish geological features.³⁶

By the eighties, colour printing was well established in the form of chromolithography in Australia. It was in this decade that "the most important Australian atlas published in the nineteenth century",³⁷ *The New Atlas of Australia*³⁸, was produced in Sydney by the firm of John Sands, in 1886, the same year in which Garran's *Atlas* appeared. The Sands atlas included up-to-date details from the states of New South Wales, Queensland, Victoria, Western Australia, and South Australia (which included Northern Territory), with the colour printing for maps and plates achieved using the chromolithographic method. This work, in five folio volumes, contained over a hundred maps, and in addition to maps of Australia, included general world maps and maps of New Zealand, together with the descriptive geography of the states of Australia, as well as illustrations and statistics. The mapped information included much detail, with indications of "country and parish boundaries, main roads and tracks, railways built and those under construction, telegraph lines, water-holes, native wells, grazing land, forests, gold fields,"³⁹ and the routes of the Australian explorers which were listed with dates. Plates portrayed buildings and scenery in vignette form. The atlas also carried advertisements, and "a gazeteer of the towns, harbours, mountains, lakes and rivers, as well as copious indices." All combined so that the production was "a social as well as geographical record of Australia at that time."⁴⁰

In the closing decade of the century, three-colour separation printing was also becoming available, as Australian printers kept up with the northern hemisphere trends. With local

printers now able to compete with overseas productions in terms of the availability of suitable printing processes, including colour printing processes, their particular advantage of easy access to local sources of information gave an edge. The latter advantage became a considerable factor in bringing about a swing towards local publishing in the cartographic field, thus achieving market change, in that by the end of the nineteenth century local publishers had gained market dominance in the area of atlas production in Australia.

As well, the late nineteenth century trend towards greater use of maps by the general public fuelled market demand for a variety of cartographic items. Successive Government Printers catered to this demand by producing various service maps that were especially useful to tourism which, as people were gaining more mobility, had become a growth industry in the late decades of the nineteenth century.⁴¹ Robert Clancy has noted that by 1900 tourist bureaus had become prolific publishers of maps.⁴² After 1910 the need for maps and street directories that were associated with the rise of motor transport opened another market niche, an example being the now ubiquitous *Melways* of Melbourne. For all these productions, colour printing was increasingly coming into its own.

Colour Printing and New Zealand Maps to 1914

First Maps

Although European colonisation of New Zealand had called for much in the way of formal mapping activity, first to accurately chart the coastline and then to begin filling in the geological and topographic features of the interior, most of the resulting printed matter, the official charts, maps, plans, and atlases were printed elsewhere. This pattern was to continue for some classes of cartographic material right through the nineteenth and into the twentieth century, particularly for the atlas. English firms such as Wyld and Arrowsmith were responsible for many of the early printed items that documented mapped New Zealand. One famous map dating from 1852 was the Tallis map of New Zealand which originally had been produced in London for inclusion in the last of the decorative nineteenth century atlases published by John Tallis and Company. Engraved by John Rapkin, the map appeared with Maori motifs in pale brown forming the border and inset illustrations by the English artist Henry Warren that included hand-coloured views of Auckland and Wellington. This map has been reproduced many times with widely differing colour schemes over the years, one early version being published by the Auckland firm of B. Hooker around 1865.⁴³

On the other hand, by necessity, drawing of the fair copies was accomplished in New Zealand, and sometimes this resulted in early in situ printing efforts, such as those for the

first lithographic map to be produced on these shores, the 1841 Port Nicholson chart. (See chapter 4.) In 1865, the same year that Ward & Reeves had officially been recognised as introducing chromolithographic printing into New Zealand, the Geological Survey Office was established, and after this the geological mapping of New Zealand, already underway, rapidly increased.

Early Colonial Mapping Needs: Cadastral Maps and Infrastructure Network Maps

A priority in nineteenth century colonial New Zealand had been for cadastral mapping carried out in connection with the European view of the land as 'owned parcels' divided by surveyed boundaries, and as settlement proceeded, the results of land-sales, subdivisions, and town plans were so documented. For good cadastral maps a pre-requisite is that, ideally, accurate and co-ordinated land surveys should first be carried out. However, in New Zealand the co-ordination of land surveys did not become a reality until the seventies. A contributory factor was that the post of Surveyor General, which first had been established in 1840, did not last. The position had soon been dis-established because in the early political environment of provincial control it had been impossible to maintain any effective central management of surveys,⁴⁴ and in the period that followed, cadastral mapping remained under provincial control. This was a situation that inevitably led to a variety of mapping standards and uneven progress in their production.

In addition to fulfilling the need for cadastral maps, early survey work was necessary to build infrastructure such as roads, and later, railways: many maps were being produced in sheet form as part of this activity. As has been noted, many of these locally produced maps were published in the reports of the surveyor/explorers such as Haast and Dobson, while others were produced for provincial bodies. The early surveyors bore the responsibility for carrying out much of this ground-breaking work in difficult conditions. A.H. McLintock considered that "the standards, methods, and techniques in land surveying adopted in those pioneering days [were] the basis for the development of a most efficient survey and mapping organisation."⁴⁵

Updating of maps of New Zealand that had been built up in pre-European settlement times continued in the colonial era with more and more accurate data being gradually incorporated by cartographers. The resulting maps and charts, typically printed overseas, were usually pulled from the engraved copperplates by specialist map printers, and especially for the earlier ones, with any colour required being applied by hand. It is interesting that a fuller appreciation of the appearance of these older maps and charts of

New Zealand, particularly of their hand-colouring, is now possible because of twentieth century advances in colour printing. Facsimile copies can now be made in a manner that preserves the original characteristic delicacy of such colouring, and can be seen in the examples that have been published, for instance, in conjunction with Peter Maling's work on these early artifacts; in *Early Charts of New Zealand 1542-1851* (1967)⁴⁶ and in the more recent 1996 atlas *Historic Charts & Maps of New Zealand, 1642-1875*, both of which were published by A.H. & A.W. Reed as limited editions.⁴⁷

Factors Affecting Later Local Colour Printing of New Zealand Maps

Surveying Developments

By the sixties, for the production of fair copy maps and plans in New Zealand, the compass had given way to the theodolite in most districts, and by the end of that decade all but the very rugged areas of the Southern Alps and Fiordland were known, as the Geological Survey of New Zealand, begun under James Hector in 1865, progressed. By the early seventies, the use of a continuous steel band instead of the chain for distance measurement had also become almost universal. Eventually, in 1876, after provincial government was abolished, Lands and Survey was established, the government department from which the largest cartographic output has since emanated, and from which the present mapping body has descended. J.T. Thomson was initially appointed Surveyor General. These actions had resulted from recommendations made by Major H.S. Palmer, of the British Ordnance Survey, from whom the central government had requested a report. Among Palmer's recommendations were:

That a principal triangulation should be spread over the whole country, a secondary triangulation over those areas likely to be settled within twenty years, and a tertiary triangulation over all settled areas; that a uniform map projection be devised and that map sheets be compiled for record purposes; and that a test be prescribed by the Surveyor-General before surveyors could be qualified.⁴⁸

The department of Lands and Survey took principal responsibility for control of land surveys and mapping, although the rugged landscape of much of New Zealand made the task very difficult: in fact a complete topographical mapping exercise was not to be systematically tackled until much later, although much had been accomplished in the bid to map the geomorphological features and the geological systems from early exploration days onwards. Especially in the North Island, surveying had been slowed down because of the land wars and it was not until after 1900 that it was completed.⁴⁹ However, the triangulation system that was introduced in the late seventies was well under way by the nineties, and this development boosted local mapping endeavour. Since the origination of the majority of New Zealand maps was in the hands of the Government, in turn, this potentially increased

the number of maps to be printed and published by New Zealand Government agencies, and assisted standardisation of the printing methods and quality.

Government Versus Private Firm Map Printing

From the time of its the first establishment in 1867, most local New Zealand map printing was the province of the Lithographic Department, Lands and Survey, under the auspices of the Government Printer, although a small portion of this class of printing was also being undertaken by private printers, such as Ward and Reeves in Christchurch, and Lyon & Blair in Wellington who had commissions for colour printing of maps. However, as Brian Marshall has stated, for New Zealand map publication, "private enterprise has never been much more than a minor influence."⁵⁰ Reasons given by Lands and Survey cartographer D.D. McCormack for this were not only the small local market, but in general also include "the non-existence of government contracts for map production, and the tight copyright control of official mapping."⁵¹ However, just after the establishment of a lithographic branch at the GP Office in 1867, the workload in the branch was so great that private assistance had to be sought to cope with the required volume of printing: this course could not have been pursued had there not been some capacity for map printing developed by private firms.

As discussed in Chapter 5, the introduction of photolithography into the Lithographic Department by Herbert Deveril, along with the improvements that he made to the process, enabled greater efficiencies to be achieved for government map printing and laid the groundwork for future colour printing processes to be more economic. As mentioned, the Government Printer finally assumed full control of the Lithographic Branch in 1901, but until then had always supervised the map printing carried out there under the auspices of Lands and Survey. The work undertaken at the branch over this period included the lithographic printing of new maps and the correction of old ones, and was deemed to have been of a generally excellent standard.⁵²

Colour Printing Capability

Although at first the majority of the maps printed in New Zealand were in black and white, at least by the seventies colour was more commonly being applied from lithographic tint-stones. However, in the late sixties, just after the introduction of chromolithography into New Zealand, full colour-printing was occasionally being used for maps by firms able to carry it out, such as Ward & Reeves who printed the folding map alluded to for the 1866 *Haast Report* in full colour, using red, brown, green, and blue as well as black. As mentioned in chapter 9, many of the early official maps and charts of New Zealand that were initially published overseas were also printed for inclusion in published books,

periodicals and reports, as were many other locally published maps that were to be part of official records such as the Provincial Council papers and the *Appendices to the Journals of the House of Representatives (AJHR)*. For the latter, some locally produced maps that were printed in tints had appeared from the early eighteen sixties, and by 1870, fully chromolithographed maps had appeared. (See chapter 5.) Other New Zealand maps that have been included in notable printed books, for instance in David Blair's widely published *History of Australasia* as well as in other locally printed books and reports and periodicals, have been discussed in Chapter 9. For 'Wise's New Map of Otago Corrected from Official Surveys January, 1875' (39 x 44 cm.) that was typical of the eleven coloured maps presented in *Wise's Directory of New Zealand for the Years 1875-6*, outlines had been printed in black, as were the pictorial symbols denoting relief and bush areas, as well as other features such as roads, rail, rivers and towns, while major physical divisions were differentiated by the rough hand-applied colour—pink showing land areas and blue signifying the sea.⁵³ From a note that appeared with this map, it could be seen that such maps were also available as single sheets, and had been produced in other forms as well: "Copies of this map may be obtained from the publisher, Henry Wise, Dunedin. Price 3/6 each." Information in another advertisement in the volume elaborated on the forms: "Wise's New Map of Otago – Colored, 3s 6D; In Case, 6s 6D; On Rollers, 8s 6D", while also advertised was "Wise's Larger Scale Map of Otago – Colored, 21s."⁵⁴

Although it appears that there were no nineteenth century atlases produced in New Zealand, maps of New Zealand were being printed in overseas atlas productions. The 1864 *Geological and Topographical Atlas of New Zealand* by Ferdinand Hochstetter and Dr A. Peterman had been published by T. Delattre in Auckland, but the six foldout maps had been lithographed in colour overseas, some finished with hand-colouring. Acknowledgements at the bottom of the maps showed them to have been lithographed by "C. Hellfarth, Gotha". Locally, the school-book, J.J. Patterson's *A Geography of New Zealand and Australia Including Tasmania, New Guinea and the Fijis* had been published in 1884 with some coloured maps printed by Whitcombe and Tombs, as seen in chapter 9, but in fact it was not to be until around the middle of the twentieth century that the first truly national atlas was finally to appear and that cartographic colour printing was to really find its feet as a part of New Zealand's visual print culture in the local production of such an atlas. *A Descriptive Atlas of New Zealand* appeared in 1959, "in substitution for the Centennial Atlas projected in 1938 but never completed"⁵⁵ due to the second World War. That there was a ready market for such a production by then was evident: "The publication was placed on the market by

the Government Printer on 6 November 1959, the whole edition of 12,000 being sold out within a period of 24 hours.”⁵⁶ The further development of colour cartographic printing largely had to wait for the introduction of offset lithography, the process to which Frederick Sears, who worked in New Zealand as a lithographer and photographer, had contributed early in the twentieth century. For the printing of the 1959 Atlas, M.C. McRae was the overseer at the offset machine branch.⁵⁷

In the following sections, reference will be made to colour maps produced not only by New Zealand government agencies, but also by some of the private firms, but in keeping with this study, some emphasis will be laid on maps from lower North Island printers. For maps from the Wanganui printer A.D. Willis, see chapter 8.

The Artifacts: Locally Colour Printed New Zealand Maps

The Beginnings of Printed Colour—the 1860s

As discussed in chapter 9, colour was cartographically a useful means of extending the range of visual tools for symbolically depicting some map elements, and because in the colonial environment there was an immediate need for new mapping, some local printers were making an effort to facilitate local cartographic printing, especially to produce maps that were required quickly for such business purposes as land sales, such government agendas as engineering works, or to show locations of mineral deposits, for instance of the gold finds, especially as the rush to the fields gathered pace in the sixties. The pioneer Christchurch colour printers Ward and Reeves were clearly experimenting in cartographic colour printing in the early part of the decade, as can be seen from examination of some of the early printed maps from this firm that are held in the Map Collection of the Canterbury Museum. The need to depict complex geological data on maps, in order to document geological and topographical structure as a pre-requisite to ‘works’, was apparent, and the effort to facilitate communication of such data by the use of numerous colours to enable clear visual distinctions between rock systems and/or other features to be clearly shown was evident.

Colour printing, which enabled mechanisation of the addition of that colour as well as greater quality control, was to be seen as an advantage over the time-consuming hand-colouring of maps, especially when multiple copies were required. For cartographic printing in colonial New Zealand, which largely lacked the intaglio press colour traditions and the hand-colouring skills associated with Old World map production, but which possessed the lithographic press, the path to the local production of coloured maps lay in the development of planographic colour printing methods, which in any case were more suited to the

purpose, in that printing of large areas of one colour was quite often called for. But until such local lithographic means were fully developed and proved viable as a local business proposition, efficient cartographic colour printing could not become the norm, and in the meantime most New Zealand maps for which colour was required continued to be printed overseas. Numerous others that were locally produced were printed in black and white, while many others continued to be created as manuscript items only.

From examination of archival maps from the firm of Ward and Reeves, it could be seen that of the coloured maps that had been produced largely from their lithographic press, the 'Geological Sketch Map of the Province of Wellington, N.Z.' was likely to have been the result of very early attempts at colour printing by this firm, and, as far as I have been able to discover, was probably among the first local attempts to add several colours from the press for a single item. Dated by Brian Lovell-Smith as "ca 1860?" the ten shades used for this map were all juxtaposed, with each applied as an individual colour rather than resulting from any overprinting. A note at the bottom is supportive of the early date: "the interior country of the west coast has never been surveyed, and its Geography is without doubt very incorrectly laid down." Under close inspection it was observed that one colour, the olive green, which was used for only one small portion of the map, had been added by hand, while the other nine: yellow, blue, light orange, tan, grey, dark red, green, brown/grey and dotted red, had all been added from the lithographic press, albeit with some uneven application of the inks, for instance the ink had been too thinly applied in some of the larger solid areas, allowing some white to show through. This mounted 85 x 60 cm. map, published at the scale of 8 miles to the inch, documented geological formations, mountain ranges, coastal details, rivers, volcanoes, and lakes. Printed acknowledgement was given that it had been drawn "by James Coutts Crawford Esq., Provincial Geologist" and, beneath the scale, that it had been "Chromolithographed by Ward and Reeves, Christchurch, New Zealand."⁵⁸

The geological sections on this sheet (in the same colours) also showed signs that although the colour printing was at an experimental stage, quality was improving. The standard of appearance was relatively good—the register was at least on a par with the standard of some similar overseas-printed maps, for example the later 89 x 63 cm. 'Geological Sketch Map of New Zealand' that had been printed in London in 1873.⁵⁹ For the 1860s map, Ward and Reeves' colour register was sometimes out by perhaps a millimetre or so, particularly in small areas (for example the register of the colours with the corresponding black outlines of the key) although not invariably. The achievement of *consistent* register seemed to have

presented a challenge, and at the time was a problem as much associated with paper stretch as with image mis-alignment. The 1873 'Geological Sketch Map of New Zealand' which had been drawn by A. Köch in Wellington, and "lithographed and printed in colours under the supervision of E.G. Ravenstein, F.R.G.S. London" also showed a similar inaccuracy of register, although the colour printing was more complicated than that attempted by Ward and Reeves.

In the decade of the sixties, the Christchurch firm was also producing lithographic maps and sections that had been hand-coloured, for instance the sheet entitled 'Sections Across the Canterbury Plains' that was lithographed around 1864 and for which the colours yellow, green and purple grey were put on as watercolour washes over printed shading that had been achieved by the use of both black and grey inks. The original manuscript outlines (hand-coloured in blue, green and grey—differently to the lithographed version) had probably been transferred to stone by the lithographer tracing onto transfer paper, as the manuscript signature appeared in almost identical longhand on both the printed and the manuscript copies: this production pre-dated the photolithographic experiments for map printing carried out at the Government Lithographic Department in the seventies. This was one of the sections that was prepared to accompany the 1864 Haast Report: the note appeared on both maps: "to accompany the Report on the Formation of the Canterbury Plains by the Provincial Geologist."⁶⁰

Also from the sixties was a geological section drawn up to prepare for the drilling of a tunnel to connect Christchurch with its port of Lyttelton more directly than did the early route for which there had been no alternative but to go over the steep side wall of the collapsed volcano (caldera). The manuscript 'Geological Section of the Moorhouse Tunnel, through the Caldera Wall' drawn by Julius Haast in January 1867 was hand-coloured using ten different colours to distinguish the layers of rock strata depicted, reinforcing the fact that to reproduce such a sheet by colour printing, many colours, involving many printings, were needed.⁶¹ In New Zealand this effectively meant that New Zealand geological maps could not be colour printed without a chromolithographic capability. However, at that stage New Zealand colour printing was just emerging from tint to full chromolithographic technology, and was generally not as technically advanced as colour printing in the northern hemisphere. As many maps of this kind were required in the period when infrastructure was being built, this generally meant that if the creditable execution of the more demanding colour printing required for many geological maps was to be obtained, such printing could

rarely be accomplished by a local firm, few of which had the chromolithographic capability at that stage.

Thus despite the colour printing efforts of such firms as Ward and Reeves, in the eighteen sixties and beyond, many New Zealand geological maps requiring complex colour were sent overseas for printing, not only to Britain but also to Germany and Austria where advanced map printing processes had by then been introduced. An example was an 1864 'Geological Map of the Province of Nelson' by Dr Ferdinand von Hochstetter (1859) and Julius Haast (1860) that had required colour printing in thirteen colours other than black for inclusion in v. *Hochstetter's and Petermann's Geological Topographical Atlas of New Zealand*, and for which the lithographers "C. Hellfarth, Gotha" had employed printed colours that were composed from both solids and symbols, a style that was later generally in evidence in New Zealand also.⁶²

As opposed to the complex colour keys often employed to advantage in geological maps, land sale plans often made use of simple bold colour schemes for both clarity and market impact. As land was surveyed, subdivided and sold, and towns were set out, numerous cadastral maps and plans were made, a locally printed example being an 1868 'Plan of the City of Christchurch, Canterbury, N.Z.' that is illustrative of the transitional technology from manual to printed colour that was quite often being employed for short run map production at the time. For such maps, often not required in large editions, for which a simple colour scheme employing fewer colours was often both suitable and effective, some proportion of the colour work that could often be more easily and economically accomplished from the press was so added, with hand-colouring used in a complementary way.

For this map, also lithographed by Ward and Reeves, both printed colour and hand-colouring had been employed to convey several categories of information, especially concerning land selling, ownership, and leasing as it was by then. The basics of the map as well as symbols for public buildings were in printed black. Other elements chosen for colour printing were the compass points and boundaries, such as those around the sections of the city "within the limits of the 'Fire Prevention Ordinance'" and which were printed in red broken lines. Printed blue figures gave "levels at junctions of streets." In addition, land ownership categories, with a corresponding key, were indicated in six hand-applied colours. Sections that had been sold by the Provincial Government were shown in purple, those sold by the Land Office in blue, and those by the Church Trustees (the major part of the city) in

green. Church property to be let on lease was in grey, church and school reserves in tan, and college property in brown. On the tan central square, printed in black, were the words "Cathedral Foundations."

This map is not only indicative of historical matters in many spheres, but, especially through its colouring, is an attractive example of how, in print products of this category from New Zealand print culture of the time, colour was employed to help convey such information. That the printing firm made much effort with the colours is indicated by the fact that two versions of the original map are extant, (both proof copies?) each trialling a different colour scheme. The colours of the modern print that has been made of this map are similar to those in the version described above, which probably reflects the scheme eventually chosen for the original 1868 edition.⁶³ Such hand-colouring for maps and plans, sometimes in conjunction with some printed colour, remained a common map production method in New Zealand, but gradually as map printing processes advanced over the next decades, full colour printing was more in evidence.

1870-1890

The 1873 'Geological Sketch Map of New Zealand' mentioned above was printed in London with twelve distinctive key indicators composed using colour and symbol combinations all printed from the press. An example of a locally produced geological map produced in the same year, also with twelve colour key divisions to represent geological formations, but with the colour added by hand, was the 38.5 x 68 cm. 'Geological Map North East Portion, South Island.'⁶⁴ Drawn by F.W. Hutton who had been appointed to the geological survey team in 1871 to undertake much South Island mapping, especially of the East Coast and Southland, this map was representative of many of those that were produced in New Zealand at this time when local colour printing for maps was still far from the local norm. However, other examples that have survived from this period demonstrate that local printers were increasingly attempting to add colour from the press. It has already been noted that the seventies was the period in which the greatest number of maps concerning New Zealand were published in periodicals, and that the use of colour in such illustrative maps had begun to increase from this time.

The seventies was the decade when the Lithographic Department at the Government Printing Office had adopted and improved photolithographic methods for map printing, and such advances not only led to cheaper means of map printing, but also laid the groundwork for the emergence of coloured maps produced wholly or partially from photomechanical

processes. (See chapter 5.) Such developments widened the alternatives open to the later nineteenth century New Zealand printer for map production, and combination methods were evidently explored. Although many small edition maps continued to be hand-coloured, in this period a greater number were being at least partially coloured from the press, and for some, more advanced chromolithography was being used to add the colour elements required. An example from the seventies that was pointing the way for local colour printing of maps was the colour printed 81 x 57 cm. 'Sketch-map of New Zealand North Island Shewing the County Boundaries in Accordance with the Counties Act 1876' that had been "Photo-lithographed at the Gov^t Printing Office, Wellington, N Z by H. Deveril." Four basic shades of grey, pink, yellow and tan were employed for this map in addition to the black used for the text and the outlines. Some overprinting to create other colours was also evident—brown and sage green had been produced in this way.⁶⁵ A similar map was produced for the South Island.⁶⁶ From this time, many other lithographic maps were similarly colour printed by the Government Printer. Besides showing the counties and the general physical features, these productions mapped the progress of developing infrastructure networks such as towns, roads and railways, including those completed and those under construction, as did many other maps in this period, and at the same time help to document local developments in colour printing.

Occasionally, a New Zealand map publisher sent to Australia for the printing rather than to Britain. An example was a hand-coloured 89 x 71cm. 'Map of the Province of Hawke's Bay, New Zealand' that had been compiled and drawn from official sources by A. Köch and published in Wellington by Robert Burrett in 1874 "under the authority of the provincial government" in the mid-seventies, but which had been printed by "Hamel & Ferguson, Lith. 85 Queen St., Melbourne."⁶⁷ New Zealand maps continued to be printed, often overseas, in the traditional way from engraved copperplates, and examples from this era were four such plates that were found in 1982 in an old survey equipment building store in the Old Government Buildings. They had been for Augustus Köch's 16 miles to the inch 'Map of the Colony of New Zealand' that had first been published in 1876 in black and white.⁶⁸ Such maps could also be used as a basis for later photolithographed maps.

Around this time, when the Government printer was placing some surplus map printing work in the hands of private printers, Robert Burrett appears to have published a number of maps that had been first photolithographed by Herbert Deveril, including a 58 x 90 cm. hand-coloured 'Plan of the City of Wellington' produced in 1880.⁶⁹ However, the occasional but growing use of colour from the press for map and plan printing was evident in the fact

that even some private local printers were attempting such printing. Examples held in New Zealand map collections include some from other lower North island printers such as Lyon and Blair in Wellington (particularly in this period) and H.I. Jones and A.D. Willis in Wanganui, the chief market driver appearing to be official purposes, as discussed, although there were an increasing number that were being produced in colour for the private commercial concern of promoting interest in land sales. (See below.)

Lyon and Blair had tried a pictorial style for their 1879 production 'New Zealand Harbours. Patea, Plan Showing Works Recommended by Sir John Goode, in his Report Dated June 1879'. This 25 x 58 cm. map, lithographed in colours, showed envisaged 'works' superimposed on a depiction of the locality showing rivers and sea in blue, plains in green (blue over buff-yellow), grasses in brown and green, and mud and sand in a brown spatter style over yellow. The town appears in black striped blocks and the roads in yellow. The attempt to show such complexity rather obscures the informational aspect, so that in this hybrid picture/plan some of the 'works', as explained on the map itself (rather than by key) are quite difficult to pick out, especially those designated in red:

The proposed Works are shown by red colour. The works proposed by Mr. Carruthers are shown by green colour; the portion of the East breakwater for which a contract was let is tinted, and the Extensions indicated by dotted lines only. The portion of the Eastern Arm recommended by Sir John Goode in May, 1878, is shown by brown colour.⁷⁰

Such maps were borderline productions between prints and maps, this example being not far removed from the 1885 chromolithograph 'Birdseye View of Greymouth Harbour Shewing Proposed Works' discussed earlier. However, this firm was also capable of using printed colour to advantage to convey mapped information with clarity, for instance, in the ['Map of Wanganui, Rangitikei & Manawatu Showing Land in Dispute by Maoris, 1840-1882'] which was neatly printed to show outlines and relief in black, the land areas under dispute were clearly designated in salmon. This 50 x 32 cm. map, which bore the imprint "Lyon & Blair, steam litho. Wellington" was produced with a summary text as a supplement to the *New Zealand Times* for July 14th, 1882.⁷¹ Some maps continued to be published in both black and white and coloured versions, for example the Lyon and Blair plan from Wellington City Council, 'Te Aro Reclaimed Land. Plan of Leasehold Building Sections...for Sale...Dec. 13th 1889...' by T. Kennedy MacDonald that was issued in 1889 without colour, but at another printing, also in 1889, with colour added.⁷²

That the printers of Wellington, who had close proximity to the Government Printer from whom the major official local map production emanated, were not alone in an enterprising pursuit of colour printing for such print products can be seen from other examples of

privately colour-printed maps. One item produced in Wanganui by H.I. Jones was the 50 x 60 cm. 'Plan of Wanganui Compiled by Messrs. Gibbs & Pinches' that had been lithographed around 1880 in the colours red (sections that were borough property), blue (the hospital), green (industrial and school reserve), and yellow (government sections), in addition to the basic black of the outline and lettering.⁷³ Although A.D. Willis was also printing maps at this time, most colour printed examples so far traced from this firm came from a later period—in the early twentieth century.

From the list compiled by Brian Lovell-Smith entitled *Maps: A Catalogue of Historical Maps in the Canterbury Museum* (Literature Review: 29), several locally published nineteenth century maps from the mid-seventies onwards are noted as having been coloured lithographically using a process of overprinting, indicating a shift towards a more complex use of lithographic colour in this decade. Of these, two mounted maps that were printed around 1875 documented infrastructure, both entitled 'Canterbury Central' – one shows road districts and the other railways. The printers names have not been given on either of these maps. Slightly later, a mounted map from around 1880, of 'Selwyn County, Western Part' was similarly produced by lithographic overprinting of tinted colour by the Christchurch firm of J.T. Smith & Company. In 1884 the railway map, 'Middle Island...Various Routes for East & West Coast Railways' had also been colour printed in a similar way.⁷⁴

Lithographed by the Christchurch "Press Company, Limited", a large colour printed 150 x 120 cm. mounted wall map with a roller and hanger was an example in which colour had been used boldly in large areas to assist cartographic conveyance of a wealth of information concerning the configuration of 'Christchurch Canterbury, 1877' as it was by that time.⁷⁵ For instance, green areas delineated such features as the Christchurch squares and Hagley Park, pale orange the streets, and blue the rivers and sea. Figures and some text stood out in red, while outlines as well as buildings were printed in black, the latter with a key for identification. For this particular production, which had been "compiled by T.S. Lambert" from data supplied to the City Council and the Drainage Board, the colours were each discreet and had not been formed by overprinting. This could be ascertained where the register was rather approximate: white rather than yellow showed beneath the green as would have been expected if it had been formed by printing blue over yellow, the latter a method that was observed to be a more common occurrence in later periods. A slightly later example of a similar map, the 32 x 29 cm. 'Plan of Christchurch and Suburbs' that came

from the "Lyttelton Times, Steam Lith." was printed in five lithographic colours other than black.⁷⁶

Throughout the eighteen eighties maps that had at least some colour from the press continued to emanate from the private printers in all the main centres. The 125 x 145 cm. 'Map of Selwyn County, Western Part', from J.T. Smith and Company, which was both topographical and cadastral, was printed with colours used for both solids and line symbols. For instance county boundaries were shown in dull red broken lines, run boundaries in unbroken red lines and road district boundaries in broken green lines, while other features were denoted in solids, for instance, reserves were in pink and braided rivers were shown in both light and dark blue, to distinguish the habitually flowing channels from the river gravels. In this case, overprinting occurred, for instance where a coloured boundary line was printed over a solid area. The companion sheet, 'Selwyn County, Eastern Part', was similarly printed, but without overprinting, although the poor condition of this map makes it difficult to distinguish colours. Some hand-colouring appeared to have been added, perhaps at a later stage for update purposes. A spatter style of lithography was used to achieve a three dimensional effect for areas of relief in both these sheets which together covered the area of the Upper Waimakariri and Lake Coleridge. "J.T. Smith & Co. Liths, Christchurch" appeared in both maps under the scale.⁷⁷ The spatter style to depict relief employed by Ward & Reeves earlier had continued in use: the same style being seen also in a later 60 x 100 cm. eighties wall map acknowledged under the scale to have been produced by "Whitcombe & Tombs. Lim., Lith., Christchurch, NZ" in 1887. This 'Map of the Provincial District of Canterbury' was printed in black, while colours, some added by hand, denoted provincial districts (three different colours), with blue used (in addition to the indication of water areas) to print some names. Register was rather inaccurate in this map and in some areas caused a doubling effect. However, when viewed at a distance on the wall this would not have been as noticeable.⁷⁸

With simple areas of juxtaposed colour clearly designating separate features, the map 'Auckland Harbour' had been compiled and drawn by H.N. Warner and lithographed by Wilson and Horton for the Auckland Harbour Board probably in about 1881, as the note "D.E.M. Donalds Auckland Engineer Sept. 1881" can be seen to have been added over a portion of a coloured area. In four colours plus black, the map is an early example of colour printing from this firm. In the main map the sea has been shown in blue, following black lines tracing the shoreline in an isometric fashion, and in a solid blue in the inset map that shows the entrances to the harbour. Pale yellow has been chosen for land, pink for

unencumbered harbour endowments, and areas secured under the Auckland Harbour Act 1874 have been tinted green.⁷⁹ (Plate 51.) A colour printed map from the eighties bore “Coulls, Culling & Co., October 1889. Lithographers, Printers &c., Dunedin,” at the bottom, as well as the name of the lithographer: “Alfred Jarman, Litho.” In black and three other main colours, the 92 x 72 cm. map, finished with a glaze, contained much detail but nonetheless was visually clear. However, such maps from private firms were in a very small minority compared with those printed under the authority of the Government Printer.

Official Maps

Government body map publishers active in nineteenth century New Zealand included the N.Z. Department of Lands and Survey, the N.Z. General Survey Department, the N.Z. General Survey Office, the N.Z. Geological Survey Office, the N.Z. Government Printing Office, the N. Z. Government Railways, the N.Z. Mines Department, the N.Z. Public Works Department, and the N.Z. Survey Department.⁸⁰ From the early seventies, the Lithographic Branch at the Government Printing Office had accomplished the printing for many Government departments, and by 1897, these numbered fourteen.⁸¹ From the first years of settlement, maps had been printed under government auspices, the task being greatly facilitated by the arrival of Herbert Deveril. By 1876, a report from Deveril that George Didsbury sent to the Minister of Public Works commented on the success of the photolithographic process he had introduced to increase efficiency, and which by then was being used as a basis for colour printing. He said that it enabled the printing of numerous:

maps, plans and drawings, however elaborate, in a remarkably short space of time...of reducing those plans to any scale that may be desired; it saves draughtsman's labour, by enabling maps and plans to be cut up and mounted for photographing; it affords the means of procuring facsimiles of original documents...⁸²

From the inspection of maps during this study, it could be seen that by the eighties, many published in colour by the General Survey Office in Wellington and printed at the Lithographic Branch were very clear and well printed. For instance, the ‘Map of the North Island’ that was dated by the Survey Office at “July 1881” had been printed with two colours from the press to enliven the black of the basic map—a pale aqua background and a deeper aqua in isometric lines to emphasise the coast; used also to pick out other bodies of water, such as lakes, sounds and estuaries, and with shaded relief, roads, rivers, textual elements, railways, towns and boundaries in black. This restrained colour presentation

Plate 51: ‘Auckland Harbour.’ Map: 52 x 85 cm. Scale: [ca. 1:14 500].

Compiled and drawn by H.N. Warner, lithographed by Wilson and Horton ca. 1881.

Published by the Auckland Harbour Board ca 1881.

By permission of the Alexander Turnbull Library, Wellington, N.Z., Cartographic Collection.

Ref. No.: MapColl 832.12aj/1881/ Acc.22902.

appeared as a pleasing whole.⁸³ In the same year, the land tenure map of the North Island had been “photolithographed at the General Survey Office”, along with a map of ‘Middle Island’, both produced to accompany the *Crown Lands Guide*, 1882 no. 3.⁸⁴ Here colour printing was used to convey information effectively. The basic colours of black, yellow, blue and salmon were combined with symbols such as stripes and dots to create eight separate visual colour segregations in the key to convey land status clearly, for instance, “Lands already Passed from the Crown”, or “Lands for Sale on Immediate Payment.” An update of the Middle Island map issued the following year published as a sheet and contained in a wallet for which the end papers had also been attractively colour printed had been owned by Julius Vogel.⁸⁵ On this 54 x 39 cm. map colour printing was again confined to the background and shoreline. Updates of the land tenure maps continued to appear in the *Crown Lands Guide*. Maps were for sale from the Government Printer: an advertisement for “Maps of New Zealand North and South Islands. Royal. 2s. 6d. per pair” appeared in a List of Government Publications for sale in the 1889 publication from the GP Office, *Tourists’ Guide Book to the Lakes District of Otago*.⁸⁶

In the later eighties, colour-printed maps reflecting further infrastructure, such as those detailing the development of railways, and others reflecting such budding industries as tourism were appearing from the government printer, sometimes in a pictorial style. An example was a photolithographed ‘Middle Island Sketch Plan of the Various Routes for the East and West Coast Railway’⁸⁷ with line colour overprinted to make salient information stand out to the eye. Topography was shown in hatched relief, the coastline in the by then usual blue isometric lines, while three different symbols in black distinguished “railways made”, “railways in progress”, and “railways authorized”. Yellow showed the “Cannibal gorge route”, blue the “Hurunui gorge route”, red signified the “Waimakariri gorge route” and green the “Lake Lyndon route” in Arthur’s Pass. Such a map recalls and emphasises the fact that to construct works like railways and roads in nineteenth century New Zealand, enormous problems presented by the difficult terrain had to be overcome from the stage of the early surveys, right through to the completion of the task. Good maps and plans were vital for such works to be successfully undertaken, and colour printing was increasingly being employed as an informational tool in this enterprise.

In this decade, when much detail was being added to existing maps and others were being adapted to suit diverse informational purposes, in the quest for a greater facility of presentation, overprinting using combinations of colours and symbols was being further explored to extend the visual possibilities of map keys. For the 56 x 41 cm. map of a region

of great interest to tourists, 'The Central Thermal Springs Country, North Island, N.Z.', produced by photolithography in 1888 and published by the General Survey Office, an essentially pictorial presentation had been chosen. In this case the basic map was printed in black and colour overprinting used, for instance, to show areas of forest in a sage green. This was achieved by applying a prepared cross-hatched pale orange tint over the top of a solid blue, while bridle tracks and "roads suitable for wheeled traffic" were shown via a symbol combined with pale orange. Bodies of water such as Lake Taupo were printed in a fine blue stripe, with the shore picked out in a solid blue. The order of printing was able to be ascertained where inaccurate register allowed analysis.

1890-1914

This was the era in which colour was being regularly employed as a marketing tool for the special numbers of the weekly newspapers. Sheet maps, sometimes produced as supplements for this genre were another form of print product with which printers achieved greater diversification in the bid to target a wider market. (See chapter 10.) Many maps from this period continued to graphically update transport developments, for instance, as they tracked the advance of roading, railways, and tramways, as well as following the growth of towns and cities. Such mapping reflected the colonial cultural concern with the building and extension of the infrastructure inherited from a European way of life. Subject matter for maps began to be more diverse as time went on, many reflecting cultural trends, purposes and directions of interest. For instance, alongside the major thrust to further document internal affairs in the maps being made, more maps were being produced for a developing tourist trade, and others reflected an increasing awareness of New Zealand's geographical position in the South Pacific and growing trade links with that region.

However, in New Zealand, a main factor in the marketplace of maps was that the government continued to be the major printer and publisher of this class of print product to the end of the period under study, including maps that were printed in colours. Even so, a private printer with the ability to print colour maps could accept printing commissions from official publishers, as well as publishing others under the firm's name. Thus, as was evident from extant examples, in addition to officially produced maps, a smattering of others from private firms continued to appear, at least in the main centres. For instance a sheet map from this era that had been printed in Wellington was the undated 41 x 25 cm. 'Map of the Southern End of the North Island of Cook Strait' lithographed in a simple colour scheme by McKee and Co.⁸⁸ This was an essentially black key map overprinted with blue to demarcate the coastline, and with pale orange showing areas of informational interest: in this case

areas depicting Maori land blocks on the West Coast of the North Island between Wellington and Wanganui.⁸⁹ Other colour printed maps came from such private printers as the Lyttelton Times Company, Whitcombe and Tombs, and Smith and Anthony in Christchurch, while Wilson & Horton in Auckland and A.D. Willis in Wanganui were others who were producing locally printed colour maps during the early years of the twentieth century.

Many printers throughout the country were responsible for printing the local land sale plans that constituted a large class of print products. Obviously printed to fulfil an advertising function, these and other maps that were akin to posters were becoming more common as the colour element could also be seen to have had a decorative purpose, and such items were for this reason, as well as for their informational value, sometimes hung on walls. One map which explicitly bore the words "Please Hang in a Conspicuous Place for Future Reference" rather than using colour to advertise land for sale, was publicising a canal proposed for the Avon River Estuary. Produced by the S.T.C. Advertising Agency with the title 'Birds Eye View of the Proposed Christchurch Canal', the colour printing for the 4000 copies of the 58 x 96 cm. map, executed by the Lyttelton Times Company in February 1906, was based on a combination of red-brown and blue produced from prepared tints and solids, colours that were also used for the textual elements. Bearing advertisements as well, this decorative advertising map from 1906 was a composition for which trouble had been taken with design and colour—perhaps in the belief that pleasing the eye would be motivation enough to obey the marketer's instruction.⁹⁰

For another privately produced map, lithographed in 1911 by the firm of Whitcombe and Tombs in Christchurch, effective use had been made of mainly lineal colour to both emphasise and distinguish between informational elements such as provincial boundaries (in yellow), county boundaries (in blue), road district boundaries (in green) and principal roads (in red). Symbols used in conjunction with the colours, and other mapped elements such as relief, "constructed railways", "pastoral homesteads", boroughs and townships were all printed in black. Thought by its cataloguer Brian Lovell-Smith to be a copy of a map originally published in 1887 by the same firm, this update was entitled 'Map of Canterbury Compiled from the Latest Government Surveys'.⁹¹ A colour printed map from the northern firm Wilson & Horton, 'Visitor's Guide, Town of Rotorua', was a sign of its times not only culturally because of the shift in emphasis to information now being provided specifically with the tourist in mind, but also from the mode of its colour printing. Although quite roughly lithographed, the colour printing for this 1910 map had been based on the primary

colours which were used with both symbols and overprinting to economically expand the graphic possibility range.⁹²

A later production that had been lithographed in colour around 1914 by Smith and Anthony, was the 'Road Map of the Province of Canterbury, New Zealand'. Marked "copyright", it had been published with assistance from the Canterbury Automobile Association "who subsidised the work, and under whose direction this map [had] been prepared, checked and published." Although the register was poor, it is interesting for the information conveyed on it regarding road travel from the time, often information that was highlighted in colour. For this item, orange was chosen to print the main routes and the usual blue used for water bodies. Symbolic letters in red boldly indicated boarding houses and other accommodation such as hotels, as well as garages and bridges. The latter was of concern to the motorist because at the time much bridge construction was still in progress. A note on this map informed the reader that "the speed limit is strictly enforced on Ashburton Bridge" and that "the Coastal Route to Kaikoura from Christchurch is more suitable for motorists, as the rivers are all bridged, with the single exception of the Conway, which is about to be bridged."⁹³

By this time maps that required relatively large areas of colour were commonly printed using prepared tints. For a 72 x 50 cm. 'Map of Christchurch and Suburbs', this technique had been used—colour in prepared designs was printed over solids to designate areas variously, for instance, counties, boroughs, city centre, sea, river estuaries and lakes. Thus, from a small number of elements, both colours and patterns, the key had been easily extended by means of overprinting. For instance, extra colours were formed by printing pink over blue to give lilac and over yellow to give salmon, each of which could also be used printed over a symbol to increase the graphic range, by then a standard way of printing colour on maps. This example, again from "Smith & Anthony, Ltd., Photo-Litho. Christchurch", was an updated map that had been "revised Jan 1, 1914." Some of the added colour had been applied by hand.⁹⁴ Many of the maps produced over the years by this firm had been the work of Edgar Macleod Lovell-Smith, a lithographic draughtsman and artist who had studied locally at the Canterbury College School of Art, gaining his certificate in 1895.⁹⁵ 'Map of Christchurch Shewing Tram Routes & Public Buildings', produced for the Christchurch Press Company, had been printed using a similar technique and published by Phineas Selig in 1912 with surrounding advertisements. The maps that were occasionally included as colour supplements with the special numbers of the weekly newspapers were

sometimes in the form of large foldout sheets such as this 3' x 2' 6 production, which was probably printed for the purpose.⁹⁶ (See also chapter 10.)

Maps from the Government Printer

After the lean times of the eighties, when economies were necessary at the GP Office and instructions had been given to avoid work “of a clearly unprofitable nature,”⁹⁷ a period of expansion ensued. The move to new premises had occurred in 1888, and by early years of the new century technological progress was proceeding apace, although the photo-offset methods that were to be especially suited to map printing were not in place until after the study period. This was the era following the fire at the Government Printing Office that had caused the loss of many of the lithographic stones previously used for map printing, but by then photolithography was well underway, a process that enabled re-transfers to be easily made from already printed items. It could be seen from maps printed for the Department of Lands and Survey from these decades that many had been produced by photolithographic means. Where typically two or three printed colours were employed in addition to the basic photolithographed black map, colours had often been combined with prepared tints to extend graphic possibilities in an economic way, although this technique was not invariably the option used. Hand-colouring was also still in evidence, for instance used on a map entitled ‘Taranaki’ that had been printed around 1894, for which the coloured lettering and riding boundaries had been rather unevenly applied.⁹⁸ Sometimes a little colour had been introduced in the form of one or two letterpress colours. In other cases, a lithographed map appeared that had been printed using solid colours only, for instance, the 1894 photolithographed map ‘[European Colonies in the South Pacific]’⁹⁹ that had been printed in the solid colours red, blue, yellow, green and brown. Another example from around the middle of the decade was a map in which the simply printed colour scheme was in two solids—pink chosen for the area occupied by Australasia and pale blue for the ocean, upon which the subject of the map, the ‘Suggested Pacific Island Trade Routes’ were clearly indicated in printed red.¹⁰⁰

The 1897 ‘Map of New Zealand: Shewing Railways Open for Traffic’, epitomised the colour style that was in effect for many colour printed government maps by the end of the century. For this map, a 58 x 42 cm. item that had been lithographed at the Head Office of Lands and Survey by H.E. Taylor, a simple scheme of blue, black and red had been used. The background sea was in a finely striped blue, other water bodies in solid blue, while the railways appeared prominently in red: a solid line to indicate government railways and a broken line to denote private lines.¹⁰¹ Other maps were similarly prepared in the following

years, often using mechanical tints in combination with colours to graphically document a range of spatial matters, for instance flood localities in river drainage areas, land reclaimed from the sea, further land transactions, forested areas, electoral districts, and features of interest located in popular tourist areas. As well, further geological and topographical information continued to be printed on maps—either for update purposes or for areas being newly mapped.

This was the period in which John Mackay's name appeared on many maps as Government Printer, after his appointment in 1896. W.A. Glue has commented on the GP Office in the period before the first World War:

Under Mackay's direction the Department was welded into a fully equipped and efficient unit. Modern machinery tripled its production figures; improvements in organisation reduced delays. More staff were engaged to speed the flow of work...¹⁰²

As Chief Draughtsman, F.W. Flanagan was also named on many a map printed at the GP Office in this era, for example on the 1899 'Map-to-accompany-a-return Shewing Lands Reclaimed from the Harbour of Port Nicholson', an 85 x 62 cm. sheet that had been photolithographically prepared around the turn of the century for Land and Survey. For this map, eighteen separate legend designations had been created from basic yellow, green, red and blue tints by an overprinting technique. For instance a finely striped blue was cross-hatched over a finely striped red to give purple. A small aberration in the purple printing on this map had occurred where the red and blue were incorrectly aligned in the same direction. By causing a pooling of colour the error slightly detracted from the overall evenness of tone; otherwise the standard of printing was high. This was a map in which colour had been used as an effective tool to present much information with clarity.¹⁰³ (Plate 52.)

Also produced in colour under John McKay was a poster-like map showing the route of the famous Milford Track over the McKinnon Pass which had appeared with the words "Issued by the New Zealand Government Department of Tourist and Health Resorts" printed at the top. This 42 x 31 cm. item, entitled 'New Zealand, Te Anau Lake to Milford Sound' had been lithographed in 1904 in pictorial form in black, brown, red and blue for the tourist market. A design of *Ranunculus lyalli* in brown occupied a circular space, and relief had

Plate 52: 'Map-to-accompany-a-return Shewing Lands Reclaimed from the Harbour of Port Nicholson.'
Map: 85 x 62 cm. Scale: ca. 1:3960. F.W. Flanagan Chief Draughtsman, lithographed at the Government Printing Office.

Published by the Dept. of Land & Survey, Wellington, 1899.

By permission of the Alexander Turnbull Library, Wellington, N.Z., Cartographic Collection.

Ref. No.: MapColl832.47799gmfs/1899/Acc.23517.

been printed in the same colour in a pictorial manner. Black had been used for the border, the textual elements, and an inset detailing distances from hut to hut, while the sea and sounds were in printed blue. The route of the Milford Track and the words 'New Zealand' attracted the attention in red.¹⁰⁴ Examples of colour printed maps from the second decade of the century in which the simplicity of the printed colour acted as an effective visual tool were those comprising a series that was published by the Government in 1914 to detail kauri gum reserves as at 20th March of that year. One of these maps, typical of the set, was the 27 x 30 cm. 'Eastern Part of Whangarei County' in which red on a basic black and white map delineated borders in a solid line, and, at the same time, clearly differentiated gum areas at a glance by means of a red stripe pattern.¹⁰⁵ In such cases, clever employment of design balanced the economy of the colour-printing style.

The production of such topical maps was underpinned by the ongoing official geological and some topographical mapping, as were the land sale plans that accompanied the systematic subdivision of land into parcels for continuing settlement, an example being the 1908 'Geological Survey Map of Mid-Wakatipu (sic) Survey District' drawn by G.E. Harris in July of that year. This map, printed in colour "to accompany Bulletin no 7, Queenstown Subdivision, Western Otago Division," had also been lithographed in the colour plus pattern style, this time using as a basis the primary colours red, blue and yellow.¹⁰⁶ Dating from around the beginning of the second decade of the twentieth century, an example of a new topographical map that had been "compiled from data obtained for the Lands and Survey Department and additional surveys by K.M. Graham" was the 'Topographical Map of Tairua Survey District'. For this 34 x 35 cm. sheet, also compiled and drawn by G.E. Harris, a simple, clear colour scheme was employed, using a brown spatter style to show relief—with the ridges left white and dot density used to give an impression of the relative steepness of slopes. Bush areas were indicated in green, the coastline in blue, while the rest of the map, including the dendritic drainage pattern, was in black. It was printed "to accompany Bulletin no. 15, Waihi-Tairua Subdivision, Hauraki Division, Auckland Land District"¹⁰⁷: geomorphological information such as that given in this sheet was vital to any prudent subdivision plan. However, many such large scale topographic maps were not in printed form, and until the 1930s such mapping was not undertaken systematically. P.L. Barton has commented that in fact:

Surveying in New Zealand until the 1930s was essentially geared to providing land (with title) for settlement or for public works and map production was mainly in the form of sale or cadastral maps. Though maps of the whole of New Zealand were published showing the topography, little large scale topographic mapping was published except for military purposes during the First World War. Topographic plans were drawn by surveyors and exist in manuscript form but as there was no requirement they were not published. The advent

of aerial photography and adequate funding in the mid 1930s meant that large-scale topographic mapping of the country could seriously begin.¹⁰⁸

Land Sale Plans

After European settlement, the New Zealand economy had been built on the concept of living off the land, with the primary industry such as farming, mining, and a little later, tourism generating much of the wealth. Land for settlement had been the priority for survey work, and from that time onwards, the landscape had been mapped accordingly. Numerous cadastral maps continued to be produced throughout the period under study and over this time a growing number were colour printed, many by one of the private firms, although others were executed from official sources.

From extant cadastral and sale plan maps from Wellington colour printers of this period, it is evident that several printers had employed colour printing to produce such items in that city alone. Often in a poster style, colour in such plans tended to be used to catch the eye, while at the same time clearly delineating the land for sale. Similar subdivision and land sale plans were also being produced in other parts of the country. An example from Christchurch in this period was the very colourful poster-like sale plan 'The Grange. Opawa' lithographed in colour by the Christchurch Press Company in the nineties to show 49 lots for sale. These were shown in brown, blue, yellow, orange, green and salmon within the contrasting black of the survey lines, with dimensions and areas (in acres, roods and perches), street names and descriptive text also printed in black. The agent was named as Allan Hopkins, and the surveying firm as Hanmer and Bridge. For this item, three of the colours had been produced by overprinting: blue over yellow to form green, blue over orange to produce brown, and salmon over yellow to give the orange. In addition, scenes of the area were portrayed in stipple style chromolithography within collaged vignettes, and in the top right hand corner was a locality plan printed in black, blue and salmon; the whole having a pictorial illustrative character.¹⁰⁹ The Press Company continued to produce such colour printed sale plans beyond the end of the period of study. Another example, from 1906, was a 57 x 78 cm. sheet printed in five colours. It showed the subdivision of the mid-Canterbury R.S. 17616 – the Property of James Quigley that was to be sold by public auction by Friedlander Bros. of Ashburton.¹¹⁰ A later example, a 1912 plan advertising 18 lots for sale in the Papanui and Normans Road area of Christchurch, had been lithographed in a simple scheme of green for the lots, pale orange for the roads and black for all other elements. Although the name of the printer was not stated on this sheet, in other respects it appeared typical of many such colour printed plans of the time.

Wellington

Although the original town plan for Wellington had been drawn up in England, surprisingly, without reference to the contour of the land, by the nineties much local topographical information was known and mapped, and this formed a sound basis for further land subdivision in this part of the country. However, printed land sale plans, often in an advertising mode, typically focussed on the commercial aspect and hence simply defined the sections of land available for sale. As well as the Department of Lands and Survey, the several Wellington printers who were producing such land sale plans in colour in Wellington included, from the nineties onwards, Lyon & Blair, McKee and Co., Ferguson and Hicks, the New Zealand Times Company and Whitcombe and Tombs. Most of these items, a number of which had been prepared for areas outside Wellington, often in other lower North Island towns, had been printed in two or three colours plus black. A minority were in one colour in addition to black, for instance the neat 48 x 61cm. sheet in red and black publicising 'Sections Open for Sale in the Celebrated Oroua Downs Estate, Manawatu', in which the 17,000 acre subdivision was printed in a red stripe tint by Lyon & Blair around 1892.¹¹¹

Emphasising the advertising intent was the 46 x 72 cm. plan 'Great Land Sale at Fielding, Saturday, 5th November, 1898' which bore the instruction at the top in red: "Please put this in the most conspicuous place you can." Against the black of the background textual information and basic plan, the lots for sale had been printed in glowing orange, with patches of bush in green, the river in aqua, and roads in a paler orange. Lot numbers were in red, the colour that had also been used to overprint in dots the pale orange of the lots for sale to give that orange glow.¹¹² The printers were McKee & Co. who had also produced 'New Brighton, Christchurch, Building Allotments' a 56 x 94 cm. plan of 1899 that clearly set out the allotments for sale in the centre, using the warm colours yellow, pink and salmon (pink over yellow). For this plan, an added feature in each corner was a half-tone image as yet in black and white, but chosen to reflect desirable aspects of the locality, for instance to emphasise the proximity to the "New Brighton Pier."¹¹³ The fact that McKee & Co. were by then known as specialists in such image printing may provide the reason for the firm being given such a job, one that may otherwise have gone to a Christchurch printer.

An 1898 plan of a slightly different variety that documented land that had been acquired in exchange with the Crown was colour printed in a similar style to other maps appearing from the GP Office at the time. It was the 40 x 36 cm. 'Map Shewing the Hororata Estate, As Acquired from the Crown' that had been photolithographed at the Head Office, Department

of Lands and Survey in August 1898, and for which F.W. Flanagan was named as Chief Draughtsman. With an extensive colour scheme achieved in the by then usual overprinting of a combination of solids and patterns onto a photolithographed basic map, this item contained no less than sixteen distinct colour categories used to demarcate the blocks, for instance in green solid (blue over yellow), blue bordered, blue dot, blue stripe, blue cross-hatch, and so on, using the basic colours blue, yellow, and pink. Some inadvertent colour mixing occurred in the overprinting process, as a slight mis-register had led to the appearance for instance, of unwanted brown between green and orange.¹¹⁴

On the other hand, an item produced at around the same time, the 'Plan of Subdivision of Section 5 Crofton to be Sold by Auction by Messrs. J.H. Bethune & Co., on Monday 4th December, 1899', was a simply lithographed land sale plan produced in black and pale orange. W.R. Bock was acknowledged as the draughtsman and "Whitcombe and Tombs Limited" appeared at the bottom of this commercially printed Wellington item.¹¹⁵ In the early years of the twentieth century, colour printed land sale plans in the pictorial poster style appeared to be more frequent, such as the November 1905 'Plan of Sixty-six Splendid Seaside Sections...' which was lithographed in four solid colours by the New Zealand Times Company as a large bold production in which black, green, yellow and blue decorative lettering was employed.¹¹⁶ From the following year was the 'Plan of the Lowry Bay Estate'¹¹⁷ that had been lithographed in black, pale orange and blue/green by Ferguson and Hicks of Lambton Quay, Wellington.¹¹⁸ Such items were also indicative of the fact that by then many now well-known Wellington residential localities were being opened up. The Lowry Bay plan gave an immediate visual impact as it advertised "103 ideal seaside sections to be sold by Public Auction on Wednesday, Dec.5th, 1906 at 2.30p.m. by William H. Turnbull and Co..." and was but one of many such items coming from Wellington colour printers in the period. Other land advertised on a Wellington-printed plan was located in the Wairarapa, for instance an estate on the east coast that was advertised for sale at an auction to be held on 15th January 1908 on the colour 'Sale Plan of the Famous Maraihangā (Akitio) Estate' which had been produced in black, green, blue, orange and brownish-green. At the bottom right-hand corner of this item appeared "'Litho. by Whitcombe and Tombs Limited, 74919.'" Because of a slight misregister, it can be seen that the black impression was the last printed. Red ink had been used to correct a mistake in acreage.¹¹⁹

The combination of the pictorial with the cadastral in these land sale plans, as well as their poster-like style and function, puts such items in a group that lies somewhere between

maps and posters, the latter being a class of print products for which colour printing often came into its own, and which will be discussed in the following section, along with a diversity of other ephemeral items that make up the final class of print products from New Zealand colour printers to be examined.

Part 3: Ephemera

The Antipodes

Just before the diffusion of the chromolithographic form of colour printing to the New Zealand colony, it had been demonstrated that colour printed items of many kinds could by that time be produced in Australia, for instance by Johann Nepomuk Degotardi, the Sydney printer, engraver, lithographer and (from around 1868), photographer. Specimens of colour printed items intended for everyday use have survived as part of his 1861 publication *The Art of Printing in its Various Branches: with Specimens and Illustrations*, which itself was originally published in bright green coated paper wrappers (outside only) that were printed in gold. (See chapter 4.) By their very nature, the vast majority of such ephemeral items have disappeared, but the fact that some have survived in a volume such as this one, and others because they have been preserved in archives, affords the researcher evidence of the kinds of sundry items that were produced, some colour-printed, as a result of jobbing work accomplished in colonial printeries such as as Degotardi's Sydney Printing House. From specimens in the *The Art of Printing*, it can be seen how some printing processes, including colour printing by chromolithography, were in use for the production of everyday print products in Australia, just before the time that colour printers are known to have begun applying colour from the press to similar items in the neighbouring New Zealand colony. The title-page of *The Art of Printing*, itself an example of how colour was occasionally being used in letterpress printing in Australia in the eighteen sixties, suggests how colour could have been employed at the time by jobbing printers to enhance, perhaps a programme, card or label, or to draw attention to an announcement on a printed poster. Described by Jürgen P. Wegner at the time of the production of the black and white facsimile edition of *The Art of Printing* in 1982, the title-page for the original work, was:

Printed in a variety of typefaces and coloured inks – borders in blue; lines 2, 7 and 9 in red; 4 and 8 in green. Printed on a lightweight highly calendared laid paper...it was a single tipped-in leaf with the verso blank.¹²⁰

As mentioned in chapter 4, examples presented in *The Art of Printing* had included a copper-engraved bill-head, engraved visiting cards, an engraved music score and a lithographic circular. The finely printed wine label had been chromolithographed in gold, green and black.¹²¹ Such examples, although primarily produced as a way of advertising the printers' capabilities to the market, would also have acted as a spur to other printers by

suggesting ways in which colour could be used to advantage for smaller items without entailing a large financial outlay. As well, through their everyday use, such practical items as those that emanated from this firm themselves acted as a means by which the diffusion of ideas for the employment of printing methods occurred. Many such printed items moved with residents and travellers in the course of their activities, whether for business, social, entertainment or just general living purposes. It was not only the more substantial deliberately ordered and imported books and periodicals that arrived from elsewhere and that subsequently moved within the Australasian colonies, but also many such ephemeral items that, often inadvertently, were moved around. Some of these print products, for instance, stamps and cards, were deliberately sent. Such print products could carry with them contemporary notions of how known colour processes could be applied to the production of inherited forms of print products, for example, to labels or to cards. On the other hand, where the content, for instance, of a poster for a local event, was for local consumption only, this did not preclude its being printed overseas. Such items would therefore also have assisted in the circulation of printers' ideas for ways to effectively employ jobbing colour. In addition, trade magazines, for instance the *British Printer*, the *Penrose Annual* and *Typo* often described and/or published printed examples, both those considered to be of a high standard and worthy of emulation, and those from a variety of countries that were intended to demonstrate the capabilities of printers who contributed samples of their work. As time went on, colour was increasingly used to print such ephemeral items. Of Australian trends it has been said that:

In the new [20th] century, Australians bought more luxuries and manufacturers sought to present them more attractively. Illustrations and colour on labels replaced words in black and white. Printing and packaging became inseparable and the packaging industry boomed.¹²²

New Zealand

Commercial Job Printing and Colour

As the population of nineteenth century New Zealand grew, accordingly the demand for general printing of all kinds increased. In New Zealand where most printing was done in the four main centres, and early job printing was usually associated with a newspaper office, especially in the period up until the eighteen nineties, printers dedicated to job printing alone were not commonly found in the regions. Peter Hughes has found that to 1889 in New Zealand,

three in five pamphlets in the smaller centres were produced by newspaper offices, but only one in five in the main centres. The relatively high figures from the small centres may be explained by reference to the colonial Australian scene, where 'the availability of newspaper presses with spare capacity was crucial to the new industry...[and] the imprints of many pamphlets and other ephemeral products tell this story without ambiguity'. It is likely that smaller centres produced smaller-sized papers less frequently and therefore had more time to undertake additional jobbing work, as suggested by Kirsop. There was also less jobbing work to do and the evidence suggests that in the smaller centres the independent jobbing printer was a rare breed.¹²³

As well, R.A. McKay pointed out, as these newspaper/jobbing offices were uneconomic units in many cases, there was a high rate of mortality.¹²⁴ Job printing carried out by such firms included the printing of forms, letterheads and other business items for commercial use, tickets and timetables for transportation purposes, paper money, posters, bills, brochures, post-cards and all manner of publicity and advertising matter. For economic reasons and because only basic supplies were to hand, in the early years of European settlement in New Zealand most of this class of printing did not run to more than black and white, but by the seventies, effective use of colour was in evidence, especially for posters, although, for this genre of ephemeral items, at first colour was introduced mostly as a substrate for letterpress printing in black ink. Such a ploy was also used to produce such items as tickets and timetables, for example, for the first New Zealand coastal steamship, the *Wonga Wonga*, for which tickets were printed in black on a blue ground.¹²⁵ The use of red ink, another time-honoured economical and effective way of adding efficacious colour to a print product, was also put to work, an example being the separately printed number on the early colonial five trip tickets which linked up with the tramways accounting system and that was printed in red ink to stand out. A further use of such simply applied colour was for the purpose of attracting the eye, examples being the printed advertisements that sometimes appeared on such items as timetables and programmes,¹²⁶ where such colour not only highlighted the printed message, but at the same time earned revenue to reduce production costs.

In such simple ways, colour was being introduced to the colonial marketplace of print in a variety of everyday items, and by the end of the nineteenth century, for many of these items the colour had become more elaborate. Part of the market for colour work began to be the trade itself, as evidenced by the A.D. Willis advertisements. It is not known when colour began to be applied via letterpress, since the earliest items may well have perished. But it is evident from advertisements and from surviving items that colour from the press was being added by local letterpress printers as well as those using the lithographic processes, that is, colour printed items from both the major printing processes established in New Zealand were increasingly appearing in the latter part of the nineteenth century – from around the mid-sixties onwards. That the job printing department at the Queen Street premises of Wilson & Horton was capable of a wide range of printing in the seventies is evident from the 1876 advertisement that appeared in the *Auckland Weekly News*: “Printing of all kinds executed on the most reasonable terms, at the office of the Daily Southern Cross and Weekly News Co. Ltd.”¹²⁷ By 1891, such printing had expanded and there was evidently

much competition. For instance, in the absence of price agreement, the Master Printers' Association being described by R.C. Harding as being in a "precarious state", the price-cutting in this field of printing had resulted in slim profit margins for Auckland printers. A comparison between prices being charged for the printing of handbills and circulars in Auckland and Dunedin at the time given in *Typo* to show the discrepancy was noted by Harding as being even more for cards. In Auckland, he said, prices had become "absurdly low".¹²⁸

Surviving Artifacts

From a closer inspection of some of the surviving artifacts that were printed by firms executing jobbing printing in colonial New Zealand, some of the ways in which colour printers were using the colour processes at their disposal to provide the local market with all manner of ephemeral print products can begin to be discerned. For this research, inspection of examples of such artifacts was carried out mainly in the Hocken and the Alexander Turnbull Libraries.¹²⁹

Colour For Advertisement and Notice: Posters

In Canterbury, where printing had arrived in the colony with the first four ships, the first piece of printing from the *Lyttelton Times* printers had been a small handbill. Produced to notify settlers about selection of lands, it had been produced in the first days of January 1851 on the press just unloaded from the ship.¹³⁰ As had been the custom in England and Ireland, some of the settler-printers were early introducing the element of colour into posters by printing in black ink on a coloured ground. For instance, such a northern hemisphere poster that had been printed for the New Zealand Company at the Reporter Office in Limerick "early in 1842"¹³¹ to announce "Free Emigration to New Zealand", had the words printed in poster types on a rainbow-printed background. Commenting that not many people had yet migrated to New Zealand, "the flood being to America," the poster advertised the coming "expedition from Dublin to the second settlement of Nelson." In the New Zealand colony, in the same year that Canterbury printing had begun with the printed flyer, a Wellington poster that entreated the "electors of Wellington" to vote at the "Election of Commissioners" had been printed at the Independent Office on September 18th 1851 in the eye-catching colour scheme of black on yellow paper.¹³² However many early posters were simply printed in black on white, such as the 'Sale by Auction!' poster of March 1852, printed at the Wellington Spectator Office to advertise household goods, as well as "5 superior cows, well bred from English Mother" that were to be sold at Homewood, Karori. Factors that facilitated the later nineteenth century production of colour printed posters were

the mechanised iron presses that enabled speedier production and larger formats, cheaper paper, the availability of reliable coloured inks, the advent of suitable poster and display typefaces, and lithographic techniques; the latter especially suitable when colour work was required on a larger scale, or where text and pictures were to be combined.¹³³ By the eighteen sixties, the introduction into New Zealand of the Wharfedale machines, known for their reliability, would have facilitated such everyday jobbing printing required in the colony. Bernard Seward has pointed to such a machine, an “extra-Quad Royal two-colour Elliott” that had amply demonstrated this sturdy and dependable quality: it had remained in “near perfect condition” after more than a hundred years of extensive use for poster work in John Organ’s printing works in England.¹³⁴

As time went on, posters dealing with many subjects were printed in colonial New Zealand, often in simple letterpress, perhaps on a coloured ground, or emboldened with one or two coloured inks. Many such posters were produced from newspaper offices, for instance, the *Evening Post* in Wellington, or the *Star* in Auckland. From a set of around 175 records relating to mostly locally printed posters held in the Turnbull Library Ephemera collection from the study period, it could be seen that about a quarter featured colour, and that this printed colour had increasingly been employed towards the end of the century to bring to notice information about such subjects as shipping, drama, retail, opera, music, cinema, circuses and buildings, with typically several on each subject, although other diverse subjects, such as transport, horticulture, fire, trams, beverages, meat, alcohol, war and politics were also represented. Many of the New Zealand posters to 1914 can be seen to have been the instruments of official proclamation, public announcement, notification of entertainment and sporting events, while others were for propaganda purposes or to advertise retail goods.¹³⁵ Besides these, posters dealing with real estate were common, but as these are closely related to maps and plans, they have already been mentioned with that class of print product in the preceding section.

It could be seen that throughout the study period many locally printed posters had been produced as letterpress items, but after the turn of the twentieth century, the posters that have survived and that were more elaborately coloured had more commonly been chromolithographed, especially those containing both text and image, reflecting the overseas trend that had gathered speed in the nineties for the pictorial poster. (Appendix 2C, 775.) However, examples of lithographed posters that were in colour also survive from earlier periods, such as the 1883 textual poster advertising “Steam to London direct, by the New Zealand Shipping Co.’s line monthly” (Plate 53.) For this poster, from Wilson &

Horton, the text arrangement and New Zealand Shipping Company flag have been lithographed within a decorative border, all in colour.¹³⁶ Posters printed at the Wellington Evening Post Office were examples that appeared typical of the letterpress posters of the eighties and nineties that have survived and are held in the Turnbull Library, exemplifying the use being made for colour work of the, by then, widely distributed large display types. An example of the range of typefaces that was held by one New Zealand printer in the mid-eighteen eighties, Matthews, Baxter & Co., of Dunedin, has been discussed by Keith Maslen, who commented that this firm had set up as printers' brokers for the English foundry of H.W. Caslon & Co., in the 1870s, from where much of their newer material appeared to have come after that time.¹³⁷

As was usual for most printing equipment, from the early days of printing in New Zealand, most such display types were imported; at first especially from Britain and but later from Australia and then America. In her article, 'Ornamental and Display Types Used by Commercial Printers in Colonial New Zealand', Kathleen Coleridge has said that in Britain, typefounders had been producing such ornamental display types since the last decade of the eighteenth century, and their use had spread to most British jobbing printers by the 1820s. This article has traced the sources of supply to some of the Wellington printers of such types up to the mid-eighteen sixties. For instance, after checking some of the range of jobbing types used by Samuel Revans, the printer of the *New Zealand Gazette*, established in 1841, against specimen books held in the St. Bride's Printing Library in London, Coleridge has found that "most of the types [identified] seem to have come from the Austin Letter Foundry of Wood and Sharwoods, with others from Blake Garnett (as Stephenson Blake was at this period) and some from Thorowgood."¹³⁸ A little later, it was apparent that some locally hand-carved wooden types were in use for the masthead and section headings of the *Wellington Independent*.¹³⁹

Such types would have been employed for poster work as well. Although not many posters from the early New Zealand colonial period appear to have survived, the conventions and typographical layout considered appropriate to advertising in successive periods is apparent from the host of black and white advertisements that appeared in the colonial newspapers and especially in the almanacs. From an advertisement placed by the major Sydney printer,

Plate 53: 'Steam to London Direct, by the New Zealand Shipping Co.'s Line Monthly...'
Colour Poster: 57 x 47.2cm. Lithographed by Wilson & Horton.
By permission of the Alexander Turnbull Library, Wellington, N.Z., Ephemera Collection.
Ref. No.: EPH-D-Ship-1883-01.

STEAM ^{TO} LONDON DIRECT

BY

THE

NEW ZEALAND SHIPPING CO'S LINE MONTHLY.

THE MAGNIFICENT, FULL POWERED, STEEL BUILT STEAMSHIP
BRITISH KING, 3559 TONS REGISTER
WILL BE DESPATCHED FROM

LYTTELTON

ON OR ABOUT THE 31ST MARCH, 1883, VIA THE STRAITS OF MAGELLAN.
THE LENGTH OF THE PASSAGE IS NOT EXPECTED TO EXCEED 45 DAYS.

TO BE FOLLOWED BY THE MAGNIFICENT, STEEL BUILT STEAMSHIP
BRITISH QUEEN, 3538 TONS REGISTER

OTHER FIRST CLASS STEAMERS WILL FOLLOW AT REGULAR MONTHLY INTERVALS.
FOR RATES OF PASSAGE MONEY APPLY TO

THE NEW ZEALAND SHIPPING COMPANY, LIMITED.

HEAD OFFICES: CHRISTCHURCH. BRANCHES AT EACH PORT THROUGHOUT THE COLONY.

Thomas Trood, that was published in the August 1842 issues of the Sydney paper the *Colonist* and reproduced by Coleridge, it can be seen that it was not only the founts of types and presses imported from Caslon and Figgins of London that were highlighted in such a notice, but also the printing inks that were available by then: "black and coloured, always on hand at fixed prices, warranted from the first manufactory in England."¹⁴⁰ Clearly some colonial printers were early making use of such coloured inks at the time, a likely way being their employment for poster production.

Early examples of New Zealand posters from the eighteen sixties for which coloured ink was used include the chromolithographed Dun Mountain Bus timetable produced in Nelson in the sixties, (see plate 6) and a two-colour 1865 poster produced by Creighton and Scales in Auckland depicting a sailing ship that sank in Cook Strait, reproduced in Ellen Ellis' book.¹⁴¹ This poster had been produced via two-colour letterpress. Also from this period is a surviving 1866 theatre poster from Ward and Reeves that was printed in coloured typography.¹⁴² However, at this stage, many posters were printed with a single coloured ink or simply in black ink on white or coloured card. Surviving posters from the Wellington printers of the seventies and eighties onwards show that letterpress printing in colours was being employed as a means of more effectively producing posters especially those for the purposes of advertisement that were required to catch the attention of the ever-widening colonial marketplace. At the end of the study period, a report in the *Canterbury Times* highlighted a lecture on the subject that had been given in 1914 by Thomas Russell in Liverpool, entitled 'Newspaper Advertising', in which he had expressed the opinion that it was advertising that had helped to keep costs of goods down in the past, and that the great expansion of manufactured goods by then meant that "the time...was ripe for a great extension in advertising." Moreover, he said, it had been shown that "the more an article was advertised the cheaper it became...certain articles of great value to the public could never have been manufactured at all had it not been that advertising ensured a sale large enough to warrant the putting down of the elaborate and very costly plants."¹⁴³

Recourse to surviving Wellington posters printed as a means of advertisement show that this genre had been prolifically produced in New Zealand, perhaps testimony to their efficacy. The use of a single coloured ink, perhaps blue or red for the text of a poster, was seen to be typically the simplest method employed to exploit the ability of colour to catch the eye without large financial outlay to the printer. Sometimes the use of a single coloured ink added an extra colour to the the background paper colour, for instance as seen in the 59 x 45 cm. letterpress poster produced by the Evening Press in February 1888 advertising in

red printing on contrasting green paper that the “Sale of A.G. Price’s bankrupt stock at Te Aro House will commence on Saturday! at 10am. [11 February].”¹⁴⁴ A letterpress poster from the eighteen-nineties was printed by the Evening Post in red and black ink to advertise the drama ‘Jo’ that was to take place at the Theatre Royal in 1891.¹⁴⁵ This was the time in which R.C. Harding was educating printers through *Typo*, as at the time the range of jobbing and display faces in New Zealand was relatively narrow. By means of articles and printed examples demonstrating principles, Harding was endeavouring to raise awareness of standards with regard to decorative printing, and to disseminate information that could profitably be learnt to ensure more effective and appropriate choice from the huge range of ornamental and display faces that were by then available from the type-foundries of many countries to printers wishing to import them. (See chapter 12.)

Two letterpress posters from the turn of the century that showed printers were by then becoming more adventurous in their use of letterpress colour were both produced to announce musical events being presented for the entertainment of Wellingtonians over a century ago, in April 1899. Both, again printed at the Evening Post premises, demonstrated effects that could be obtained by the introduction of a second coloured ink. One had been simply colour-printed using an arrangement of varied text styles, Victorian and Art Nouveau, that were printed with alternate lines in red and green, to advertise the ‘Ernest Toy Concert Company’ evening to be held at the Grand Opera House, Ernest Toy being billed as “the marvellous young violinist”.¹⁴⁶ For the other poster, promising “A memorable event, Monday April 17, 1899, the people’s favourite Pollard’s Opera Company...Saucy Susie”, red and blue inks had been similarly used to print the arrangement of text in varied types on cream paper.¹⁴⁷ The imprint at the bottom, “Printed at the Evening Post Theatrical and General Printing Office, Willis Street, Wellington”, was indicative that this office specialised in such jobbing printing. Entertainment posters such as these continued to appear from this office in the early twentieth century, for instance a striking 1905 poster with the text arrangement printed in black and red on yellow paper that announced ‘Abomah Entertains’.¹⁴⁸ In this case the poster, referring to Abomah as “the tallest lady in the world,” reflects not only the design and printing styles, but also another entertainment interest of the time. A poster printed around 1914 by the Evening Post, to advertise “Fire-walking fanatics from remote parts of the world!...” was printed on a yellow ground with red and black print, and used woodcuts to show three figures in loin cloths dancing through flames.¹⁴⁹ Another colour poster from around that time was the block print in black and red on white that has been dated between 1910 and the 1920s that was printed for the New

Zealand Alliance for the Abolition of Liquor Traffic by the firm of Wright and Carman Ltd., of Vivian street in Wellington. This firm, which continued in business until the late twentieth century, later executed photolithographic work.¹⁵⁰

It was evident that as the pictorial poster had become more fashionable, and therefore more often requested, the lithographic processes of chromolithography and photolithography had begun to be more often used by New Zealand printers to produce such items locally, although it was also apparent that some of these jobs were being sent to Australian lithographers for printing. An example of a beautifully designed poster on a sheet measuring 48 x 31cm. was one that had been locally chromolithographed in 1894 in red, blue and sage green to advertise "The New Zealand Shipping Company Ltd., Monthly Service." However, this time, besides the fine lettering, the poster, printed by the Christchurch Press Company, incorporated a picture of a sailing ship. This item is also interesting from the point of view that it was signed by the lithographer "Fred W. Sears".¹⁵¹ Since chromolithographically printed posters were being produced overseas before they were commonly being printed in New Zealand, precedents were well established. One English example from the London printer W.S. Johnson was an 1879 poster that advertised "Fenby's patent "Paragon" Camp Furniture". This item had been chromolithographed in a stipple style in red, blue, yellow and green, with overprinting to form other colours used in the various geometrically shaped vignettes depicting scenes of people using the furniture. With red and white decorative lettering appearing against a royal blue background, the impression as a whole was of a design that would attract attention by means of the impact of colour.¹⁵² Although, however, it was stated at the bottom that this was a "Registered design. Copyright. Entered at Stationers Hall," such designs clearly acted as templates, in that it can be observed that this kind of format had been later used by New Zealand printers to structure some of the colour-printed graphic presentations produced for the special numbers of the weeklies.

That similar productions were appearing also from Australian lithographers who were sometimes colour printing posters for the New Zealand printers can be seen from the 'Union Line Poster' which was chromolithographed in a similar style by F.W. Niven & Co. of Ballarat and Melbourne in 1893, for issue by Frew and Glen, the proprietors of the *North Otago Times*, for publication as a supplement in that paper. This poster featured a scene of the South Island town of Oamaru (also reminiscent of A.D. Willis' views) with surrounding coloured vignettes of landmarks and businesses. Also in stipple style, the colour in the poster was built using warm tones of yellow and orange, both light and dark, with blacks and greys employed to add shading and darker tones. Where white highlights were

required, the white of the paper was allowed to show through.¹⁵³ F.W. Niven is known to have published not only posters, but other pictorial material for New Zealand clients in the last two decades of the nineteenth century.

Other Australian lithographers, such as Troedel and Company of Sydney and Melbourne, were producing chromolithographic posters used to advertise events in New Zealand, for instance for the May 1909 performance by “Allan Hamilton’s Dramatic Company” of F. Thorpe Tracey and Ivan Berlin’s “*Queen of the Night*” at the Wellington Opera House. With an arrangement of text over various dramatic scenes from the story, this poster was an example of a bold and arresting use of colour. In yellows, reds and blues and with firmly drawn outlines in black, the lithographer also had made effective use of dark and light contrast.¹⁵⁴ Johannis Troedel, who had founded the Australian firm, had arrived in Melbourne from Schleswig-Holstein in 1860, and had over the years employed artists who were highly talented colourists, for instance the artist Arthur Streeton.¹⁵⁵ At the time many

~~chromolithographic posters were produced for Australian audiences that is in London.~~

time, advertising of a similar kind was being run in special numbers of the weekly newspapers, for example in the *Weekly Press* Christmas number for 1904, a fullpage advertisement for “Golden Apple Cider” had appeared in chromolithographic colour.¹⁶⁰

By the early twentieth century, the success of the half-tone had given rise to a poster style in which dot patterns were employed to create bold simple images that suggested photographic pictures. Sometimes coarse half-tones themselves were used, often as part of a poster style exemplifying a general simplification of overall colour. An example was the poster printed by the New Zealand Times Company around 1900 to advertise a circus—Ridgeways Circus and Menagerie, for which letterpress in red and blue formed part of an arrangement that incorporated inset images of circus performers and animals all printed in blue; some that had originally been line-block images, some imitation halftones, and one that was a true half-tone portrait.¹⁶¹ A later poster from the second decade of the twentieth century that had been printed by the Caxton Company in Dunedin for Barton’s circus was entirely produced in blue and white.¹⁶² As more photomechanically printed halftone images became incorporated in print products generally, posters were no exception. For example, for the locally printed Wellington Corporation Tramways poster from around 1910 pointing out “the wrong way to alight from this car...” red lettering had been employed together with three scenes of people and tram carriages, all printed as half-tone images in black and white. This poster bore the imprint “Lankshear, Printer, Wellington.”¹⁶³

For Entertainment and Other Events: Programmes, Invitations etc.

Another group of print products that pair naturally with entertainment posters are the programmes needed at the relevant performance or event. Such items had sometimes been printed on coloured silk, an example being an 1867 poster printed at the Independent Newspaper Office in brown letterpress on cream silk for an evening dramatic performance.¹⁶⁴ However, card and paper were commonly used, giving rise to a comment on the Wellington concert scene around the turn of the twentieth century that took a negative view of the presence of paper programmes at the kinds of entertainment enjoyed by Wellingtonians:

band-playing and instrumentary gratifications of the lighter kind—but their ears have not become attuned to the chef-d’oeuvres of the masters. One is always impressed with the nonchalance of the audiences at the higher class of concerts which are given here...[the audience tries] to enter into and enjoy the harmonic raptures of a Schubert, a Beethoven or a Greig.... but there are always those who cannot conceal their ennui—it is undemonstratively demonstrated by surreptitious yawnings, and by the rattle, rattle, crash, crump, and crumble of those dreadful programmes, which are generally so large and assertive of the virtues of Somebody’s Soap...¹⁶⁵

Be that as it may, by then the colonials were no strangers to classical concerts, as evidenced by some of the surviving programmes. One from 1881 was for a concert that had been held

in association with the Wanganui Exhibition of Art, Science and Industry in aid of the Wanganui Public Library. This programme, for a “Grand Instrumental Concert,” had been printed by letterpress means by the Wanganui printer, H.I. Jones in several coloured inks: the fancy border in red and green, the inner ‘scroll’ edging in purple, and the decorative textual arrangement in green, purple, red and black.¹⁶⁶ A programme that also acted as the ticket, produced for a “Local and Instrumental Concert” held in lower North Island town of Fielding on Friday August 17th 1883 at the Town Hall, was printed by “Star Print.” The gold ornamental border on the outside framed the decorative text that was printed in purple, while the edging was in royal blue.¹⁶⁷ These items are examples of decorative letterpress colour work executed by New Zealand printers in the early 1880s in the pre-*Typo* years. Also from the eighties was a letterpress programme printed in black on blue paper, while a companion flyer was in black on yellow. Again consisting of a textual arrangement with a decorative border, they were printed by the New Zealand Times Company for a performance of Mendelssohn’s oratorio *Elijah* that was staged for the 1885 New Zealand Industrial Exhibition.¹⁶⁸

In the following year, a particularly attractive programme front cover had been produced by the “Press, Christchurch” for the local Amateur Operatic Society charity performance of Offenbach’s *Madame Favart*.¹⁶⁹ With one version on heavy blue paper, and another on smooth white paper, both were printed with Victorian borders, the decorative initials in red and black, the corner pieces in red, and the text arrangement in black. (Plate 54.) On the back of the thinner white paper version can be seen the embossing associated with relief printing. From the Auckland Star Office had come an 1887 programme featuring an adventurous layout, for the opening of the Free Public Library and Art Gallery. With each of the four sides printed in two-colour letterpress, all the fancy borders, initials and ornaments were in blue and green-gold, and the layered effects included line-block images on various pages; of the public Library building; a portrait; and a tiger lily. Under x 10 magnification the ‘ink rim’ characteristic of letterpress printing can clearly be seen. In the same year, a programme printed in three colours by the Wellington printer “MacCurdy” of Featherston Street was apparently accomplished by a combination of letterpress and

Plate 54. ‘Madame Favart, Opera Comique, in Three Acts.’ Music by Jacques Offenbach. Programme cover: 26.6 x 20.8 cm. Printed by the Christchurch Press for the Christchurch Amateur Opera Society.
Theatre Royal [Production], 28th, 29th, and 30th October 1886...
Letterpress by Christchurch Press.
By permission of the Alexander Turnbull Library, Wellington, N.Z., Ephemera Collection.
Ref. No.: Eph-B-OPERA-1886-01-front.

Christchurch Amateur Operatic Society.

THEATRE ROYAL.

28th, 29th, and 30th October, 1886.

UNDER THE PATRONAGE OF LADY WILSON AND LADY VISITORS OF THE
CHRISTCHURCH HOSPITAL.

Performance in Aid of the Funds for the Maintenance of Destitute
Hospital Patients in the Rhodes' Convalescent Home.

MADAME FAVART.

OPERA COMIQUE, IN THREE ACTS.

MUSIC BY JACQUES OFFENBACH.

English Adaptation by H. B. FARNIE.

.....
(By kind permission of Messrs. Williamson, Garner and Musgrove.)
.....

Conductor	MR. ARTHUR TOWSEY.
Leader of Orchestra	HERR CARL V. BUNZ.
Pianist	MISS MARCH.
Stage Managers	Messrs. KINSEY and STEDMAN.
	A. H. ANDERSON, Hon. Secretary.

lithography. The blue border column design, which featured drawings of instruments at the top, and the background yellow printed inside the border was probably lithographed; but the black textual arrangement was printed by letterpress, probably on top, as the embossing that can be seen and felt on the back matches that portion of the printing only. The programme was for an organ recital given in St. John's Church, Willis Street.¹⁷⁰

Two very interesting programmes that were printed in colours in the late eighties by Bock and Cousins appear to have been accomplished using the techniques of block printing in the Chinese manner, reminiscent of the print included by Roderick Cave to illustrate his 1998 article 'Dinner with the Wangs: Ceremonial Papers of the Chinese, Part 3' in *Matrix*.¹⁷¹ Printed by Bock and Cousins to produce two programmes for operas performed by the Wellington Amateur Operatic Society in 1888 and 1891, these New Zealand items appear to have been block printed on fragile paper. At the time, William Bock was the Treasurer of the Operatic Society. Of large size (both are about 33 x 44.5 cm.), the 1888 programme was for a December 14th performance of the *Mikado* and features Japanese figures in black outline filled in with printed solid colours; some in deep blue, others in dark purple, red, green, yellow or grey on a background border printed in a light blue solid. Register was poor.¹⁷² The 1891 programme, for a May performance of *Iolanthe*, appears to be a similarly printed production, although the decorative border of flowers and figures was designed in a less formal manner, and in this case the solid colours used were purple, blue, green, red and pink.¹⁷³ The central textual arrangement was printed in black in both cases.

However, these programmes were exceptional: if colour was used, for economy of production it had often been confined to the background card or paper, as was the case for posters. An early programme of this type was one that had been printed in black on pink for the Christchurch festivities held in July 1863 to mark the marriage of H.R.H. Prince Albert Edward and Princess Alexandra of Denmark, produced by printers who were at work during the festival procession. For many programmes, if colour was required it had been usual at first to employ ink of one colour only—any of several on white, or perhaps on a coloured substrate. Even towards the end of the century, such spare use of colour appeared typical, as seen for example, on the programme from around 1900 printed at Gisborne by "Gisborne Times Print" for a variety show. This item had been printed in black on a tan card cover with a plain black border, and with the several inside pages of text in black, but with advertisements printed in red.¹⁷⁴ Another from the decade of the nineties was a programme of twenty-six pages that was printed in red and black throughout for the Second New Zealand Music Festival held in the Wellington Opera House in October 1894. Lyon and

Blair, the local printers of this item, had used red ink to pick out all fancy borders and titles from the black text, while the front cover text and ornamental printing was also in red and black.¹⁷⁵ A similarly printed programme, for the Royal Footlights, contained an inside advertisement for 'Watsons Whisky' in red on each of the eight pages, where the text was otherwise in black.¹⁷⁶ Letterpress colour was sometimes being effectively used to incorporate simple graphics, as for the souvenir programme for the musical play, *A Trip to Chinatown* performed in 1900 "in honour of the visit to the Theatre of the Officers and Men of the Second New Zealand Contingent, enrolled for service in the Transvaal War."¹⁷⁷ Printed by the Evening Post office, the cover of this item, which had the text in blue, also featured three flags in red and blue.

Towards the end of the century, the more elaborately produced programmes that appeared were often chromolithographed, again, often by the printing houses that were responsible for the special colour work carried out for special issues of the weeklies, although programmes such as these were less common. Programmes around this time also began to contain a greater number of half-tone images, especially portraits, and, as alluded to by the commentator above, advertisements were also commonly printed in programmes by this time. Some of these advertisements could be quite elaborately printed, usually to be in keeping with a more expensively produced programme. An example was the cover for the programme that was chromolithographed around the turn of the century for a performance of the drama, *The War of Wealth* starring Bland Holt. Printed at the New Zealand Times office, some of the printed colour had been applied as a prepared tint. The same colours—brown, aqua, avocado, navy blue and gold blocking were used for both the front design as well as on the back of the programme to print the advertisement for "Vitadatio the great herbal remedy".¹⁷⁸ As for posters, it was apparent that some programmes were printed for Australasian use, such as that for the Wellington performance of *In Sight of St. Paul's*. Appearing in striking reds and yellows, it had been printed by Morgan and Bowden of Melbourne in 1897. Also from around this time had come a publicity foldout sheet and an August 1900 programme for Mr Clifford Walker's 'Drawing Room Entertainment' that exemplified the increasing use of half tone. In these beautifully printed items the portrait on the front of both had been produced by the process specialists, McKee and Company of Wellington who used red to pick out capital initials and for the borders, purple for the image on the programme, and navy blue for the text in the publicity flyer.¹⁷⁹ Job printing of this kind from the early twentieth century period also tended to feature the primary colours red, blue and yellow to suggest the newer tri-chromatic processes, and demonstrated the trend

towards the simplification of colour schemes that was occurring particularly for chromolithography. However, greater use of the primaries was in evidence even for letterpress items, such as had been used for the 1905 programme by "Post Print" for the play 'Pretty Peggy' that was printed on yellow paper, with a blue half-tone of the actress Nellie Stewart and the textual arrangement in red and blue letterpress.¹⁸⁰

Invitations and Certificates

Special occasions had always provided the colour printer with opportunities for ornamental work for such items as publicity brochures, programmes, invitations and certificates. Colour printed certificates had been among the ephemeral items produced by the chromolithographic pioneers Ward & Reeves who had produced the Honorary Certificates awarded at the 1865 New Zealand Exhibition in Dunedin. Henry Heath Glover, who was responsible for the work, had been praised for their high standard of design and chromolithographic reproduction. (See chapter 7.) Also in connection with the Exhibition, Fergusson and Mitchell (of "Dunedin and Melbourne") had printed season tickets, using coloured inks. Some were in red or blue on white card, and others in gold ink on green card.¹⁸¹ From the end of the following decade, the large certificate recording the award of "first prize...to McDonald and Muller, Ham and Bacon Curers, Green Island" which was colour printed by Mills Dick and Co., the Stafford street Dunedin lithographers and general printers, is a surviving example of this category of ephemera. For the 1879/80 Sydney International Exhibition, this certificate had been printed with lettering and a decorative border in red, brown and black, and is an example of a reverse trans-Tasman colour printing commission.¹⁸²

As time went on many ornate items tended to be printed for such occasions using the more complicated chromolithographic techniques, and this trend continued well into the early twentieth century. Other certificates were printed in simple colour, for instance the Education Board of the District of Wellington 1891 certificate that had been printed in pale red for the School of Design by Bock and Cousins.¹⁸³ Certificates for the ubiquitous local agricultural shows became a large category, some early examples printed in colour being those for the Auckland Agricultural and Pastoral Association's first annual exhibition in 1877. One of these, a 'First Class Certificate of Merit' which had been printed by Wilsons and Horton in green, gold, red and black, showing images of animals, farm scenes and farm buildings, was effectively designed with the images in various-shaped 'windows' in the solid gold background within a fancy border. Other panels contained title and space for the recipient's name.¹⁸⁴

Often arising in association with events of national importance such as the occasionally occurring exhibitions and royal visits, the need for decorative invitations and certificates provided the job printers with occasional colour work of this kind. One example was the invitation to attend a Maori demonstration at Rotorua on 15th June 1901 that had been chromolithographed by the firm of A.D. Willis as a 'Souvenir of the Royal Visit to New Zealand'. (See chapter 8.) Another item of this kind, produced for the 'Opening' of the 1906/1907 New Zealand International Exhibition in Christchurch on Thursday November 1st 1906 was a large invitation in booklet form, printed by J. Wilkie and Co. Ltd. in stipple style chromolithography. The front cover image, showing a Maori and a European girl draped with a New Zealand flag that encircled them as they stood side-by-side under a carved Maori gateway, was a 'cut-out' that was pasted against a black background to emphasise the colour. It had been executed in twelve colours; two yellows, two reds, three blues, two browns, grey and black. Under x 10 magnification it could be observed that the greens had resulted from the overprinting of light blue on light yellow, and that, for extra contrast, a middle blue had been printed over yellow to give sea green. The decorative words "Haere Mai" above the image and "Welcome" below were in silver blocking, which was also used for a similarly treated image of a silver fern on the back cover. Over the 'cut-out' fern had been printed the official seal, built by overprinting red, yellow, pink, brown and black, in that order.¹⁸⁵ The 'Official Programme of the Closing Ceremony', printed by the Lyttelton Times Company, was also in colours, showing the seal in red and brown, and with the lettering and rules in gold.¹⁸⁶

In Auckland, a chromolithographed invitation similar to these had been prepared, also for the 1901 Royal visit of the Duke and Duchess of Cornwall, but this time printed by the Brett Printing Co. The design contained a decorative text arrangement, views of the harbours of the four main centres framed with decorative scrolls, one in each corner, portraits of the royals at each side, and, at the bottom, a crest, flags, and figures of a European soldier on the left and a Maori on the right. The invitation was to the ceremony for the laying of the foundation stone of the new Wellington railway offices by their Royal Highnesses at Wellington on 20th June 1901.¹⁸⁷ Elaborately colour printed by the Brett Printing Company graphic artist, William Schmidt, such invitations are indicative of the importance of such events to the colony and also of the business opportunity found in the attendant celebration and ceremony on the part of colour printers throughout the country. Such occasions clearly gave them cause for special effort on jobs that would have brought in extra financial reward.

In a pioneering society, one of the most important considerations was the establishment of a reliable and palatable food supply. Although the environment in both Australia and New Zealand afforded some natural food sources, and early settlers obtained other desired familiar food items via supply ships, nevertheless one of the first tasks was the establishment of gardens and orchards from which fresh fruit and vegetables could be harvested. Nurseries were gradually established to ensure an ongoing supply of seeds and plants, and for the information of the local population of gardeners, orchardists and horticulturalists, regular printed lists and catalogues began to be printed. Like the gardening books, at first these were usually printed in black and white, with any addition of colour confined to the card of the cover. One such item from 1872/73, the *Catalogue of Plants Cultivated for Sale by William Martin Nurseryman and Seedsman, Fairfield Nursery of Green Island* was printed in Dunedin by Mills, Dick and Co. The yellow cover was printed with a textual arrangement, a border and a woodcut design of a basket of flowers, all in black.¹⁸⁸ A later 1880 version, from the same printer, was covered with a heavy spring green paper (on the outside only) and again printed in black—this time with a decorative border and an oval woodcut plant design. Commercial printers were not the sole producers of this kind of print product. As pointed out by Roderick Cave, the Nelson horticulturalist, Henry Budden, who was also an amateur printer, was producing his own catalogues in the mid eighteen eighties. Cave refers to this printer in *The Private Press*. In the chapter 'Fine Printing Down Under', after introducing William Golder as New Zealand's first amateur printer, Cave says:

But there was at least one other amateur printer in Victorian New Zealand, the horticulturalist Henry Budden at Nelson in the South Island. To further his business, Budden acquired a small press in 1884 to print his seed catalogues, billheads, and other items, and most of the printing was done by his teenage son, who eventually became a trade printer.¹⁸⁹

However, nursery catalogues seldom featured printed colour until the following decade when a few such items appeared with chromolithographed coloured images, especially placed on the covers in order to attract market attention – the catalogue was the means of advertising the nurseryman's wares, and colour was an element that interested many a gardener. An 1890 catalogue of native "Ferns, Seeds, Plants & Shrubs & Trees" entitled *Matthews Descriptive & Priced Catalogue of New Zealand Flora* that was produced for Matthews Nursery (established in 1850) was presented with the cover design handsomely chromolithographed on both the back and the front. Attributed to Dunedin's "J. Wilkie & Co. Color Printers", the front cover was printed with a decorative spray of 'Ranunculus

lyallii', achieved using overprinting of blue on yellow for the greens, as well as yellow, grey, brown, and black. The decorative lettering and the design, within a gold circle that had been printed last, was on a background sectioned into yellow, gold, and grey. The back cover was similarly colour printed but here the design was of 'Celmisia verbasifolia'.¹⁹⁰

It was not until the early twentieth century that this kind of colour decoration and illustration was to become more common for nursery catalogues. Even in the eighteen nineties, if colour printing was used it was more likely to have been in the form of a simple two colour scheme, often printed by letterpress methods, such as had been done for a Nairn catalogue of 1893, which had been printed with two coloured inks on the blue card cover by Russell and Willis in Christchurch. A similar item was the Horton's 1899 catalogue for which the covers, "printed at the Herald Office, Pahiatua," were in navy and red.¹⁹¹

Some catalogues of the period were produced for other retail activities, such as the job that had called for two-colour lithography for an extensively illustrated catalogue of furniture and hardware that had been undertaken for Guthrie and Larnach in the eighties by Coulls and Culling but never finished. (See chapter 7.) In the decade of the nineties, an example from Wellington was the catalogue showing a range of hats for sale at Hill & Sons, Hat and Cap Manufacturers, that was produced by McKee and Gamble in 1897 with some of the lithographed illustrations in colour.¹⁹² But it appears to have been the later horticultural catalogues in particular that appeared with more extensive colour printing in the early twentieth century. For instance, D. Hay & Son's *Descriptive Catalogue 1899-1900, with Novelty List*¹⁹³ had been published at the turn of the century with covers printed in several colours by Wilson and Horton. With an arrangement of assorted text styles, and some decorative elements, this item was lithographed in red, green, brown and purple, with some tomato red formed by overprinting, and a brown outline design that was printed on top. While the inside was in black and white, the illustrations were variously produced; some were relief line or half-tone; some were lithographs, and some collotypes. The back cover, also colour-printed, featured a large illustration: a sprig of five Clyman plums with leaves, probably produced as a transfer lithograph in green and purple, with the black 'key' image, originally a line engraving, printed on top. The text advertised the fact that D. Hay & Sons were the "introducers of Burbank, Satsuma, and other Japanese plums."¹⁹⁴

By this time, the Nairn catalogues were also being illustrated in chromolithographed colour. For the front cover of the 1901/02 catalogue, an arrangement of text, the decoration and a potted palm all had been built up with outlines in various colours: with some of the solids in

prepared tints, and with stipple-style shading. On a duck-egg blue coarse spatter pattern background, the design had been executed in several colours including reds, blues, greens and gold by the Christchurch Press Company.¹⁹⁵ Later catalogue covers were also colour printed, and by the 1906/07 issue, not only were the covers in colour, but about a dozen chromolithographed plates were included, especially to illustrate *Lilium* and other flower varieties, all printed in a similar style by the Press. For example the 26 x 19.5 cm. plate showing 'Clematis Varieties' had been built using some manual stipple and some prepared tones, for instance for the blue on the variety 'Madame Edouard Andre' in the bottom left-hand corner.¹⁹⁶ (Plate 55.)

For the catalogues published for the Pahiatua nursery of Thomas Horton, colour printing was also being employed in the early twentieth century to highlight the specialties available for sale. One attractive chromolithographed image from this period shows an arrangement of various fruits, with two pears in a central circular panel, in which are the words "Thos. Horton, Pahiatua": it was probably detached from a catalogue that was printed around 1904, as the staple holes are visible. This effective image, printed by McKee and Co. of Wellington, has mainly been built up of solid colours but with tones and shades in prepared tints: there is no photographic outline.¹⁹⁷ (Plate 56.) The Horton catalogue for 1904/05 (which has the front cover missing) bears the imprint (on the back page) "C.M. Banks Ltd. Printers and Lithographers, Wellington," and is another example from the period with complex colour illustrations. For instance, one page has a colour lithograph showing a 'Prince of Wales' peach in the centre, surrounded by a 'William Bon Chretien' pear, a 'Madame Melba' strawberry, a 'Brigg's Red May' peach and a 'P. Barry' pear, for which coloured textured tints have been used in such a way as to resemble a colour half-tone, but close examination shows that the dots are regular, except at the edges where there are partial dots, as if cut. The textured colours used were the primaries: two shades each of red, blue and yellow, as well as black and textured green, to which blue tints had been added on top to create shades of green.¹⁹⁸ The firm of C.M. Banks later became stationers.

A year later, Horton's *Descriptive Catalogue* (for the years 1905-1910) appeared with process colour giving it a modern look. The front cover illustration was a four-colour image of a woman picking apples from a tree, and four colour illustrations of different rose varieties appeared inside. This catalogue had been printed by "E.S. Cliff & Co., High-Class Printers, Karamu Road, Hastings. H.B." who had used an original "H.N. White Road Photo." as the basis for the front cover image. The rose photographs appear to have been printed with the yellow impression first, then the red, followed by blue, and with the black

impression last. Poor register makes the order discernable, for instance, in the illustration of the rose 'H.V. Machin'.¹⁹⁹ Around this time, chromolithography was still being used to produce illustrations and catalogue covers for other similar items, for instance for the 1907 Jas Laird and Son of Wanganui catalogue for which the tipped in colour plates of roses had been colour printed in this way. Although "Benoni White. Del." is acknowledged as the artist at the bottom of the front cover, there is no name mentioned for the chromolithography, although the initials "TB" appear also near the bottom.²⁰⁰ As was the case for the supplements for the special numbers of the weeklies, colour printing practice in the early twentieth century to the end of the study period appears to have been in a transitional state in which colour images printed via the old art processes existed side-by-side with those from the newer photomechanical methods.

Food Labels

Another activity that was centred around foodstuffs in the colonial setting was the packaging of bulk wholesale supplies into smaller quantities for the retail sector. Towards the end of the nineteenth century such activity began to provide fertile ground for colour work as printers were called upon to produce suitable labelling, for instance, for food items for domestic use or for export that would have led to the need for a plethora of labels of this kind by the end of the century. Many such labels were colour printed to make them stand out in the marketplace: colour was one ploy used in the attempt to gain market edge for a particular brand. A snapshot of the activities of, and products from some of the packaging firms for which labels were printed can be gained from the description of the stands they mounted at Exhibitions, for instance the exhibit of the Empire Packing Company at the 1895 Canterbury Industrial Exhibition that was described in the September 12th 1895 issue of *Canterbury Times*:

Plate 55: 'Clematis Varieties Including Lilacina, Gipsy Queen, Madame van Houtte, Jackmani Superba, Madame Edouard Andre, Nelly Moser.'

Illustration from Nairn Nursery Catalogue 1906-7: 26 x 19.5 cm.

Chromolithographed by the Christchurch Press Company, published by Nairn & Sons Ltd (Christchurch)

By permission of the Alexander Turnbull Library, Wellington, N.Z., Ephemera Collection.

Ref. No.: A-HORTICULTURE-Nairn-1906-37.

Plate 56: Illustration probably detached from a Thomas Horton Nursery catalogue of around 1904. Shows two pears ('William's Bon Chretien' and 'Beurre Diel') in central circular panel. Surrounded by (clockwise from top left): 'May Duke' cherries, 'Madame Melba' strawberries, 'Blue Diamond' plums, 'Brigg's Red May' peach, and 'Black Hamburg' grape.

Chromolithographed using mechanical tints by McKee and Co. of Wellington, published by Thomas Horton of Pahiatua.

By permission of the Alexander Turnbull Library, Wellington, N.Z., Ephemera Collection.

Ref. No.: B-HORTICULTURE-Horton-1904.

CLEMATIS VARIETIES
Much reduced in size

This company has set itself the commendable work of packaging into suitable quantities the various household requisites which are in every-day use. Amongst them are, in neat paper packets of various sizes, washing blue, blacking, starch-glaze, extract of soap, knife-polish, hops, spices, tea, coffee and pepper of various sorts; in tins are baking and egg powders, golden syrup, condensed milk of New Zealand manufacture and excellent quality; in bottles, lime juice, vinegar, oils, sauces, essences, curry powder and so on. All are neatly got up, and the system cannot fail to be appreciated by housekeepers. Mr A.H. Tompkins, Bedford Row, is the Canterbury agent.²⁰¹

Printed labels for such items were themselves exhibited at industrial exhibitions by the printers, for example those shown at the 1896/97 Industrial Exhibition by Ferguson and Mitchell of Dunedin, who exhibited specimens of lithographic and other printing, including their "artistically designed labels", which were among "the specialities the Princes street firm has long been noted for", and which were being brought "well to the fore" by Mr Thomas Barmby, the firm's representative."²⁰² From such labels that have survived²⁰³ it can be seen that production of this class of ephemeral items was one area providing job work for New Zealand colour printers in all the main centres, as well as in other places. (For label printing in Wanganui, see chapter 8.)

One firm ordering colour-printed labels from local printers, at least in Wellington and Auckland, was the Wellington Gear Meat and Freezing Company. Having begun in 1882, by 1896 the Gear Meat Company was carrying on extensive operations at Petone which over that time had grown from a scattered village to a township of 3000, largely because of the growth of that one company. A good example of the symbiosis that existed between such cutting edge companies and those that serviced its needs, the activities of the Gear Company that were by 1896 described as "one continuous success," epitomise the entrepreneurial enterprise that was needed in a colonial outpost such as New Zealand to allow it to establish the export economy on which the country's future economic health would depend, including the health of such secondary industries as printing. Not only by its efficiency, but also through grasping the potential of the new freezing technology and marrying it with an innovative idea, the Gear Company was one enterprise that had been able to return a continuous profit:

In addition to the enormous export trade in frozen and tinned meats, tallow and by-products, in which everything in any animal slaughtered is put to some economic use, the company does by far the largest retail butchering business both in the city and suburbs, and the shareholders have had the pleasant satisfaction of having all their capital returned in the shape of a steady ten percent dividend every year...[resulting from] the careful foresight of the original projectors of the company. Instead of building expensive freezing works, they purchased a ship and converted her into a freezing hulk, and built a jetty to connect the slaughter yards with their floating store house....[that can be towed to] a homeward bound steamer, and the muttons are transferred, and all the cost of railage and cartage saved.²⁰⁴

Meat preservation by canning had enabled the export of meat back to Britain before the advent of refrigeration and was an interim alternative to the live export of animals in the

days when it took a sailing ship about three months to reach London: it was reported in 1882, the year of the first shipment of refrigerated meat, that the sailing ship, the “Dunedin”, carrying 4,909 sheep and lambs, had taken 98 days to reach London.²⁰⁵ By the eighteen eighties the livestock that in New Zealand was chiefly farmed for meat had been diversified to include a number of the British breeds which were found more suited to the climate than, for instance the fine wool merinos of Australia that had at first been tried on some of the early sheep stations established in the Canterbury and Wellington provinces.

Tinned meat product labels that have survived from the late nineteenth century and that have been preserved in the Alexander Turnbull Library reflect the colour printing that was carried out for such items for the variety of meat products produced from New Zealand farms by that time. In addition, canned produce other than meat products were exported from the Gear Meat Company, as can also be seen from extant printed labels. Many of the colour printed labels needed for the Gear Meat Company tinned meats and other produce, such as tinned vegetables and soups, were printed by New Zealand printers such as Wilson and Horton in Auckland and Bock and Elliot, (later Bock and Cousins and then Bock and Co.) in Wellington, although some were printed overseas, for instance in America. Mostly produced in strip form, the comparatively long runs required for these items helped to make colour printing an economic option. A typical label from this period (estimated to have been produced between 1880 and 1890) was the one that was produced for a four pound round tin showing at one end a cattle beast inside a decorative border, with flowers down the sides, and at the other end a decorated panel containing the words ‘Stewed Tripe in Milk Prepared by the Gear Meat Preserving and Freezing Co^y of New Zealand Ltd.’. Between these panels were printed on the one hand “directions for opening” together with the significant “our meats are warranted to keep fresh in any climate for any length of time” and on the other, a list of the types of tinned goods produced by the company for which similar labels were also printed: “beef, mutton, brawn, haricot mutton, curried chops, ox-cheek, stewed kidneys, potted head, stewed rabbit, epping sausage, minced meat, tripe, ox tongues, sheep tongues, stewed steak, pig’s feet, and soups of all descriptions.” The 34 x 9.8 cm. ‘Stewed Tripe...’ label had been chromolithographed by Bock and Elliot in the solid colours yellow, light blue, red and green, overprinted with the black key and then glazed. The outline images of the bull on one panel and of a crest and exhibition medals on another were probably prepared via transfer methods.

Such label images could have been originally created in a variety of ways: as black and white lithographs, pen and ink drawings, woodcuts, line-blocks, and particularly as steel

plate engravings, with numerous identical images being transferred to one stone for lithographic printing. These would often have been transferred photolithographically as simple line images, with the tones added using techniques such as stippling and prepared tints. For later labels, four colour printing via offset lithography would have become the usual printing method for such long-run print products, but in New Zealand, this does not appear to have been a possibility until after the period under study. The style of label produced for the Gear Meat Company from the Wellington firm of Bock and Elliott was seen to change a little over time as the firm became Bock and Cousins, and later still when the labels from Bock and Co. were seen to be of a different character again. Other differences in label styles were no doubt also due to varying specifications from different clients, as, for instance, Bock and Co. printed labels for several meat companies. Differences in the style of the Gear Meat labels would also have been attributable to the fact that they were printed by a variety of printers, some offshore.

The labels surviving in the Alexander Turnbull Library Gear Meat collection that were from the Auckland firm of Wilsons and Horton are thought to have probably dated from the nineties, an example being a 34.5 x 10 cm. label for 'Corned Beef', (and for many other meat products printed in the same style) showing an arrangement of text and medals. With some stippling used to add tonal values, the label had been chromolithographed in the solid colours of tomato red over two shades of yellow and finished, before glazing, with a final black printing to give the appearance of an orange glow behind the words describing the specific food contained. From Bock and Cousins had come Gear Meat labels such as the 34 x 9.5 cm. label for 'Julienne Soup' which appeared in two different colour-schemes, both of which lacked black, and were consequently rather insipid compared to the Wilson and Horton labels, and even to other, probably later, labels from the same Wellington firm; and to the later Bock and Co. labels. The 'Julienne Soup' label, in mustard, aqua blue and red, was printed in that order, as can be seen under x10 magnification from some unintended colour overlaps. An example of a Bock and Cousins label which had been given a final overprinting in black and for which some stippling had been used for superior effect, was a large 'Roast Mutton' label (21 x 14cm.) intended for a 6lb. round can, for which tan and an additional two yellows had been employed.²⁰⁶ (Plate 57.) Other styles and designs from Bock and Co. were typified for instance, by a later decorative 'Rabbit and Bacon' label for the Marlborough Rabbit Trapping Meat Export Company that had been chromolithographed in dark blue, with gold-blocked lettering and a fancy border; and by a label printed in shades of red and black for the Wellington Meat Preserving and Refrigerating Company

that had been produced using a combination of overprinting in solids and patterns to furnish the tonal pinks and greys. Other labels from Bock and Company were chromolithographed for still other companies, for instance those printed for the Western Packing and Canning Company of Patea.

On the other hand, it could be seen that various colour schemes were tried for labels that were otherwise of the same design and that were produced in the same printing style. For instance the labels of the Gear Meat 'Julienne Soup' design were also printed with alternative coloured backgrounds such as aqua-blue or tomato red (for other products), and also in navy blue, a colour which introduced more contrast, for example, as printed on the 'Vegetable Soup' label. Other labels for which simple two colour printing had been employed were, for instance, the 34 x 4.5 cm. 'Stewed Kidney' label in red and maize yellow and the 'Boiled Mutton' label in royal blue and maize yellow. It could be observed that labels for Gear Meat were also printed at other Wellington firms, for instance, the modest less heavily glazed labels printed in primary colours that came from Turnbull Hickson and Gooder (which became Turnbull Hickson and Palmer around 1905). This firm was also responsible for the distinctive red, white and blue Gear Meat pyramid tin labels, for example, one for 'Cooked Potted Meats' that has survived from 1896. The design for this particular label was repeated at least until 1929.²⁰⁷ Another Wellington firm producing food labels which date from the late nineteenth/early twentieth century period was the New Zealand Times Company which chromolithographed the 'Swan Brand' labels, such as one printed for a 'Brawn' tin depicting a swan in one panel and a mountain, lake and rotunda scene in another – achieved using a coarse stipple style chromolithography.²⁰⁸

An example of a label that was produced in America for the Wellington Gear Meat Company was the 34 x 10.5cm. 'Prime Quality Mutton' label printed in the bright colours of yellow, orange, blue, red and black (in that order). Although of a similar nature to many of the locally printed labels, the more sophisticated appearance of this label resulted from the complex overprinting that had been employed, in this case to depict an image of animals standing by water in a half-moon shaped panel, and for which the final black printing gave an overall appearance that was sharper than that of some of the local labels from much the

Plate 57: Food labels:

1. 'Gear Corned Beef' (10 x 34.5 cm.) Printed by Wilson & Horton, Auckland for the Gear Meat Preserving and Freezing Company of Wellington.

2. 'Roast Mutton' (21 x 14 cm.) Label intended for a 6lb. round can.

Printed by Bock and Cousins, Wellington for the Gear Meat Preserving and Freezing Company of Wellington. By permission of the Alexander Turnbull Library, Wellington, N.Z., Ephemera Collection.

Ref. No. F-MEAT-Gear-012.

same period. The printers were the Schmidt Label and Lithographic Company in San Francisco, California, a firm that appears to have made a specialty of this class of jobbing printing. This label was not an isolated example, as the same company also produced labels for the New Zealand Peach brand tinned foods (as also did Bock and Company in Wellington). The new San Francisco mail steamer service, which by 1889 called at the port of Auckland, made the selection of a San Francisco printing firm understandable.

In this period, from around 1890 to 1914, some of the colour printed labels for New Zealand foodstuffs were also coming from the South Island printers, an example being the attractive and finely detailed label for "Sheep Tongues" which had been printed in primary colours and black by the Christchurch Press Company for the Canterbury Frozen Meat and Dairy Produce Export Company Limited. From the same printers came a label that was produced for the Christchurch Meat Company for 'Compressed Corned Mutton' that had been lithographed with excellent register in strong colours, to depict animals at their pastures as well as for the relevant text arrangement that was a part of all such labels. A chromolithographed label intended for a tin of 'St. George Haricot Beef' that was printed in a pictorial Victorian style was an example of this kind of jobbing work from the Dunedin firm Mills Dick and Company. Dating from the early twentieth century, this label had been printed for the St. George Preserving and Canning Company Limited.²⁰⁹

The decoratively colour printed 1914 'Price List of Table Delicacies' was a sign of the growing importance of the freezing processes that were by the end of the period being used to preserve meat for export. By then the Christchurch Meat Company Freezing Works, for whom the 'Price List' had been produced, had expanded to occupy several operational sites—all depicted as vignettes on this fold-out item which had been chromolithographed using solids and prepared tints in yellow, pale blue and red, also by the Christchurch Press Company. Beside the list of prices was the statement "C.M.C. Preserved Meats. Slaughtered, Prepared and Packed under the most stringent Veterinary Inspection in the World," a statement that was indicative of the importance of such measures to the export trade by then. Several years before, in 1906, a scare had been caused by allegations that in Chicago such practices were occurring within the industry as decomposed chickens being frozen, deodorised and tinned. As a result, news had at the time been received that not only was "America...appalled at the revelations of the methods of the Chicago meat packers," but that British, German and Japanese orders for tinned meats were decreasing, and in the case of New Zealand's important market in Britain, it was reported at the Gear Company 1906 Annual Meeting that due to the scare, "so far as Great Britain is concerned [there] is a

complete cessation of the demand for tinned goods of any kind.” Such news would have been a blow not only to the company, but also to firms such as the colour printers who supplied the labels for what had been a very large trade in tinned goods: the crisis would have gravely affected their orders for these items. Disquiet in Wellington as to inspection standards brought out the fact that inspection was supposed to have been documented by the presence of the inspector’s signature on every label of every tin of preserved meat, but that it had been found there was a case to be examined due to the fact that labels were being “signed in batches and handed over to the companies for use without further enquiry.” Subsequently, the results of a 1907 British investigation into New Zealand packing methods apparently had returned favourable results. However, the export of frozen meat from New Zealand was by then increasing, and the colourfully labelled New Zealand tinned meats, although they did not disappear, gradually became less prominent in the marketplace.²¹⁰

Brochures, Timetables and Other Items

For the stationery and cards that were printed for everyday business needs, a little extra interest was sometimes added through the use of a coloured ink, for instance to print an engraved memorandum or letter-head, the early twentieth century letter-head that was printed in royal blue ink for the Brett Printing & Publishing Co. Ltd. being an example.²¹¹ However most such letterheads were in black and white. Colour was more frequently employed for printed information that was to be provided to the public, especially in connection with transport and travel for such items as time-tables, tickets and posters. However, for this class of ephemera too, it was often the card or paper that was coloured, and if coloured ink had been used by local printers, it was often by way of the simple addition of one colour to the basic black. Stationery, cards and booklets that were produced for the shipping lines, because they were often produced for promotional purposes, had sometimes incorporated colour printing to catch attention. However, locally printed items such as these appear modest by comparison with some of the contemporaneous items that were printed by overseas firms, for example, the brochures and booklets produced by the Chicago printers Rand, McNally & Co. in the eighteen nineties for the “Via New Zealand Around the World” sailings of the American and Australian Line, that appeared with covers and maps chromolithographed in several colours.

A locally printed example of the same era of the nineties was the Union Steamship Company’s booklet brochure ‘Excursions to the West Coast Sounds by the Union Line. Nineteenth Season, Thirty-second Trip. First Excursion, 1896, From Dunedin on Wednesday, 22 January. S.S. Tarawera’, on which it was stated that “the accompanying List

of Passengers, Programme of Tour, and other Details are published for the information of Passengers.”²¹² Admittedly produced for a more modest tour, it had been printed by the Otago Daily Times office in simpler and more economically achieved colour: using purple for the six pages of text, light blue to indicate lakes and sea in the lithographed sketch chart of the ‘West Coast Sounds’, grey-blue to show relief and black for the basic outline, rivers and printed names. Much earlier material, for instance passenger lists for the New Zealand Shipping Company had been printed in London, even in the 1870s and 1880s, as were many other items such as menu cards, especially if colour was required. Items produced on the small printing press that was sometimes carried for use during a voyage would most likely have been printed in basic black and white.

Colour in Other Generally Used Items: Calendars, Bank Notes, Stamps

Calendars

Calendars were print products that were akin to posters in that they could be of a size to be hung on a wall, as had been sheet almanacs, and could also carry advertisements. Because of this, and also the fact that they were not only items of general usefulness but were decorative as well, they were sometimes enhanced with printed colour. In the local New Zealand colonial environment, colour for these items was seen to have been achieved both by letterpress and lithographic means. A letterpress example was the calendar produced in 1882 by simple two colour printing in black and red printed at the Lyttelton Times office. Entitled the ‘1882 Lyttelton Times Almanac & Supplement’, this item featured an arrangement of advertisement boxes (that provided much incidental historic business information) and columns around an engraved line block of Christchurch Cathedral.²¹³ A later lithographed example, also published from a newspaper office, was ‘Calendar for 1900 Presented by the Proprietors of the Taranaki Herald (Established 1852)’ that had been printed for the firm by “J. Hooker, litho., New Plymouth” in tan and green, and that included an effective Victorian-style border of the kind often seen in wallpapers of that period.²¹⁴ An unusual calendar from around 1910 featured fold-out portions and a spinning time-wheel, “the universal time indicator” by which times in other places could be determined. It was designated a ‘Chinese-English Calendar’. It had been printed in several solid colours: blue, red, avocado, and dark red, probably by a combination of letterpress and photolithography, the latter being used for a map.²¹⁵ Although no printer was recorded, this calendar was indicative of the fact that by then there was a considerable Chinese population in New Zealand.

Banknotes and Paper Money

The convoluted and interesting history of the printing of paper money in colonial New Zealand has been traced by R.P. Hargreaves in the book *From Beads to Bank Notes*.²¹⁶ Because of special requirements and difficulties associated with this class of print product, for instance, the requirement to provide for the prevention of banknote forgery, colour printing was found useful, hence information concerning colour printing techniques and capabilities that were used to this end can be gleaned from such a history. Although in pre-European times, the Maori had historically used a barter system rather than a system making use of either paper currency or coin, after European settlement this had rapidly changed, and as stated by Hargreaves, "by the 1850s Maoris in constant contact with European settlers had adopted a money economy almost to the total exclusion of barter."²¹⁷

In the early days, a shortage of money, due to the initial predominance of imports over exports, caused foreign money to be in circulation for a period before the first bank, a branch of the Union Bank of Australia, was founded at Petone expressly to issue local bank notes. The one pound note that was issued was a typical example of some of the early bank notes, in that it was printed on one side only: it bore the printed characters and a design on the front, but the reverse was blank. Sometimes plates for early notes were engraved in Australia, some for the New Zealand Banking Company at the Bay of Islands being engraved in Sydney—on copper for the larger £5 denomination and, presumably to provide for the greater quantities needed, on steel for the £1. At first, resort to overseas printing was largely because of the immaturity of the printing industry in New Zealand, but the early practice was to become the norm and the printing of bank notes or their equivalent on New Zealand shores was to be the exception rather than the rule. One of these exceptions occurred in the 1840s when the government, in the dire circumstances of bankruptcy, had resorted to printing promisory notes. These were printed in Auckland in the Government Printing Office, although they were not up to standard: merely letterpress items known as 'government rags' that were far from being forgery-proof. However, in general, forgery was not a common problem in colonial New Zealand due to the comparative lack of local skill in this specialised branch of engraving, until the advent of photolithography when the danger became greater.

Bank note printing for New Zealand passed through several phases, but in each phase right up until modern times such printing was only accomplished on shore for provisional or temporary note issues. Any printing of permanent or quality currency was carried out either in Australia or Britain, especially when specialist engraving and colour printing was

required, even after an 1847 Ordinance allowed the Colonial Bank of Issue to issue paper money under Governor Grey. In this case, simple colour printing was carried out as aid to the easy differentiation in denomination between notes which were engraved on steel and printed in London by Perkins Bacon and Petch with the £5 in light brown to differentiate it from the £1 in black.²¹⁸ Many agencies and individuals were involved at one time or another in bank note provision in New Zealand, including individual merchants, private banks and overseas banks. In the early days, some local merchants made attempts to cut down the likelihood of forgery by making use of woodcut designs, for instance to print notes with hay fork or wheat sheaf motifs, such as those found on early Edward Dorset notes in Taranaki.²¹⁹ However, anything requiring colour was routinely done elsewhere.

During the period up into the 1860s there was a great variety of paper currency in New Zealand due to the disparate endeavours of private firms and several overseas banks to issue notes: bank note printing was far from standard. One surviving from the period that was printed overseas for the Commercial Bank of New Zealand Limited was a £20 note dated "Napier 2nd January 1865" that bore the imprint "Perkins, Bacon and Co. London."²²⁰ At this time it is known that some of the engraved plates used to print bank and promisory notes for New Zealand were made and printed in simple colour in Melbourne by the firm of Fergusson and Mitchell. An 1862 example, a £1 note, was printed on watermarked paper in brown.²²¹ On the local scene, an early demonstration of the New Zealand do-it-yourself principle in connection with bank note issue occurred in the early goldrush days in Otago. At least one local bank manager produced his own bank notes in order to facilitate the purchase of gold, but the opposing bank had refused to redeem them.²²²

Around this time, in 1861, the Bank of New Zealand was established in Auckland, and over the years became responsible for the production of a great variety of notes, the first of which were printed in Sydney by W. Moffit, although even these were considered a temporary issue only. Permanent notes were then printed in London, some in colour, an example being the £5 BNZ note issued in the 1860s and 1870s that had the face printed in blue, with the reverse left plain.²²³ Later, temporary bank note issues for the Colonial Bank of New Zealand were printed by Fergusson and Mitchell in Dunedin, although through the eighties permanent issues were again printed in London. By this time a variety of complex printing procedures were in use to cut down the danger of forgery, and these included an increasing use of colour, the technique of rainbow printing, as well as more complicated designs, and the use of watermarks and special paper. In 1889, R.C. Harding reported in *Typo* that the Colonial Bank of New Zealand had brought out a new issue of notes:

They are printed in different colors, according to value, but all "rainbow" fashion in three different tints all shading into each other—a notion open to criticism from an artistic point of view, and hitherto chiefly in favor for playbills. The different values are on different sized papers, the larger value the larger the note—to avoid, one of our contemporaries sagely remarks, the risk of alteration or forgery.²²⁴

It was sometimes suggested that extra letterpress colour should be added to counter a general criticism that the notes of the period were not distinctive enough, indicating that the intrinsic colour schemes were not fulfilling the function of enabling them to be visually separated at a glance. This fault was evidently not unique to New Zealand notes, as the suggestion, which was adopted, was that "New Zealand banks should follow the practice of their British counterparts and print across each note in large red type the value of the note."²²⁵ However, according to the various choices made by different banks, in practice a variety of printing colours was used for the purpose, including green, brown, light brown and chocolate.²²⁶ R.P. Hargreaves mentions that an interesting occurrence of colour printed bank notes in New Zealand is thought to have originated through the second Maori King, Tawhiao, who set up a Maori bank, perhaps around the eighties. The notes associated with this bank were apparently printed in four colours. This fact surfaced through being taken as evidence to discount a claim that the bank may have been set up about 1860:

the use of four printing colours on the note suggests it dates from a later decade, for multiple use of colours on notes was not typical in the 1860s on even European bank notes.²²⁷

The fact that in colonial times the New Zealand government declined to take responsibility for the issue of sufficient coinage ultimately led to the issue of notes of smaller denomination as a substitute for the lack of coin. Thus it was that the printing of the 10/- issued in 1916 was this time carried out in New Zealand by the firm of Whitcombe and Tombs.²²⁸ However, the inferior pink paper used was not durable, and once again, printing reverted to England to allow use of suitable bank note paper. In fact it was not to be until well into the twentieth century that standards for the production of New Zealand bank notes were to be achieved, whether as to colour, design or even size.

Early New Zealand Stamps

Originally inherited from the Roman courier system, the British postal system evolved from the 1482 instigation of posts between which horsemen carried news during a war. After Queen Elizabeth's 1591 Proclamation that all official letters from foreign countries were to pass through existing posts, postal routes developed over the next century, and eventually the post was being carried by mail coach, from 1784 until the 1830s, when it began to also go by rail. By this time the Antipodean Australian colonies were established and were in regular communication with Britain, and the presence of missionaries and other Europeans

in Aotearoa had created a need for communication systems with those South Pacific islands.

It has been said that:

By 1831, the number of inhabitants at Kororareka was sufficient to warrant steps being taken to provide some regular postal communication with Sydney, and a Mr Powditch...a friend of the Postmaster General of New South Wales was commissioned to receive and make up mails on the latter's behalf at the Bay of Islands.²²⁹

The 1930s survey of the history of New Zealand postage stamps, edited by R. J. G. Collins and C.W. Watts, gives an account of the early history. (Literature Review: 32.) It was the arrival of William Hobson at the Bay of Islands in 1840 that saw the establishment of the first official post office in the New Zealand colony, with the cost of a letter to Sydney at that time being set at 4d. The cost the other way, from Sydney, was 3d, but an extra 4d surtax was charged on arrival. In the same year, the opening of post offices at Port Nicholson, Auckland, Coromandel Harbour, Hokianga and Waimate led to the subsequent establishment of inland postal routes, "the first post-route of any importance...[being that] between Wellington and Wanganui in 1841."²³⁰ At the time the inland as well as the overseas post was both intermittent and slow, with for instance, the post between Auckland and Wellington taking around three weeks. In those early days, before postage stamps were required or issued in the colony, the amount of postage due was marked on a letter, sometimes with printer's type:

Prior to the obligatory use of postage stamps for the prepayment of postage on inland correspondence in 1862, and before the issue of stamps in 1855, letters upon which the postage was due to be collected on delivery were marked with a large figure, in manuscript or impressed from type, indicating the amount to be collected.²³¹

The use of affixed stamps began in Britain in 1840 with the printing of the 'Penny Black', the first postage stamp in the world. It was "printed intaglio from steel, but since then stamps have been produced by all the main printing methods."²³² By the early eighteenth fifties, when the issue of postage stamps for New Zealand was being considered, initial enquires showed that at the time there was no-one in Auckland with the printing capability to produce such items by the intaglio processes used in Britain. Further investigation showed that although a single Sydney engraver, a Mr Carmichael, was capable of such work, he was at the time engaged in transferring his work from copper to steel plate engraving, and the New South Wales Colonial Secretary advised that there would be a delay. In view of this, and in order to ensure quality engraving it was decided to have the plates for the New Zealand stamps prepared in England, and the Colonial Agent in London was instructed "to take the necessary steps for the production of the plates and of the initial supply of the stamps."²³³ Thus it was that in 1854 the printing of the first New Zealand

stamps was accomplished in England. All were printed in colour: a single colour was used for each.

After completion of the work, the printer, Perkins, Bacon & Co., who were the printers of the original 'Penny Black'²³⁴ and to whom the contract had been let, dispatched the order to Wellington on the *Simlah*, whence it went to Auckland on the *Nelson*. An accompanying invoice²³⁵ (reproduced below) gave details of costs of supplies, including of the coloured inks and of the printing press sent out with the plates for subsequent local printing, although, according to Collins and Watts, the "press was left in the Custom House for six years before it was set up and used."²³⁶

1854

26 Sep.	One case containing 3 steel Postage plates, "One Penny, Two Pence & One Shilling," respectively, each containing 240 labels.			
	125 each	£375	0	0
	50 sheets 240 each 12,000 One Penny			
	275 " 240 " 66,000 Two penny			
	33 $\frac{1}{3}$ " 240 " 8,000 One Shilling			
	<hr/>			
	358 $\frac{1}{3}$ " 86,000 Postage labels			
	complete, 1/- per 1,000		4	6 0
	6 reams watermarked paper, 18/- per 1,000		5	8 0
	36 Brass cancel stamps 1-36 @ 2/6		4	10 0
	50 lbs. cancelling ink, boxes etc. and packing cases.			
	One skeleton case containing			
	One cask 50 lbs. lake colour for One Penny stamps, 6/-		15	0 0
	1 cask 40lbs. green colour for One shilling, 3/-		6	0 0
	1 cask containing 250 lbs. blue colour for Twopenny stamp, 1/6		18	15 0
	Oil, 12 gals. Gum, 2cwt.			
	One Perkins' large size iron printing press complete		65	0 0

A detailed account of the intaglio method of stamp printing is given in Collins and Watts, where the stages are traced from the originally engraved die, for instance of the Queen's head (negative), through the stage of transference to a transfer roller (positive) and then to a soft steel die (negative) on which was added the background design, and then via another transfer roller (positive) to flat dies (negative). After approval of the die, to which the value was added, the final transfer was to the printing plate (negative). It had been Jacob Perkins, the founder of Perkins, Bacon & Co., who had developed the process in which the design was replicated several times on to a printing plate to make possible "the use of the intaglio or recess method for the production of stamps."²³⁷ After the initial English stamps were

issued in New Zealand, further stamps were locally printed in Auckland by J. Richardson from the English plates, as reported in a letter cited by Collins and Watts which also states that he used his own press, colours and gum. The government supplied the paper, blanketing, "and a stone to rub down the colours on as he has not these articles, and cannot purchase them here."²³⁸ The last statement indicates that at that time, printing with coloured inks would have been a rarity in New Zealand. By December 1855 just over 29,000 1d stamps of good quality had been printed locally:

In regard to the colour of the ink, it is clear that Richardson was a printer of some experience—the general excellence of the stamps produced attest to this...²³⁹

However, the stamps printed in England and locally in Auckland were not identical, and it was the difference in colours that was considered to have been the major distinction between them. The ink colours used for printing the stamps at the English firm were described as:

for the 1d. value...a deep red...with a distinct carmine tint...
for the 2d. value...a full blue colour with slight traces of a greenish tint...[and]
the colour of the 1s. is correctly described as yellow-green.²⁴⁰

The ink used by Richardson apparently had not been from London, and in addition, variations in colour and thickness of the paper he used, which had not been the same as that used in England had also contributed to colour differences. These are explained in detail in Collins and Watts, who state that examination of the stamps has also shown that at least some of the paper supplied by the government had been sourced in London by their supplier W.C. Wilson, and some in Melbourne. Chemical interaction between paper and ink, partly attributable to the extent to which the paper had been dampened, had caused a blueing effect in the English stamps, but the use in New Zealand of a blue paper of varying shades for some of the stamps further complicated discernable colour differences. The colours of all the stamps were variously affected by such differences:

The 1d. value was printed in red, and the shade varies, but the difference is due principally to the differences in the underlying tint of the paper itself and to the quantity of ink used.

A blue ink was employed for the 2d. value, and though some of the variation in this value is again attributable to the paper and to the quantity of ink, there was some variation in the shade of the ink as well.

The 1s. was printed in green, and such variations as occur were due to the paper and the quantity of ink.²⁴¹

The philatelic interest in stamp variations has in this case thrown light upon some of the difficulties the early colonial printers experienced in achieving standardisation even for single colour printing, and such time consuming difficulties added to the costs. For J. Richardson, a major problem had been that the paper with which he had been supplied (double foolscap) did not fit the plate. For such reasons, production expenses, not only for materials but also for labour had been greater than anticipated, and after the first printing of

the 1d stamps, Richardson found it necessary to increase his charges to the Government.²⁴² Reprinting from the English plates was carried out for several years, although, due to the wear of the plates the quality gradually dropped, especially for the high use values. By 1865, the plate for the 2d stamp had needed replacing, although the penny stamp plate was used until 1873, and that for the 1s until 1871. In the late fifties and early sixties, other denominations had been instigated; a red-brown 6d in 1859 (singled out by philatelists for its general excellence), a light blue and lilac 3d in 1862; and a black 4d in 1863, the year after the use of postage stamps to enable the pre-payment of all postage had become obligatory. To improve wearing quality the postage stamp plates began to be produced in steel, as seen from the itemised 1862 invoice from Perkins, Bacon & Co: "1862 July 24 One engraved steel plate containing 240 3d. Postage stamps...£125 0 0."²⁴³

It had been in December 1866 that the Government Printing Office commenced stamp printing when the Stamp Printing Branch was established, over four years after it had become compulsory to use stamps on mail in New Zealand, from April 1862.²⁴⁴ W.A. Glue states that the first stamps issued from the new branch were duty stamps, and that at that time printing was by an intaglio process:

they were first printed by the copperplate process. The same dies were used for all denominations, from 1d. to £10, the values being impressed on the face of the stamps in type in different coloured inks for each denomination. Originally there were about 60 different values of duty stamps, but the number was considerably reduced when it was found that many of the denominations were never used.²⁴⁵

A few months later, in June 1867, postage-stamp printing also began with the transfer to the new Stamp Printing Branch of the Postmaster-General's staff postage-stamp printer, John Davies, who, on the recommendation of Perkins, Bacon & Co. had been appointed from England in 1862, and who continued as Government Stamp Printer until his death in 1889. Just before Davies' appointment, a move to printing stamps lithographically had been mooted, but because, when asked, Perkins and Bacon submitted "a verbal report ... deprecating the adoption of the lithographic method," and because the intaglio press originally sent out in 1854 was still available for use, the decision was made to appoint an intaglio stamp printer. It appears that Davies had commenced work after an arrangement for the early termination of Richardson's contract had been reached, and that at that time further supplies of coloured inks were ordered to be sent out for the purposes of postage stamp printing.

In 1871, it had been necessary to alter the colours for the printing of the 1d, 2d, and 6d values of the New Zealand postage stamps because the action of sulphur in the air at both Rotorua and Hanmer was causing the colours to change, so that for instance, the colour of

the penny stamp had begun to resemble that of the sixpenny. Other colour variations in earlier stamps printed by Davies were thought to probably have been caused by the fact that mixtures of inks were made locally: possibly inks from elsewhere had been mixed with the imported English inks, and possibly some inks sent out in previous years had been mixed in with those that had arrived later.²⁴⁶ For instance Collins and Watts reported that the colour of the 1d stamps that had been printed by Davies

varied as to the orange content, the amount progressively becoming less until the stamps appeared in a true vermilion. In 1863 there was a small printing in a full carmine shade and these stamps are occasionally mistaken for London prints, but the tone was not so deep and, except in instances where the plate had been inked too heavily, slight wearing is to be noted.²⁴⁷

Such wear was also a cause for the inadvertent introduction of colour variations because of the appearance of white patches. Increased demand for stamps in the sixties due both to the gold-rushes and to obligatory use of stamps for the payment of postage had led to increased wear and tear on the plates as required production outputs had increased. Eventually, in 1873, new plates were needed and an order had been placed with De La Rue and Company in London for replacement plates. Meanwhile, in 1872, it had been decided to reduce the 1d. charge that had been made since 1867 on newspaper postage from the 1d. to a halfpenny, and for this purpose a new stamp had been needed quickly. John Davies, who had been made responsible for its production, took action to speed up the process. As Australian made dies had already been used for the printing of the duty stamps, it was decided to base the design for the new halfpenny stamp on the the British halfpenny, have the die cut on woodblock in Melbourne, and produce an electrotpe plate in the Government Printing Office.

Accordingly, the halfpenny stamps were printed by "surface printing" in a pale rose ink, and first issued in January 1873.²⁴⁸ This move set a precedent for the later use of a similar process to print the other postage stamps, as the 1873 order was this time for sets of electrotyped plates, that, when they arrived to supplant the old plates, not only enabled a trebling of production,²⁴⁹ but also appear to have marked the change to "surface printing" of the new issue, for which the head of the queen was now in profile rather than in the full-face image that had depicted a younger queen in earlier years. John Davies indicated that the new plates would require a different type of paper. He said:

As we had sufficient watermarked paper in stock to last this time, no more was ordered, as a rough-faced paper suitable for steel plates will not do for surface printing.²⁵⁰

Although 'surface printing' is today considered an alternative term for planographic printing,²⁵¹ according to Collins and Watts, John Davies was referring to relief printing:

When the Agent-General was instructed in 1871 to procure a set of six new plates, he was informed that if steel intaglio plates were ordered, new machinery would have to be procured; but that facilities existed for

surface-printing...the use of surface-printing by Great Britain influenced the Agent-General...in dies for surface-printing, instead of the lines that are to be produced in colour being cut into the steel as in the line-engraving or intaglio process, the printing parts are left standing and it is the portion of the design that appears uncoloured in the stamp that is cut away...at the time when the replacement of the full-face plates was being considered, surface-printing or typography was quicker and consequently less expensive than the use of intaglio plates. The chief disadvantage of the surface-printing method is that intricacy of design and beauty of production is not possible to the same extent as with intaglio plates.²⁵²

The new method had been deemed satisfactory, as had the dies that had been cut in Wellington by Bock and Cousins in 1878 for a red 2s. stamp and a deep grey 5s. stamp that had been similarly printed in 1878, thus proving that stamp production of a satisfactory standard could now be entirely locally achieved. Bock and Cousins were again asked to cut the dies for new stamps which were printed using electrotyped plates which were issued in 1882, although it was found that the locally produced plates did not wear as well as the British plates. The coloured inks had again been supplied mainly from De la Rue in England. By 1890, it was reported that "a new printing office for the stamp printer is to be erected in Wellington."²⁵³

New Zealand Pictorial Postage Stamps in Colour

In 1894, it had been decided by Cabinet that there should be a new issue of New Zealand postage stamps of most denominations, and a circular to advertise a competition for their design was ordered by the Post-Master General, who put Mr Gray, the Secretary to the General Post Office, in charge of producing the draft. By that time, the Government Printer felt that New Zealand stamps were being printed to a high standard. In 1890, with new machines, stamp outputs had been greater than ever before, and also in that year Henry Hume had taken over as Stamp Printer; George Didsbury reportedly had remarked proudly that he considered some of Hume's work was "admittedly superior to many of the stamp productions of the sister colonies."²⁵⁴ There had been a suggestion from a Melbourne artist, a Mr Luke, that it would be advantageous for New Zealand to use postage stamp graphics to advertise the attractions of the country's natural scenery. The original intention had been to have the new stamps in a more traditional style, bearing the Queen's head, but due to the omission of this requirement from one of the drafts for the circular, the information advertised in the New Zealand Gazette concerning the competition mentioned only that preference would be given to entries depicting "a scene or event characteristic of New Zealand."²⁵⁵ Thus it was due to an error that in the end the Queen's portrait was omitted and the issue became entirely 'pictorial'.

In his biography of Alfred Ernest Cousins, Marcel Stanley recounts that Wellingtonians William Bock and Alfred Cousins both had submitted entries for the stamp competition, and

some entries were also submitted from Australia. In the original designs the colour was from the hand of the artists. The Board of Examiners reported in 1895 that:

No complete set being uniformly of the greatest merit, it had been decided to divide the first and second prizes among the designers of twenty-two of the best drawings, in addition to which a third series was selected for honourable mention.²⁵⁶

William Bock won seven prizes and Alfred Cousins two, while three other Wellington contestants won ten prizes between them. Three prizes went to A.W. Jones of Christchurch, two to H.W. Young of Auckland, and five to two Melbourne contestants, E.T. Luke and E.H. Howard. Of the selections finally approved for printing by a board of experts, some came from both sides of the Tasman. Four of the chosen designs were by William Bock (for the 2d, 3d, 9d, and 1s), one by Mr Gant, also of Wellington (for the 1d), and one by Mr Young of Auckland (for the $\frac{1}{2}$ d). The remaining seven stamps selected were designed by the Melbourne men, Mr Howard, (4d, 6d, 8d), and Mr Luke, ($2\frac{1}{2}$ d, 5d, 2d, 5s). However, in the end, neither of Alfred Cousins' award-winning designs was used for actual printing. (Plate 58.)

It was decided the printing should be done in England. The reason was reported by Marcel Stanley to have been that the designs were considered to be "so excellent that the engraving should be entrusted to only the best engravers..."²⁵⁷ However, Collins and Watts mentioned that the specifications reflected the fact that the original intention had been to print them in Wellington, and therefore stipulated that "the dies are to be engraved on steel and adapted to letterpress printing..." However, the firm of De La Rue, to whom the chosen designs had been submitted, thought them unsuitable for relief printing, but because the Government Printer was at that stage unhappy to sanction intaglio printing, the outcome was that "De La Rue refused to proceed further."²⁵⁸ After the designs had been given instead to Waterlows and specimen dies of the two types had been prepared for comparison, the Premier of the day, R.J. Seddon, who was in London at the time, had preferred the proof impressions taken from the intaglio plate. Accordingly, at that stage, Cabinet issued a memo, cited by Collins and Watts, recommending that the stamps be produced using the intaglio process.

Mr Gray had advised that, for a pictorial issue such as this, even though the cost would be higher, the bigger designs would be most suitable to the 'advertising' function intended. Up to that time, it appears that stamps had been printed predominantly in one colour in addition to black because of the high cost of colour printing, but even for the new issue only one stamp was selected for two colour printing: the fourpenny. Accordingly, the original specifications had laid down: "special care to be taken that the dies for the fourpenny

stamps (in two colours) be made to register correctly.”²⁵⁹ Thus in coming to a decision concerning the colour printing of the pictorial issue, cost as well as merit was very much a deciding factor, but conservatism also played a part. Mr Gray had attempted to stave off conservative caution by pointing out that “the question of cost is to be considered, but I would remind the Postmaster General that stamps with two or more colours are now by no means rare in other countries, and that the effect is excellent.” The pictorial stamps were finally issued on April 5th 1898 in both New Zealand and England (although in the latter place only for a few months) to market acclaim, particularly concerning the appearance of their colours, it being reported that:

they immediately found favour with the public and the pleasing designs and contrast of the brighter colours with those of the previous issue ensured their popularity.²⁶⁰

After the initial printing, it was provided that the plates should be sent back to New Zealand to become the property of the Stamp Office which would then be charged with decisions concerning any further engraving or printing required. New machinery was acquired, and was also used for subsequent printing of a new halfpenny stamp, known as the Mount Cook green. However, the English printers had ignored instructions regarding the denomination of the pictorials that was to be in two colours, and it was the 1d which had been so printed. Because its usage was far greater in comparison to the 4d (the least used), this increased the printing costs, and consequently, for the later printings, the designs of the 1d and the 4d were reversed, which explains why the colour images of these stamps seen in a postcard from the times shows the 4d in two colours, with the scene depicted on it, of Lake Taupo, matching that shown on the 1898 1d.²⁶¹ (See plate 59: 1.) In the catalogue for a recent 1995 exhibition that featured one of the 1898 New Zealand Pictorial Series stamps, Paul Fox has observed that because of the endless recycling of a particular view, often on a stamp, that familiar view gradually became the *only* well-known view of the depicted place, and that in this way, such an image sometimes became a “unifying icon of nation”.²⁶² Mass-produced images such as those that began circulating on the pictorial stamps from around the turn of the century onwards helped many New Zealand views to become famous. The design for a stamp that was featured in the 1995 exhibition, the 2d value by William Bock, incorporated a view of Pembroke Peak in Milford Sound—but one image of New Zealand

Plate 58: ‘A Photographic Reproduction of Alfred Cousin’s Hand-painted Entry for the 1895 Stamp Design Competition.’

Published in Marcel Stanley, Alfred Ernest Cousins, a Postage Stamp Die Engraver, Die Sinker, Medallist, Copper and Brass Plate Engraver: An Illustrated Biography (Whitcoulls, Wellington, 1980), [4].

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Ref. No.: B-K 534-4.

A photographic reproduction of Alfred Cousins' hand painted entry for the 1895 stamp design competition. The stamps were issued in 1898.

from the Pictorials that did indeed become a national icon.

Some Social Needs: Coloured Greetings Cards and Postcards

Greetings Cards

Besides the ephemeral items printed for the more public special occasions, many more were used by private citizens, for instance cards used to mark a religious festival such as Christmas, for a family occasion such as a birthday, or to post home from a holiday. As mentioned in chapter 8, before printing allowed such cards to be generally available in England to the mass market, at first they had been produced on a private basis. Michael Twyman states that “the first Christmas card is generally considered to have been a private one designed by J.C. Horsley for Henry Cole, one of the founders and the first director of the Victoria and Albert Museum, for Christmas in 1843,” and that “three years later Cole had one thousand copies printed lithographically and sold them at his own art shop in Bond Street.”²⁶³ According to Frank Staff, who does not make a distinction between the year of the first card and that of the edition of one thousand, apparently the colour on these early cards had been added by hand.²⁶⁴ Because Christmas in the northern hemisphere was a winter festival, it was natural that colour was employed to help brighten celebrations, and that part of this was the use of colour in the cards that began to be more widely produced for the exchange of Christmas greetings. Much information concerning their use and history has also been given by George Buday in his *History of the Christmas Card* (1954). By the eighteen fifties Christmas cards were being printed in colours in considerable numbers. Staff considers that it was the Penny Post that was responsible for the fact that by this time “the public demand for them was prodigious.”²⁶⁵ By the sixties, the sending of greetings cards at Christmas had become a fashionable custom; one that has lasted to the present day.

Along with other customs from ‘Home’, the New Zealand settlers had adopted the custom of sending greetings cards, and, as mentioned, some of the first New Zealand-produced cards were hand-produced by such artists as John Backhouse. By 1883, A.D. Willis was printing and advertising his colour-printed Christmas and New Year cards featuring New Zealand motifs. (See chapter 8). However, many of the Christmas and other greetings cards sent and received in New Zealand have always been printed overseas, especially in Britain or Germany. Writing in 1917, Robert Peddie suggested that the general excellence of German art printers over the preceeding twenty to thirty years had been perhaps due to the excellent technical training in that country: “the Germans have found some method of bringing together theory and practice—of harmonising artistic design with the mechanical trade.”²⁶⁶

In the period that A.D. Willis was both printing and publishing his chromolithographed cards, British chromolithographers were also increasingly turning to jobbing printing. Geoffrey Wakeman has said that in the last decades of the century only a few of the many colour printers at work made book illustrations, but by then some were combining such work with the printing of Christmas cards. One of these firms was Hildersheimer and Faulkner who by 1884 were combining the manufacture of Christmas cards with production of colour printed children's books.²⁶⁷ Some British-designed cards were also being colour printed in Germany, one nineteenth century example being an 1889 card 'The Day Star'. Consisting of several pages of poems decorated with small scenes and sprays of flowers in sepia lithography, and with chromolithographed cornflowers and English daisies on the front and a cornflower on the back, the booklet-style presentation was in this way similar to some cards later produced by A.D. Willis. Published in London by James E. Hawkins, 'The Day Star' stated "designed in England; printed in Germany," while on another, an 1892 post-card style Christmas card from the well-known publisher in the field, Raphael Tuck and Sons, was stated: "designed at the Studios in England and printed by the "Rafolith" Process at the fine art works in Saxony."²⁶⁸ For such cards R.C. Harding considered that, at the time, Raphael Tuck and Sons were the leading firm.²⁶⁹ Many cards from this era were chromolithographed, often small and 'fold-out' in style, perhaps with fancy edges or cut-out work. In the first two decades of the twentieth century, many colour printed Christmas cards finding their way to New Zealand by post continued to be produced in this way, some by quite elaborate chromolithography, for instance one from 1910 for which ten printings had been used, but for others the colour was being added via photomechanical means, for instance for a very small four colour half-tone of a steeped church printed on a booklet style card, one of the Union Jack Series, that was attributed to G. Delagado, and that was "Made in England" in 1910.²⁷⁰

A great many Christmas cards intended to be sold on the New Zealand market were being printed, not locally, but in Britain, for instance one printed in yellow, green, red and black that was thought to have been from the early twentieth century. Decorated with the New Zealand symbols of a fernleaf and a tiki, and with "NZ" and "Best Yule Tide Wishes"²⁷¹ in gold, such a card epitomised the hybrid nature of Antipodean cultures where many continued to identify with a winter festival, even though the season of celebration had, for them, been translated to high summer. In New Zealand A.D. Willis had seen a market opportunity for the local production of greetings cards, such as the Christmas and New Year cards which he accordingly had begun to produce and vigorously advertise every year. In

exclusively featuring the unique New Zealand scenery, flora and indigenous people, rather than the symbols of winter and of the Christmas of the northern hemisphere, Willis' cards were not only among the pioneering locally colour printed ephemera of this kind, but also were remarkably 'modern' in so breaking with traditional subject matter. However, the fact that overseas printers continued to dominate the market partly demonstrates the continuance of the cultural pattern established for books: the looking to British printers for colour work. As well, the fact that the Federation of the Australian States in 1901 did not include New Zealand appeared to somewhat loosen trans-Tasman ties. However, the cultural bond with Britain remained strong, and was reinforced by direct shipping routes to England that were increasingly economically important to New Zealand's trade with Britain, especially, as mentioned, for the export of dairy produce and refrigerated meat. Established transport routes such as these also facilitated the post.

Postcards

For more everyday use, colour-printed postcards had begun to be produced for the mass market in the late nineteenth century, their forerunners being such items as early pictorial visiting cards and ornamental trade cards. Following the advent of penny postage in 1840 in the British Isles, when it had become possible to use an envelope without incurring double postage, pictorial envelopes and writing paper had appeared in the fifties and sixties. Although forerunners of postcards have been noted as being the advertisement postcards that were granted copyright in America in 1861 to the private firm John P. Charlton,²⁷² the earliest known official issue of postcards was from the Austrian Postal Administration on October 1st, 1869.²⁷³ However, recently it was reported in a statement from the London Stamp Exchange in Britain that:

A postcard with a humorous drawing of postal clerks seated around a large inkwell fetched £31,000 (NZ\$104,061) at auction on Friday [8 March, 2002], a stamp dealership said. The postcard, which dates from 1840, is believed to be the world's oldest and also carries a rare Penny Black stamp.²⁷⁴

Michael Twyman considers that the passage of postcards into common and widespread usage was propelled by the success of a card bearing a lithographed image of the Eiffel Tower that apparently had caught the imagination of the public after it was placed on sale at the top of that French icon, from where it could also be posted during the Paris Exhibition of 1889.²⁷⁵ (See also chapter 8.) Applicable to the expression of similar "wish you were here" sentiments of those visiting other foreign and/or interesting places like the Eiffel Tower, through the rise of tourism, postcards began to fill a growing market niche, as both the sending and collection of postcards became a fashionable and popular trend, especially between 1895 and 1914. Twyman has stated: "in 1903 alone 600 million postcards passed through the hands of the Post Office."²⁷⁶

Although the initial introduction of the colour printed picture postcard by the Italian firm of Danesi, and also by some Swiss and Austrian printers had failed to catch on in the early eighties, after the debut of the Eiffel Tower card, it appears that the picture postcard's time in the marketplace had come, and by the early 1890s great numbers were being produced, first in one colour and then two, especially in Europe, where restrictions on postal cards were not as severe as in other countries such as Britain and America. Early restrictions in other countries had often proscribed the places to which postcards could be sent. In Great Britain for instance, where the first postcard, "designed, printed and published by Messrs. De la Rue and Company"²⁷⁷ had been on sale on October 1st 1870, it was prohibited for the postcard to be sent beyond national borders and to carry anything except "a brief message in the space provided."²⁷⁸ However, on the continent full colour post-cards were being produced by the mid-nineties, particularly in Germany where both colour printing and jobbing design standards were high—it had also been in Germany that much experimentation had taken place to further photomechanical tonal colour printing processes that were necessary to the fidelity of reproductive views. Frank Staff has suggested that the German capture of the postcard manufacturing market was partly driven by the marketing expertise of Jewish interests in Germany, so that German printers began to print postcards for sale in many countries, a trade that continued until World War I.

Germany was undoubtedly the centre of the picture postcard industry. Coloured picture postcards of places all over the world were printed in Berlin, and especially in Saxony and Bavaria. The business seems to have been largely controlled by Jewish interests, and they were undisputedly the exponents in the technique of colour printing of this sort. The Swiss were also producing excellent work, but they lacked the business initiative to market their knowledge, so that the Germans had the field all to themselves. The Germans established their agencies everywhere, and undercut all competitors.²⁷⁹

Regulations in Britain were spelt out in 1872 for private cards to be eligible for impression with a halfpenny stamp and had included the stipulation that "they must be white, *i.e.* not tinted in any way."²⁸⁰ In any case, British restrictions on size of postcards had not been conducive to pictorial treatment. Size restrictions had been lifted in Britain in 1894, after which the trend for sending and collecting postcards had mushroomed there also. As restrictions on private publication were from that time also abandoned, pictorial postcards immediately began to appear.²⁸¹ However, most publishers, including one of the largest, Raphael Tuck, used German printers. Some British printers had experimented with printing such cards, for instance the Scottish firm Valentines via collotype, and George Stewart and Co. with process blocks and lithography, and these had soon included three-colour postcards. In America, although private printers had been allowed to publish postcards since 1893, from which time coloured view cards had been available, by 1898 an Act of Congress had placed privately issued postcards on the same footing as Government postcards, and

after this the postcard vogue took hold there also.²⁸² German-printed postcards often featured views of landscapes and townscapes of the individual country in which they were sold, such subjects going hand-in-hand with the rising popularity of photography, and linking with the intent of the picture postcard to communicate a visual experience. As photo-journalism became a profession and the photographic image began to provide greater realism, postcards were increasingly produced photomechanically from photographs, although many others *were* photographs.

In New Zealand, postcards were in use in the colony at least by the late eighteen seventies, and could be posted in a limited way within Australasia, to the colonies of Victoria or South Australia, but not to other overseas places, as is evident from the information setting out rules and penalties concerning post cards in the 1878 *H.I. Jones' Wanganui Almanack*:

Penny Post Cards are now issued to the public, for transmission between places in the Colony of New Zealand, and also to certain other places, hereafter mentioned at letter rates.

The front or stamped side of the card is for the address only, and beyond the written or printed address, nothing whatever must be printed or written upon that side of the card. On the reverse side, any communication, whether of the nature of a letter or otherwise, may be printed or written. Nothing whatever may be attached to the card, nor may it be folded, cut, or otherwise altered. If any of the above conditions be infringed, the card shall be charged one penny on delivery.

An exception, however, has been made in the case of post cards used for receipt purposes, to the back of which a duty stamp may be affixed.

Any post card observed to bear upon it anything of an obscene, libellous, or obviously objectionable nature, will be detained and sent to the Dead Letter Office for disposal.

Post cards may be transmitted to the Colonies of Victoria and South Australia under the same conditions as they are transmitted within New Zealand, except that in addition to the impressed stamp they must have an extra penny stamp affixed to them.

All post cards addressed to other places out of New Zealand will be detained, and sent to the Dead Letter Office for disposal.²⁸³

As in Britain, especially in the early years of the postcard, many countries only permitted their use within defined borders. Although there had been a number of Postal Unions formed during the eighteen fifties and sixties, it had not been until 1875 that the first Congress was held, and that the International Postal Treaty that was adopted by the General Postal Union at that time had taken effect, allowing "postcards to be sent abroad between member countries at half the letter rate."²⁸⁴ New Zealand statistical information from the year 1882, when the estimated population was 517,707 (exclusive of the Maori population), shows that, in that year, 959,095 post-cards had been sent via the New Zealand postal system. Although comprising but a fraction of the 30,525,579 letters, the 2,396,255 books and parcels, and the 13,313,099 newspapers that were sent by post in the same year,²⁸⁵ it can be seen that postcards were already occupying a recognisable market share of the printed items being sold in the colony for this purpose.

As noted in chapter 8, the chromolithographed view post-cards printed by A.D. Willis in Wanganui that were being produced as a part of the tourist industry probably began to appear at the end of the eighteen-nineties, the same decade that had seen colour printed postcards in more common use in European countries, Britain and America. Around this time, pictorial lettercards were also being produced in New Zealand. An example that survives from 1900 is one that bore a design made up of various New Zealand views on the back, and that had been printed by the “ChCh Press Co” in purple ink on a cream background.²⁸⁶

However, as for many other colour-printed items, a great many postcards on the market in New Zealand, even those depicting New Zealand, were printed overseas, often in Germany, as were postcards intended for the Australian market at the time. It is interesting that New Zealand was one of the few countries for which pictorial postcards were printed in Britain—by the firm of Waterlow and Son,²⁸⁷ again in keeping with the strong cultural ties, and the leading part that had been played by that firm in the commercialisation of process colour in Britain. Original photographs used to print postcards photomechanically were often from local photographers, for instance, in Australia, the Sydney photographer Frank Hurley, who in 1911 became official photographer to Dr Douglas Mawson’s Antarctic Expedition, but who was also a professional postcard photographer recording Sydney cityscapes around the end of the first decade of the twentieth century.²⁸⁸

An attractively colour-printed postcard that also highlighted a New Zealand cityscape was one produced for the local market in 1906. (Plate 59, 1.) With the red New Zealand seal printed at the top centre, and featuring “P. Jervois Quay, Wellington N.Z.” as a central black and white image, the cityscape was surrounded on three sides by embossed images of the New Zealand stamps of the day, which, as seen above, were by then themselves mostly pictorial, and which, because they were embossed on the card, appeared very realistic. This card, marked “No 59”, was evidently one of a series. At the bottom right hand corner was printed “Protected Aug. 1st 1906 by Muir & Moodie, Dunedin, N.Z.,” a reference to the photo- graphic firm that was most likely responsible for the original photograph. On the address side were the statements “Made in Bavaria” and “ “Protected” New Zealand Postage Stamp Card”. The card had been printed by photolithography with the stamps in

Plate 59, 1: ‘P. Jervois Quay, Wellington, N.Z.’

New Zealand Postage Stamp Postcard: 9.1 x 13.8cm. “Protected Aug. 1st 1906 by Muir & Moodie, Dunedin, N.Z.” Colour photolithograph printed in Bavaria, 1906.

By permission of the Alexander Turnbull Library, Wellington, N.Z., Ephemera Collection.

Ref. No.: Eph-A-POSTCARDS-1906-01.

P. JERVOIS QUAY, WELLINGTON N. Z.

Protected Aug. 1st 1906 by Muir & Moodie, Dunedin, N. Z.

colour, from which it could also be seen that the card was showing off the New Zealand pictorial issue, and that the colouring was true to those stamps. Whereas most of the stamps were in one colour and white, the 4d stamp of the day, the two colour stamp, appeared as such: faithfully reproduced with a mountain and lake scene in navy blue in a white circular frame on a tan background, and with the lettering and decoration in white.²⁸⁹

A postcard surviving in the Alexander Turnbull Library, also from the first decade of the century was a forerunner of the foldout view type of postcard that became popular later in the twentieth century. Printed in Germany, this 'Pictorial Postage Album of Rotorua Views' contained a series of black and white views, probably collotyped, that folded out from the centre in a concertina fashion, but that were held shut with a metal catch. The view of the "Green and Blue Lakes" on the face, however, was in colour. This image appeared to have been printed with a collotype base, but with the colours blue, green and pink added on top, possibly from lithographic plates.²⁹⁰ More typical of the coloured pictorial postcards of the early twentieth century were those that were basically half-tones that were printed by relief or by photolithography to which coloured tints had been added very roughly by hand, or sometimes by lithographic means. One example, "W. Bentley & Co.'s Series No. 23", was a picture of the 'Wairau Falls' that had been tinted by hand in green and blue, and that, from the cancellation stamp, had been sent on 20th December 1905.

Examples of the chromolithographed postcards of the times were those that were locally printed by A.D. Willis. As mentioned, New Zealand views were again prominent among the images depicted when Willis began producing postcards, probably in the late nineties when Benoni White began to work for him. One that had been sent in 1908 that had been lithographed by Benoni White and issued by the "New Zealand Government Department Tourist and Health Resorts" depicted a view of 'Lake Rotorua, New Zealand' on the front, with Maori carvings as a border on three sides. On the address side, which was printed in the usual dark red, was another view, 'Mt. Earnslaw, Head of Lake Whakatipu', again with decorative Maori carvings. At the bottom appeared "W.R. Bock, S^c" and "A.D. Willis, Imp". From around the same time was a card designated "New Zealand POST CARD" that was from the "Industries Series." Post-marked 17th November, 1910, it had been printed overseas in Germany for "Fergusson Limited, Sydney and London. No. F. 35" although bearing a local photographic image—"Maoris Cooking Breakfast in Hot Springs, Whakarewarewa". This card had been printed as a basic collotype to which neutrals and a few bright colours had been added, probably by means of lithography, to simulate a coloured photograph.²⁹¹ Many postcards of the times depicted Maori themes, and were often,

in keeping with both the popularity of portraiture and the thriving tourist industry, portraits of Maori guides, sometimes presented in colour. Many Maori portraits were published by such firms as Muir and Moodie, of Dunedin, New Zealand, the Wilson Photo Post Card Company Studios in Auckland and Fergusson Limited of New Zealand, Sydney and London, some from original photographs by well-known New Zealand photographers such as Alfred Burton and Herbert Deveril. As for other postcards, many of these were printed in Germany.²⁹²

In the early years of the twentieth century, the demand for coloured postcards was such that, before colour photography was possible, many means were being explored as part of the quest to add quick colour to a basic image printed in black and white in order to achieve the appearance of a colour photograph, and clearly such practice was being applied to postcards. (Plate 59, 2.) As a result, standards of colouring varied greatly, and even some of the overseas postcards at this time had been very roughly coloured, often garishly, in the attempt to meet market expectations but without adding too much to production costs. By this time many postcards were beginning to be of a similar size and style, often with the basic image produced by photolithographic means. Dated as having been posted on 1st March 1907, one such item published by Raphael Tuck that was called a "Real Photograph Post Card" was a picture portrait that was a very hastily hand-coloured production.²⁹³ Towards the end of the period, it was apparent that colour printing for such items as postcards was tending towards more standardised photomechanical production methods. Subjects depicted were also changing, with humour more often chosen as an element. One from around the beginning of the second decade of the twentieth century was a photolithographed colour postcard bearing the text "having a ripping time in Wellington" beneath a seaside image showing holidaymakers' efforts to extract a man's trousers from the mouth of a donkey.²⁹⁴

Plate 59, 2:

A. 'Waiting the Arrival of the Steamer, Queens Wharf, Wellington, N.Z.'

Postcard, 9.1 x 13.8 cm. Industria Series, No. 1007

Colour photolithograph published by Fergusson Limited, Sydney and London.

B. 'Wellington. N.Z. Parliament Houses.'

Tuck's Post Card, 'Oilette': 9.1 x 13.8 cm. 'Wide-Wide-World Series' 7334.

Four colour process print from and original by A.H. Fullwood.

"Processed in Bavaria", published by Raphael Tuck & Sons.

C. 'Victoria College, Wellington.'

New Zealand Post Card, 9.1 x 13.8 cm. G. & G. Series, No. 112.

Colour photolithograph printed in Berlin.

Waiting the arrival of the Steamer, Queens Wharf, Wellington, N. Z.

WELLINGTON - N.Z.
PARLIAMENT HOUSES.

Victoria College Wellington

However, view postcards remained popular. One which had been used on May 1st 1913 to send a quick message before the sender was due to “hurry off to work” was the Muir and Moodie ‘General View of Wellington from Thorndon. N.Z.’ which included the picture frame around the edge of the view. Printed in Bavaria, it was a photographic image that had been chromolithgraphically coloured using prepared tints.²⁹⁵ As three and four colour process printing was beginning to take over in other print areas as well, even in outposts such as New Zealand, it was also being used for the colour printing of postcards. An example that had been locally printed in 1915 by the “Brett Printing and Publishing Company in Auckland” was the postcard entitled ‘Maori Belle Putika. (N Z.)’.²⁹⁶ This item had been printed using the four-colour process that was to become the standard printing method for such picture post cards after the middle of the twentieth century.²⁹⁷

Response to Question 6

New Zealand Colour Print Products

Near the end of the twentieth century, it was said of the book-trade in New Zealand that “until surprisingly recently, especially among older people, Britain remained ‘Home’ and it was the source of most of the books bought, read and borrowed in New Zealand’s cities and towns.”²⁹⁸ It was to be expected that tastes, including tastes in illustration and book format, were shaped accordingly. Conventions for local printing and publishing were based upon concepts that had been inherited from the Old World, and which came to New Zealand via several routes, particularly via Britain. It is not surprising that similar print product formats were provided to the market in both Britain and New Zealand, but the way in which printers adapted to market conditions were driven by complex factors, some of which were local, some universal and others driven by technical considerations. It is a truism that for the small New Zealand printing industry, competition from larger overseas enterprises has been inherently unequal, so that books that were published here were more likely to have been those which were pertinent to the local setting, and therefore directed at least partially to the local market.

Before about 1938, the trade for books, specifically, within this country was heavily dominated by British publishers, so that relatively few were printed locally, and those mainly in niche areas (school books and readers, cookery, gardening, local histories, directories, official publications, and so forth.)²⁹⁹

As evidence in Section V has shown, books such as these were sometimes vehicles for local printers wishing to bring colour to the marketplace of print, and colour printing had occasionally been employed for more specialised locally printed books directed towards the wider Australasian market, for instance *Whitcombe’s Story Books*, and sometimes was directed also back to the British market, as in the case of Edward Wakefield’s *New Zealand*

Illustrated. Other genres for which New Zealand colour printers had provided colour included maps and prints, some of these items having been produced to accompany books and reports from the early years of colour printing capability. In the colonial situation, maps had been a genre for which there had been an early need, and for which colour printing had been found a useful tool. However, compared with print products appearing from the British printers of the period, relatively few colour printed books, maps and prints were being produced by local New Zealand printers over the study period.

It was the production of other less substantial genre that came from the jobbing activities often associated with the newspaper offices that has been seen to have provided an opportunity for the local colour printer. In the colonial printing environment where the newspaper was fulfilling an important need, such smaller scale work commonly provided a viable business option. Firms associated with general printing and with other book trade activities of bookselling and stationery manufacture had also often developed a colour printing capability, for instance, examples of lower North Island printers were A.D. Willis, H.I. Jones and Lyon and Blair. Those with particular lithographic expertise such as the Wellington printers Bock and Cousins, Brown Thomson and Co. (Robert Burrett), and the Government Printer all had found occasion to bring colour to the market in a range of print products, the latter especially in the form of maps and plans. As evidenced in this section, other than colour printed book illustrations, prints and maps, other colour products to emanate from local firms such as these included the land sale plans, posters, advertisements, programmes, tickets, invitations, certificates, catalogues, food labels, calendars, stamps, greetings cards and post cards that were printed for practical purposes. However, that specialised class, the banknote, was a category that had rarely been produced in colour by local New Zealand printers.

From the genre study presented in chapter 10, it has been seen that, in New Zealand, it had been in keeping with the popularity of the newspaper that colour printed special numbers produced in conjunction with the weeklies had been presented to the market. The success of these supplements was partly attributable to the introduction of the element of colour, a feature that after the late eighties had begun a regular appearance and that had been continued and expanded. Consequently, over the last twenty-five years of the study period colour printers had been active in newspaper firms especially in all the main centres (but also in smaller towns) producing supplements of this kind. Some of the major firms were Wilson & Horton and Henry Brett in Auckland, the Wellington firms of the New Zealand Mail and the Evening Post, the Offices of the Press and the Canterbury Times in

Christchurch and the Otago Witness Office in Dunedin. For such undertakings, the laborious colour work was often contracted out, for instance, around the turn of the twentieth century Wilkie and Co. had been engaged to lithograph the *Otago Witness* Christmas number. As seen in detail in the case of Wilson & Horton in Auckland, large newspaper firms typically possessed jobbing departments from which had emanated occasional book titles, periodicals and almanacs that sometimes had incorporated colour illustration as well as a host of colour printed ephemeral items.

Many of these colour printed items were of a similar format to those produced in Britain, although, as discussed in section III, in New Zealand the means of production was mainly confined to letterpress or lithographic means. Over the study period, it has been seen that tint lithography and chromolithography was most often the process employed for locally printed colour graphics, although by the early twentieth century three and four colour processes were increasingly the means by which local colour printers were bringing colour to the New Zealand marketplace of print.

Major differences between the British and the New Zealand markets were mainly attributable to geographic, technical and cultural factors. The remote New Zealand location and small population did not afford New Zealand colour printers the economy of scale that were open to their British counterparts and, in general, colour printing technology available to British printers was typically ahead of what the colonial printers could employ in any given era. Over time, it was true that the decreasing technological gap was ameliorating such disadvantage, and that in the case of map production, where official need had played a part, access to up-to-date technology had been a facilitating factor. However, the disadvantages of geography and technology had in general reinforced the New Zealand cultural tendency, especially at first, to look to Britain to fulfil colonial colour printing needs. Along with many other imported commodities, the books and other print products from Britain that had initially provided a cultural bridge continued to be desired by the local market throughout the period under study and beyond, and consequently were enduring competitors on the local market.

Although from the eighteen eighties more books with local content were being printed and published in New Zealand, a major difference was that the larger and growing nineteenth century mass marketplace provided a far greater opportunity to the northern hemisphere British printers for the production of coloured books than was open to their colonial counterparts. For New Zealand printers it has been seen that business prudence had been

especially necessary in relation to the production of colour printed books, a condition that has been exemplified through the portrayal of the experiences of lower North Island printers Bock and Cousins and A.D. Willis regarding this genre. The case study of the latter has shown that in spite of the fact that Willis had specialised in colour printing and had brought colour printed products of nearly every genre except the newspaper to the marketplace, nevertheless he had shown caution with regard to ongoing costly coloured book production: even for this printer it had been the ephemeral colour print products that had provided a more continuing local market share. In the case of Bock and Cousins, who had been able to complete only one of the three envisaged volumes of the chromolithographed Featons' *Art Album*, the production of that volume alone had brought financial problems to both the instigators of the project and its local printers.

Market Drivers

Although the colour print products produced in Britain and New Zealand differed both in overall quantity and in the proportions of the genre that were produced, similarities as to market drivers can be discerned. It has been seen that in the nineteenth century the expectation and demand for colour, especially as an element in graphics printing, was a market pressure that was increasingly being fulfilled in both these places. As colour printing technology advanced, new opportunities for printers had appeared and were taken up as appropriate to the respective markets. However, it has been evident that important market drivers were also provided by local factors, these particular conditions creating some differences that will be discussed below.

Global Drivers

The General Public as a Market Segment

The general market desire for graphics had quickened in the nineteenth century, a trend that included the appetite for coloured images. As technology had provided more affordable means for printers to satisfy that demand, the ability to supply the mass market with colour had become more possible and had fed further expectation. Consequently, the general market was acting as a pressure towards the further provision of colour in print products. Although overall smaller population size was a limiting condition in the New Zealand market, colonial printers found appropriate ways to use the technologies at their disposal to bring colour to the general public in the many smaller items for everyday use produced from jobbing printing. The need for such print products meant that the practical became a considerable local market driver, one that was also present in Britain as printers increasingly discerned a market niche for many a colour printed ephemeral item.

It has been seen that the special issues of the weeklies in New Zealand, mainly the annual Christmas numbers, contained colour printed images that had been marketed particularly to a general readership—nearly all of those examined fell into this category. Similar genre had been so marketed also in Britain. However, the larger market and the more developed colour printing industry in the parent culture had also allowed a trade in more substantial books for special occasions to develop in Britain where for instance the annual Christmas market was an obvious season for such trade in more elaborately coloured books.

It has been said by S.W. Bradley that “on the one hand the press is an economic unit of production within the capitalist mode; on the other, the press has, by and large, reflected and reinforced the values of the system in which it was a part.”³⁰⁰ A difference that developed between the productions of the press in Australasia and Britain is that the Antipodean market in the period under study did not support the sale of ‘quality’ papers such as the *Times*, as distinguished from the popular papers appealing mainly to the mass market. Although a given population may consist of various groups, each with differing characteristics, “a newspaper which aims at a mass circulation is compelled to find out what will suit the greatest number of publics, and adapt to suit them all.”³⁰¹ Whereas in Britain the wider market had resulted in a greater spectrum of such print products, in New Zealand, it was through the popular newspaper weeklies that the drive to secure the mass readership was chiefly conducted, and consequently, in order to build circulation, it was to this market that colour effort was increasingly directed, especially through the Christmas numbers.

In the quest to appeal to diverse groups, not only to local town and country readers but also to readers overseas to whom it was expected that many issues would be posted, variety of content had been an important factor, not least on the graphics side. As these annuals had tried to be all things to all people, it was clear that what the general public had wanted was pictures, whether historical, reflective of people, places, or events; of people at play or at work; the sentimental or the celebratory; the exotic or the patriotic. The desire for images and other graphics in black and white naturally had led on to the desire for coloured graphics. The evidence of chapter 10 has shown that from around the decade of the eighteen nineties onwards, New Zealand printers throughout the country had endeavoured to meet such demand in diverse ways.

Tourism, Children's Books, The Natural Environment

In both places, the second half of the nineteenth century was the period in which items such as Christmas and other greetings cards, and later, postcards began to be colour printed for

mass distribution, the latter especially in response to the general rise of tourism. The tourist industry had also provided occasion for many other excursions into colour printing as a demand for associated products such as posters, maps, tickets and booklets had arisen. In Britain, the demand for children's books had provided colour printers with a new market segment, and cheaper production methods had been employed to provide such items as the story, gift and toy books, although in New Zealand, local printers had not generally found such illustrative colour production a viable business prospect. However, by 1884 Whitcombe and Tombs had begun to produce selected school-books with colour added from the press and within the period under study Whitcombes' Story Books had appeared with colour printed wrappers. As part of a testing of the general market for colour printed products, A.D. Willis had made a preliminary foray into colour printed children's books by the early 1890s.

As well as being a focus for nineteenth century scientific investigation, as a subject, the natural environment and its appearance had been of growing popular interest, both aspects providing subject matter especially conducive to colour printing in the parent as well as the colonial print cultures. It has been seen that rather than in the local setting, most colour printed books and prints portraying the colours of New Zealand plants, animals and indigenous peoples had been printed in Britain. Although the appearance (both in 1889) of the colour printed books, Featon's *Art Album* and Wakefield's *New Zealand Illustrated* was atypical as far as New Zealand colour printing was concerned, both had been marketed with a general readership in mind. A.D. Willis, ever sensitive to public opinion, had mentioned in the preface to the book that he hoped the publication would "possess sufficient merit to receive public approval." For the latter book Willis had already primed and tested the market through provision in preceeding years of many of the plates as separate townscape prints. However, although Willis advertised widely, took trouble to marshall suitable expertise and equipment, was an astute market judge and had demonstrated high standards of book production, other coloured books from this firm had been more modestly produced. In the case of the *Art Album*, it appears that sufficient subscriptions may not have been obtained before such a costly production had been begun. It had not been so much deficiencies in local colour printing standards that had been the waterloo, but rather it appears that financial barriers had permanently obstructed the completion of the project. Both these publications represented graphic effort and business risk on the part of the colonial printers, and were indicative of the fact that the New Zealand market, although similar to that in Britain in its demands, in general was not able to sustain the local

production of expensive coloured books in the period. Although coloured graphics had occasionally appeared in the locally published almanacs, directories and yearbooks that fulfilled the wider market need for all kinds of local information, apart from inserted coloured maps, printed colour in such publications had also been of a modest nature.

Colour Was Itself a Market Driver

The fact that nineteenth century scientific investigation had included the study of colour as a subject in itself had fuelled a growing taste for colour, and resulting publications, such as Chevreul's 1839 treatise had been influential. Coupled with associated technological advances that enabled printers to better fulfil such taste, print products of all kinds had begun to be visually enriched with colour. Later in the nineteenth century, European artistic endeavour in particular had also promoted colour, while in the northern hemisphere centres of mapping excellence, the advantage of the inherent informational value of colour had been incorporated into the gradual standardisation of mapping symbols. Because maps were often hung, they were potentially desirable as decorative objects, hence for these items colour from the press was sometimes used as a decorative element. Although New Zealand printers could not match the variety of genre produced in Britain, nevertheless colour from the local press had appeared to tempt the market in a multitude of ways, not least as seen associated with the newspaper weeklies, but also as applied by printers in the course of general jobbing printing, and seen in items such as decorative certificates, invitations, programmes and calendars that emanated from printing firms in the increasingly varied forms that were discussed in chapter 11.

Before the introduction of colour within the special issues of the New Zealand weekly newspapers, the pictorial element had been used as a marketing tool to increase circulation through the offer of special and/or novel features, often pre-advertised, to draw the readership. For the annual Christmas numbers, advertisement was routinely used as a pre-selling device and orders were taken. It has been seen in chapter 10 that when colour was introduced, it had soon been given prominence to gain maximum attention, typically on the front cover or in a supplement, and that after a first appearance, thereafter had been regularly forward-advertised and presented as an annual treat. Consequently colour as a regular feature of the pictorial supplements became a popular element and was a definite market driver. Both before and after the introduction of colour into the special supplements the weeklies had been marketed competitively, and the employment of the latest graphic processes became a selling point to entice the customer. It can be said that in this way colour printing in New Zealand had a part to play in the shaping of the national psyche.

Many of the prints so circulated were destined to be hung on colonial walls, fulfilling a similar function that, for instance, Baxter's prints had done earlier that century in Britain where a demand for reproductive prints had long been cultivated, in particular for prints of paintings from the old masters. The production of colour in conjunction with the weeklies had to be financed largely from revenue brought in from advertising, and as always this was also heavily dependent on increasing circulation. Gradually it became true that it was particularly the larger firms such as Wilson and Horton which had acquired larger circulations that could afford such production.

Advertising

It has been said that the selling of products for the mass market is necessarily accompanied by mass marketing, of which advertising is an important part.³⁰² Some of the advertisements carried in these periodicals were themselves in printed colour, and would have cost more to place, thus advertising itself acted as a market driver for colour both because of its greater advertising impact and by bringing in extra revenue. (See Plate 46.) The increasing use of colour for advertisement was evident in many other print products such as in the posters, catalogues, food labels, programmes, and land sale plans of the period.

Decoration

As a decorative tool the element of printed colour had been introduced by New Zealand colour printers as they followed northern hemisphere trends. Especially towards the end of the nineteenth century, local colour of this sort had appeared mostly in ephemeral items for everyday use, such as in cards, posters, catalogues and food labels, but was also seen in title-pages for books and periodicals. Although nothing had appeared from New Zealand colour printers to match the decorative books, for instance those printed in Britain by the Chiswick Press, colour had occasionally featured in locally published letterpress title pages, for instance those in *Typo*.

Information

Particularly as part of the effort to produce colour printed maps locally, New Zealand printers had endeavoured to use colour in a lexivisual way to assist the general cause of environmental documentation. As a visual element of truth, colour had been used and found informationally advantageous to scientific publication. Its employment in this cause was in evidence both in Britain and New Zealand, the precedent in relation to the latter set by voyagers in the Southern Oceans before European settlement of the South Seas lands had begun. Because images brought back from explorations had stimulated the appetite of the

general readership, a continuing market segment for such exotic printed colour ensued as well, although in a limited way in colonial New Zealand. Such informational colour increasingly acted as a market driver in the nineteenth century, seen for instance in some local publications such as Maskell's work on the identification of local coccid pests. However, because of market risk, expensive colour was not extensively employed by local colour printers in this way, and compromises had to be made, an example being for the printing of H.C. Field's *Ferns of New Zealand* for which the colour printing that had been envisaged by the author did not come to pass.

Where such informational colour had been employed, whether in Britain, New Zealand or elsewhere, faithful colour replication proved to be an elusive goal due to ongoing technological limitations, although proofing processes such as those in place at the firm of A.D. Willis were employed to minimize the colour errors. Many artists insisted on personal supervision of New Zealand subject matter to maximise attainment of satisfactory colour standards, even if being undertaken back in Britain, as did Charles Barraud. However, it was the possibility of technical improvement that was in itself another incentive that inspired continuing experimentation in the field of colour printing technology.

Technological Drivers

Graphic Fashions

Led by publishers exploiting contemporary colour process capabilities, the latest graphic fashions that could be provided by artists and printers over the successive years, reflected in the print products that they produced, continually came and went. Successive colour processes were harnessed to suitable machinery, equipment and other tools as they were invented. Once established, in New Zealand it was particularly the planographic colour processes of tint lithography and chromolithography that became continuing tools. But printers discerned that new graphics processes frequently offered a competitive advantage, for instance, as photomechanical processes began to alter printing capabilities, new public demand for images of a photographic quality was stimulated by their use.

As already seen in section III, the progression of graphic processes in New Zealand, although tailored to the colonial printing environment, had tended to follow trends coming from the northern hemisphere via Britain, with some graphical influence arriving more directly, for instance via New Zealand maps that were colour printed on the continent. At any one time, the respective opportunities or limitations of the colour printing technology that was available to printers had acted as important market drivers. For instance, the introduction of chromolithographic and later process colour opened new market possibilities

to printers in both the parent and the colonial cultures, albeit in a more restricted way in New Zealand. In Britain it had been after Hullmandel's pioneering efforts that the path to chromolithographic colour followed in Britain resulted in a large number of publications produced with colour added by this means. In Britain also, it had been the employment of new nineteenth century colour woodblock techniques that had enabled relief colour to be economically provided and that had allowed the taste for colour graphics to be stimulated, leading to a widening mass marketplace for books. Later in the century, process colour, with its double virtue of the promise of more easily and reliably obtained verisimilitude, as well as an ability to be integrally printed with text, added further strings to the colour printers' bow. However, to develop colour competency for each new process took time.

In New Zealand, the limitations of the market nearly always overrode the printer's ability for costly presentation of colour graphics where book production was concerned, even when appropriate colour printing technology was established. However, as discussed in section III, printers nevertheless made great efforts to acquire the latest colour processes to bring new looks to locally colour printed items. To keep within their means, such capabilities were seen to have found their expression especially in less ambitious illustration, in a wide range of ephemeral items and in maps and prints, especially those produced as supplements to the weekly newspaper special numbers. However, that the progression of lithographic styles had followed those in use in Britain was partly attributable to the similar cultural tastes, sometimes to the potential for representational advantage, but mainly to the constant pressure to lower production costs. In the early twentieth century, both in Britain and New Zealand a trend towards the simplification even of lithographic colour schemes towards a confinement to 'primary' colours to evoke the latest tri-chromatic processes was evident in many print products, and was thus related to both visual and economic drivers. (Plate 60.)

Economics Relating to Costly Colour Processes

Because of the expense of many of the colour processes which, to be provided to an acceptable standard often required specialised plant as well as the services of skilled artists and printers, the question of economics was related to the market driver of graphic possibility. Up to the end of the period under study, the production of colour still involved much labour and great expense, and for this reason, its employment had been facilitated by

Plate 60: 'Otago Daily Times and Witness Christmas Annual, 1905.'

Chromolithographed front cover created by R. Hawcridge.

Published by the Otago Daily Times and Witness Newspaper Co., Limited, Dunedin, N.Z.

By permission of the Alexander Turnbull Library, Wellington, N.Z.

Ref. No.: N-P 586.

OTAGO DAILY TIMES
AND

WITNESS ANNUAL

XMAS
1905

PRICE ONE SHILLING.

PUBLISHERS: THE OTAGO DAILY TIMES AND WITNESS NEWSPAPER CO., LIMITED, DUNEDIN, N.Z.

official need or known market demand. Although in this period of cheaper books and periodicals the larger British market had allowed more colour production overall, nevertheless, commercial success was not assured unless the economics of production matched the means of the projected market segment. If this condition was not in balance such ventures were liable to fail, an example being the production of the famous *Alhambra*, which, in view of its limited audience, proved too costly to produce, and which hence was not a commercial success. Similarly the Antipodean *Art Album* turned out to be uneconomic in production. For more expensive coloured books, pre-publication subscription sales had been common. By providing the assurance of an economic outcome for the printer/publisher such preliminary assurance from the market had been found to be, of necessity, a driver.

Competition in the market often meant that as costs were lowered, quality was liable to suffer. This was especially true of serial publications, which demanded an ongoing presence of technical skills. One solution was to allow costly colour to be an element only occasionally used. In some periods, even in England, colour was virtually absent in the cheaper magazines and consequently in the early days of process printing the black and white photographic image had become the popular graphic fashion. Especially in the smaller New Zealand market, it was because colour *was* expensive that when employed in locally published New Zealand reading matter for the popular market, it was confined to the annual Christmas supplements and other infrequent special numbers of the weekly newspapers. In the study period, for newspapers, colour had not been possible on a daily or even a weekly basis, although the survey of pictorial content and its presentation in chapter 10 shows an ongoing thrust towards the solution of this problem. The absence of colour from the daily newspaper during the period under study does not show a general distaste or lack of demand, but rather that printing processes were not yet equal to the economic realities of such frequency. It was not to be until the second half of the twentieth century that technology advanced to enable the provision of colour in the dailies of New Zealand.

Effective communication through advertising, an essential ingredient of sales strategy, was important also to the economic aspect of the business of the printer. As evidenced in the case study of the firm of A.D. Willis extensive advertising had been employed, especially in relation to the colour printed Christmas cards. This ensured that the potential market, ever watchful for something new, was informed of the innovative products coming from this firm, and that the trade was aware of the colour work that Willis was prepared to undertake on contract. An adequate link between printer and market promoted the sales necessary for income upon which future colour production depended. In this way the practice of

advertising, as integral to the economics of colour printing, was a powerful market driver. As noted in chapter 11 many printed items had carried advertisements to help offset production costs.

It has been seen that the efficacy of colour to add value to maps was one factor that drove the quest for more economic means, and that it had been for this purpose that the latest photolithographic methods had been introduced and financed by the New Zealand government in the 1870s. Herbert Deveril had thus been enabled to make his innovative contribution to cheaper map and other document production in New Zealand. Economies gained via photolithographic processes later underpinned cheaper local colour printing as it had done in Britain and elsewhere. It had been after this time that, as cited in section V, numerous locally printed coloured maps and plans produced by this underlying method had appeared. Later graphic fashions, for instance those that had been dependent on the advent of prepared tints, had also lowered costs by contributing to a standard means of printing, for example, as had appeared in colour printed maps and plans produced overseas, including in Britain. It has been seen in this study that such an economic driver had been similarly responsible for the maps that had been printed in a corresponding way in New Zealand.

As the evidence of the many examples cited in section V has shown, New Zealand colour printers had continually investigated other methods of working within economic constraints as had their counterparts in Britain. These included experimentation with the viability of smaller formats, the use of limited colour (which nevertheless could be judiciously applied to gain desired effect), and over time, the employment of automated processes and longer runs. Where economic considerations were expected to limit sales, it had long been traditional to produce an item both in cheaper black and white and more expensive colour to allow the market to decide, and that this practice had continued in New Zealand was evident, for instance, from information concerning maps. Around the time that three and four colour process printing was beginning, the simplification of chromolithography towards the use of fewer colours, as discussed with reference to many examples in this section, had also been partially directed to lowering costs. But another advantageous result was that because such a trend also fitted with the graphic fashions of the times, increased market desirability leading to increased sales could render production more cost-effective.

The production of colour in conjunction with the weeklies had to be financed largely from revenue brought in from advertising, and as always this was heavily dependent on increasing circulation. In turn, circulation was stimulated by the provision of such

enticements as the lift-out chromolithographs. Gradually it became true that it was particularly the larger firms such as Wilson and Horton which had acquired larger circulations that could afford such production. For the annual Christmas numbers, advertisement was routinely used as a pre-selling device and orders were taken.

Local Drivers

Local Culture & Artistic Taste

The nature of the local colonial culture of the time had also played a part in the way colour had appeared in the marketplace of print. While the availability of art affected taste, the state of the local culture affected settlers' priorities for its acquisition to an extent. When it had been necessary to devote much time and resource to practical matters, especially in the early decades, locally executed colour prints were uncommon. Much of the depiction of the environment that had at first been carried out by northern hemisphere explorers, scientists and surveyors was more by way of official documentation than for local artistic purposes. In Britain nineteenth century taste for watercolour paintings had resulted in many original art works in that medium, as well as others created by other means such as the oil paintings, drawings and photographs of the period, some of which had been reproduced as prints. Many depictions of New Zealand and aspects of its colonial life had likewise been originally produced in watercolour and other media from which coloured prints had been created, but especially at first, much was taken back to Britain for reproduction and later appeared in printed colour in the numerous books and scientific reports that were produced as an extension of British interests of the times.

In the richer artistic northern climate, the appreciation of the autographic print as art-work had provided a larger market share for colour printers in the home country than in the colonial sphere, although as time went on Antipodean reproductive prints, especially those from commercial printing houses, had gradually played a greater role in establishing local cultural identity. However, the relative paucity of affordable colonial art did not make for wide local ownership of original works, but rather created a local New Zealand market niche that was both filled and fed by such productions as the chromolithographed and other prints and maps provided with the special numbers of the weekly papers. As in Britain, these periodicals also provided a source of coloured prints for the mass market, for those who were not wealthy enough to own original art to hang upon the walls. In so doing, these special gift prints had created an expectation in the popular marketplace. Usually appearing at Christmas or sometimes to mark an event such as a coronation, the colour prints were promoted as being more valuable than the black and white engravings or the ink photos that

were quite regularly produced in the body of the papers from the nineties onwards. These black and white process images were probably less apt to be framed or kept, whereas the typically chromo supplements were provided loose for the purpose. That their production persisted long after three and four colour printing was possible bespoke their popularity, although, as standards improved and ease of production increased, towards the end of the period gift colour process prints became more common.

In the Old Country, there had been a cultural tendency to look outwards and backwards in the nineteenth century, with themes such as the gothic revival, antiquarianism, the art of the great masters, images from history, foreign places and the wider natural world all appearing in many colour printed products. In turn such cultural drivers produced scope for a broad spectrum of subjects to be illustrated in colour in a marketplace in which there was more room for lavish books. Especially towards the end of the century, a new emphasis on colour in artistic circles rekindled a general cultural interest that had impinged also in the marketplace of print as, for example, artists' prints came to the fore and the coloured poster became a popular item.

For at least the European population in New Zealand, towards the end of the nineteenth century a growing interest in art had been reflected in the establishment of more local cultural institutions such as art galleries. Such local interest in art had provided local printers with opportunity. Although the emotional attachment to the places the colonials had left behind determined that there was a market for images from their nearer past, especially images from 'Home', a growing new desire for images that reflected the uniquely local followed the necessity of achieving settlement in a psychological sense.

The New Zealand Environment – Social and Physical (Natural and Built)

As a part of the achievement of that shift in feeling, the reflection to themselves of elements from the new environment was important to the sense of new identity and belonging to the place which was now their home. Because this was emotionally important, a rising local popularity of images reflecting the New Zealand environment acted as an ongoing driver in the market. Depiction in the form of images of the physical and social environment had long been an established aim of artistic endeavour that was well reflected in British colour printers' work, for instance in the natural history books from William Fawcett. Antipodean images, including those from local New Zealand printers, were created for such purposes as well, not only as documentary scientific records, but also to affirm a positive image of colonial 'progress'. Affording a means to compare and contrast with what they knew, such

images acted as a way for European settlers to come to terms with new relationships demanded by unfamiliar aspects inherent in a new geography.

The increase over time of such pictorial matter, especially in the newspaper weeklies, would have added to the average New Zealander's acquaintance with the appearance of many facets of themselves. At the same time, the relatively large local circulation of these publications and their special numbers served to familiarise a large proportion of the population with the same images, thus effecting a certain commonality of consciousness as part of the emerging New Zealanders' identity *with* New Zealand. It has been seen that the colonial market had an increasing appetite for images that reflected not only the physical environment—the topography, the fauna and flora—but also the colonists' relationships to themselves and others, especially to the indigenous people, the Maoris. This had a snow-balling effect, as a particular New Zealand identity was forged, though with the flavour of the Australasian.

In section V the many examples of colour printed images discussed that were reflections of aspects of the natural environment and of the Maori people have demonstrated the importance of this driver. Differences as well as similarities to Britain had been the focus of much local fascination. While images of towns constructed in the British image had been of interest, such unlike features as the volcanic and the alpine regions, and the indigenous fauna and flora had provided colour printers with subjects of seemingly endless appeal. It was especially the unique New Zealand images, for example, those of kiwis, erupting mountains, sinter terraces and snow-capped mountains that had become iconic, and were responsible for establishing commonly held views concerning the physical nature of the country. Such images were absorbed at home and borne abroad not only via the plates in coloured books such as Charles Barraud's *New Zealand Graphic and Descriptive* that concentrated on the natural topography, but also in prints and books concerned with botanical and zoological subjects such as those on the native flowers that were reproduced from the many paintings by especially women artists. Many images of the Maori presented in colour, for instance, in the special numbers of the weeklies, reflected aspects of the indigenous people to the world. Whether portraying the Maori people authentically or not, they were continually conveying visual images that contributed to commonly received impressions.

In addition, townscapes and images of the built environment such as the views produced by A.D. Willis had been popular. New Zealand images combining many elements had

appeared on the more ephemeral items such as the Christmas cards and view postcards from this colour printer, and from around the turn of the twentieth century pictorial views had been used on the national postage stamps as well. The evidence of such items has shown that use of colour had been found efficacious also in a different sense. Printed colour was increasingly being used in pictorial graphics that were advertising New Zealand as a tourist destination. As it played a part in an industry that was of growing economic importance to the developing economy the rising popularity of tourism was also providing opportunities for colour printers.

As mentioned, the greater general desire for coloured graphics was in part associated also with advancing scientific interest. As the element of printed colour was increasingly seen in images, its employment as a facet of data reportage also rose. In this section many examples have been given of local printed colour used to represent information collected concerning the unique New Zealand natural environment. Such colour was sometimes incorporated into the print products that resulted from official surveying and mapping of the contour and structure of the land, in articles for learned journals and in some books published to appeal to the lay person interested in science. For instance, as used in W.M. Maskell's book *An Account of the Insects Noxious to Agriculture and Plants in New Zealand*, colour was important to the identification of agricultural pests. Although for New Zealand subject matter, much colour printing associated with scientific endeavour had been repatriated, some had been locally executed, for instance for the important *Transactions and Proceedings of the New Zealand Institute*. The Government Printer sometimes contracted this work out to private colour printers, as had been done when the firm of A.D. Willis had executed the chromolithographic illustration for Maskell's book.

Kinship and Nostalgia

Both kinship and nostalgia have been seen to be drivers in the New Zealand marketplace of print. As a competitive relationship was emerging trade-wise, New Zealanders were demonstrating a continuing interest in the larger neighbour, Australia, a country with which they were trade rivals throughout the period under study. The appearance of images from Australia in such popular papers as the *Weekly News* speaks of the market in New Zealand for trans-Tasman information – the not too dis-similarly oriented colonial consciousness providing a not dis-similar market. Towards the end of the nineteenth century, the publication of school and children's story books on an Australasian basis was one indication of similarity in the Australian and New Zealand marketplace of print. That colour printing jobs for New Zealand items were sometimes being executed in Australia was also indicative

of an Australasian consciousness, although this practice brought a further element of competition to New Zealand colour printers.

In Britain, among those who had remained, a continuing interest in their now colonial kin had created a 'Home' market for prints reflecting the colonial situation, for instance, as had been represented in George Baxter's prints of Australian scenes depicting circumstances on the gold-fields. On the other hand, strikingly, images from Britain continued to impinge in New Zealand where a strong market existed for visual reporting of events at 'Home', especially those pertaining to the monarchy, creating a window through which the New Zealand perception of global affairs was often filtered. Often presented in colour, such images, particularly of special events surrounding the Royal family such as the Queen's Jubilee or the Coronations, frequently appeared in the special numbers associated with the weeklies. At such times, the supplements would typically revert to an almost exclusive concentration on 'things British'. (Plate 61.) Reinforcing identity with Britain, these graphics occupied a considerable market share. A hybrid identity was being fostered, and was affording the local publishers, especially those providing the weekly newspapers, an opportunity to market pictures not only from New Zealand but also from abroad.

With their high pictorial content, the annual and special supplements from the weeklies thus became a shaping influence, so that commonly, the New Zealand perception of the world contained large proportions of two disparate elements. An identity with the British culture tempered the emerging New Zealand identity, and both elements were reinforced through the images, especially the colour images which were marketed to provide a special impact. This hybrid identity, a strong and persistent feature of the New Zealand psyche was developing as pictures of England constantly perpetuated nostalgia as a market driver.

Local Technical Advances: Competitive Edge & Professional Pride

For the colour printers, keeping up with the latest graphic processes was necessary to the maintenance of a competitive edge. As demonstrated by examples from the graphics print production of this period, motivated printers and publishers had employed first black and white woodcuts and engravings, then lithographs, line blocks, photolithographs, tinted lithographs and chromolithographs as available and judged advantageous to business. These were followed by process images, coloured process images and three and four colour halftones. Once introduced, a new colour process commonly became regularly used in print products across the board, as also exemplified, for instance, in the genre study of Christmas and other special numbers. Although New Zealand printers had worked hard to keep up

with overseas colour printing trends, to do so had been part of their professional obligation and pride, and was another factor responsible for the kinds of graphic productions appearing on the market, although limiting factors such as plant and skilled personnel, both dependent on sufficient finance, had often modified ambition.

However, it has been seen in section V that when it had become economic to provide copious pictorial material from half-tone printing, the new possibility did not replace the demand for colour. Instead, this taste was eventually combined with the popularity of the photographic image. The co-existence of the chromolithograph and the colour printed half-tone for many years demonstrated a continuing demand for the colour image regardless of the latest fashion. But that from the turn of the century onwards many images produced from combination processes were in evidence also indicates that printers were endeavouring to stimulate and satisfy demand in every way possible. As they sought to achieve market advantage by employing 'new looks', colour printers were also educating and influencing taste. Towards the end of the period printers used many ingenious tricks of the trade to give the customer the coloured pictures which, although lithographed, also had the appearance of the newer half-tones, so that their large investment in lithographic plant continued to bring returns. Such trends were evident drivers in both the parent and the colonial cultures, but tailored to local markets, expertise and availability of processes. Such themes as flags and royalty, very much associated with colour, afforded the printers a golden opportunity to combine a presentation that not only used the patriotic colours red and blue, but because these were also 'primary' colours, created the *suggestion* of the latest tri-chromatic colour processes. The presence of coloured illustration featuring primary colour in children's primers was another instance of an opportunity colour printers had found to employ such simple colour to both stimulate and satisfy the preferences of the youngest readers.

As in Britain, many market drivers were closely related: inspection of numerous images that had been colour printed in New Zealand revealed that local printers had endeavoured to follow overseas graphic trends, in particular British trends, although professional interest in keeping technically abreast was also necessary from an economic point of view, seen, for instance in the ubiquitous use of photolithographic transfer methods and in the employment of prepared tones in chromolithographic printing of many kinds – particularly for maps and

Plate 61: 'New Zealand Mail Wellington Christmas, 1900.'
Chromolithographed front cover. Published by the Wellington Times Company Ltd.
By permission of the Alexander Turnbull Library, Wellington, N.Z.
Ref. No.: N-P 583-Front-

THE NEW ZEALAND MAIL

WELLINGTON

1900

CHRISTMAS

commercial prints. Most colour printing firms did not have the economic luxury to re-invent the wheel, but followed methods that were known and documented. For colonial printers, it has been seen that this was important in a technical environment that was increasing in complexity. Conversely, the slower evolution of economic methods of colour printing had until the nineteenth century been the major reason that colour had for so long been largely unavailable to the mass marketplace of print. But, as is evident in section V, the presence of colour in nearly every locally colour printed product other than the daily newspaper, showed that the nineteenth century was the period in which colour printing's time had come, even in New Zealand.

Isolation and Small Population

Difficulty in obtaining plant and skilled personnel, both dependent on sufficient capital, were pervasive limiting local factors related to the market driver of geographical isolation. In comparison to British proximity to industrial centres, for New Zealand, distance hampered ready procurement of the technical means for colour printing, while the small population and consequently small local market was responsible for the fact that colour printers faced a relative disadvantage with regard to cost effective production. By the late nineteenth century, in New Zealand it had been only the larger printers who were able to afford the expense of colour printing in any substantial way. Besides the technical limitations, this was a reason that in locally produced New Zealand reading matter, colour had been typically provided as a treat, even in the widely circulated newspapers, and appeared on an annual rather than a weekly or a daily basis.

Response of New Zealand Colour Printers to Market Differences

Appropriate Production and Acquisition of the Means

In British daily life print products played an important part, and likewise in New Zealand, where the cultural thrust of settlers had essentially been to follow a British way of life, many printed items were required for everyday practical purposes. It had often been within the confines of commercial jobbing pursuits that such ephemeral items had been produced in colour for the local marketplace of print, (as detailed in chapter 11), as well as for such essentials as local maps and plans. In the absence of a rich print culture in the nature of the British, which was enhanced by its proximity to the Old World printing centres, New Zealand colour printers had assessed the opportunities presented within the colonial culture, initially establishing small pockets of colour printing business around the activities of supplying pressing needs.

In this way such items as the early colour printed lithographic maps had appeared from the enterprising Ward and Reeves in the eighteen sixties. Some printers who had early seen an opening to provide colour in their jobbing work, for instance, Mills, Dick and Co. in Dunedin, had been responsible for the provision of such items as attractively colour-printed food labels. Others had addressed the initial lack of presses suitable to the emerging colonial lithographic printing needs. For example, by becoming early importers of such equipment for their own colour lithography, the firm of Fergusson and Mitchell had led the way in this regard. Such importation of equipment became an enduring pattern in a country that turned out to lack the raw materials of heavy industry, and helped set the stage for the possibility of appropriate local colour printing. Gradually, as agents and importers were established, some undertook supply responsibilities and others facilitated distribution of print products at home and abroad to ameliorate difficulties posed by distance. The inventive spirit of New Zealand colonial printers had often played a part as they improvised and constructed equipment that they lacked, a typical example being the early Christchurch process worker John Taylor who struggled to devise suitable screens for half-tone production.

Although the New Zealand colour printers lacked the large centres of population generating the volume of service needs necessary to duplicate a printing environment such as that present in London where much of the English colour printing was aggregated, they did not lack enterprise. This study has shown that many had learnt to modify business horizons to concentrate on jobbing colour in order to avoid the financial difficulties anticipated if more substantial works in colour had been attempted, for example as had been faced by Bock and Cousins in the printing of the ambitious Featon's *Art Album of New Zealand Flora*. To make best use of existing plant, by the end of the period printers, in all the main centers at least, had adapted chromolithographic printing to produce a range of attractive colour products which could compete alongside the modern half-tone images that were gaining popularity.

Evidence for the persistence of the chromolithographic element has been discussed in relation to many formats. As seen by the provision of the Coronation tri-chromatic print of 1902 in an Auckland *Weekly News* supplement shortly after the possibility of printing such images became a reality in New Zealand, prints created by process colour were at the time considered special. But for the later 1911 coronation of King George, for the lift-out of the Royal Couple printed by the Christchurch *Press*, even though this was the city in which tri-chromatic printing had been first pioneered, chromolithography had been used. The side-by-

side existence to the end of the period of both locally printed chromolithographic print products and items created by process colour demonstrates that New Zealand colour printers had responded to local market conditions by diversifying their approach. The evidence of section V has highlighted the effort to present a hybrid of the two methods in a way calculated to appeal to both the 'modern' taste for colour photos, and the traditional taste for art prints. Demonstrated also through the colour printed images that appeared in the special numbers of the weeklies, at a time when locally colour printed children's books had not appeared viable for most New Zealand printers, the Christchurch Press Office had produced coloured children's pages, for example, in the 1911 Christmas number. This was a way of reaching an even greater general public, and of capturing the future readership of the weeklies along the way, an enterprising departure in local niche marketing.

As observed, the power of the image is such that if reiterated often enough it tends to cement an impression. The depiction of the Maori in sentimental terms, especially on the coloured covers and liftout supplements intended for framing, often created Maori as iconic pictures rather than as images reflecting real people. In some productions, indigenous people were being made visible to the outside world as exotically foreign, and equated with the scenic wonders of New Zealand. The production of such images for the covers, special numbers and supplements had been in response to a correct perception of a market demand for the exotic, but the unintended side effect was that such images had influenced how the Maori was to be viewed.

It has been said that because the exactly repeated image is capable of being economically produced and widely distributed, it can speak to a wide variety of viewers, thus becoming a communications device of significance.³⁰³ However, Carole Shephard has pointed out that even in recent times, private printmaking in New Zealand has remained a modest medium within the art context "where popular and commercial images flood the market and where critical, social and political works fail to hold a substantial position, primarily through lack of an intellectual frame of reference."³⁰⁴ Just as in the biological world the ecological barrier of the sea enabled the evolution of new species of plants in New Zealand, leading in time to a flora containing a great proportion of indigenous species, so in the world of art, a distancing from the centres of scholarship and practice can be seen to have led to a loosening of the ties of tradition, both those to the mainstream movements, and between the artists themselves. While such a situation was uncondusive to the sustenance of such frameworks, in turn making for a loss of recognition and perhaps even of credibility and status for the artist, the relatively isolated position was also liberating, in the sense that it

provided the autonomy which can predicate the creative leap, consequently providing fertile ground for artistic originality. It has been observed that the nature of the new is that it is “created not out of the old, not out of the best of the old, but out of the *death* of the old.”³⁰⁵ For New Zealand printmakers, although the hazards of the loss of the old context were real, the possibility for cultural enrichment was provided for the appearance of the truly new in the form of works that sprang from relationship with the new environment itself, and which were thus authentically and intrinsically part of the new situation.

In the colonial situation, such possibility inevitably took time to unfold and develop, and the lack of cultural sustenance in the new environment was a considerable barrier. The art of the individual print-maker has always involved effort, both creative and physical, but in addition to such effort, the printmaker in the isolated New Zealand setting was forced to struggle not only with the more universal issues surrounding the medium, such as distinctions that have been drawn between hand-produced and machine-produced work, but also with local issues – the particular challenges of isolation, and of the small, sometimes almost non-existent market. In such a climate the tenacity required proved a difficult hurdle, and artist’s printmaking in this period and beyond remained a minority pursuit.³⁰⁶ In the isolation of nineteenth century colonial New Zealand, more prints tended to emanate from commercial establishments rather than from the private artist, for whom a necessary autonomy had the tendency to militate against engagement in any political positioning concerning the art. As discussed in chapter 11, some printmakers did create works in colonial New Zealand, and it was not surprising that the medium they chose was generally lithography, the dominant autographic print process of the day.

For commercial colour printing, the existence of enduring British ties gave access, albeit indirectly, to that wider marketplace of print which, since the early days of exploratory voyages to the South Seas, had become receptive to New Zealand graphics through familiarity with the resulting maps, prints and illustrated books. New Zealand colour printers had taken advantage of this, as discussed. Although they had rarely found colour printing cost effective for the larger more expensive book editions, New Zealand printers found some place for colour according to the demand they perceived within the market segment that was their particular target. From the time of the beginnings of colour printing in the eighteen sixties, New Zealand colour printers had responded to marketplace conditions to provide colour from the press for a variety of print products across a wide genre range that included annuals, catalogues, magazines and maps as well as the multitude of ephemeral items serving everyday colonial needs.

- ¹ E.M. & D.G. Ellis, *Early Prints of New Zealand, 1642-1875* (Christchurch: Avon Fine Prints, 1978), 113.
- ² Alexander Turnbull Library, Drawings and Prints, items, B-088-011 and B-088-012.
- ³ C.T. Courtney Lewis, *George Baxter (Colour Printer): His Life and Work: A Manual for Collectors*, (London: 1908), 151.
- ⁴ Alexander Turnbull Library, Drawings and Prints, item, B-088-014.
- ⁵ Ibid., item, B-088-005.
- ⁶ Ibid., item, B-088-013.
- ⁷ Ibid., item, A-104-024-b
- ⁸ Anne Kirker, 'Lithography in New Zealand: A Coming of Age', in Pat Gilmour, ed., *Lasting Impressions: Lithography as Art* (London: Alexandria Press, 1988), 297.
- ⁹ Leigh Astbury, 'Art Publishing', chap.19 in Martyn Lyons and John Arnold, eds., *A History of the Book in Australia, 1891-1945: A National Culture in a Colonised Market* (St. Lucia, Qld.: University of Queensland Press, 2001), 316.
- ¹⁰ *Wanganui Chronicle*, September 8th 1886, 2.
- ¹¹ Una Platts, *Nineteenth Century New Zealand Artists: A Guide & Handbook* (Christchurch: Avon Fine Prints, 1980), 34.
- ¹² Kirker, 'Lithography in New Zealand: A Coming of Age', 297.
- ¹³ Print Council of New Zealand, *Exhibition [2]* [Ak: 1969], introduction by Gordon H. Brown, [2].
- ¹⁴ Kirker, 'Lithography in New Zealand: A Coming of Age', 297.
- ¹⁵ Una Platts, *Nineteenth Century New Zealand Artists*, 204.
- ¹⁶ Print Council of New Zealand, *Exhibition [2]*, introduction by Gordon H. Brown, [3].
- ¹⁷ Alexander Turnbull Library, Drawings and Prints, item: E-205-q-036. Note: The original is held at the Museum of New Zealand/Te Papa Tongarewa.
- ¹⁸ Carole Shephard, 'The Territorial Divide: Critical Issues in Contemporary New Zealand Printmaking', unpublished thesis, University of Auckland, 1997, 122.
- ¹⁹ Alexander Turnbull Library, Drawings and Prints, item: A-256-041.
- ²⁰ University of Otago, Hocken Library, Print Section, item: E H224, acc. 13,381.
- ²¹ Alexander Turnbull Library, Drawings and Prints, item: B-080-004.
- ²² Ibid., item: A-109-053.
- ²³ Ibid., item: C-066-002.
- ²⁴ R.A. McKay, ed., *A History of Printing in New Zealand 1830-1940* (Wellington: R.A. McKay for the Wellington Club of Printing House Craftsmen, 1940), 231.
- ²⁵ Alexander Turnbull Library, Drawings and Prints, item: C-066-001.
- ²⁶ Ibid., item: C-066-008.
- ²⁷ Ibid., item: D-009-025.
- ²⁸ Alexander Turnbull Library, Tapuhi [database online] (The Library, ca1992-): record C-066-007.
- ²⁹ Alexander Turnbull Library, Drawings and Prints, item: B-033-003.
- ³⁰ Robert Clancy, *The Mapping of Terra Australis* (Macquarie Park, N.S.W: Universal Press, 1995), 148.
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- ¹¹⁷ Alexander Turnbull Library, Map Collection, item, acc. 2770.
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- ¹⁴² *Ibid.*, plate 16a.
- ¹⁴³ *Canterbury Times*, October 1914.
- ¹⁴⁴ Alexander Turnbull Library, Ephemera Collection, item, D-RETAIL-1888-01.
- ¹⁴⁵ *Ibid.*, item, E-DRAMA-1891.
- ¹⁴⁶ *Ibid.*, item, E-MUSIC-1899-01.
- ¹⁴⁷ *Ibid.*, item, E-OPERA-1899-01.
- ¹⁴⁸ *Ibid.*, item, E-KENNA-1905.
- ¹⁴⁹ *Ibid.*, item, D-CABOT-Variety-1900s-01.
- ¹⁵⁰ *Ibid.*, item, D-ALCOHOL- Prohibition-01.
- ¹⁵¹ Canterbury Museum, Pictorial Collection, poster, 1894.
- ¹⁵² University of Otago, Hocken Library, Poster Collection, 1879.
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- ¹⁵⁸ *Ibid.*, item, E-EXHIBITION-1906.
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- ¹⁶² *Ibid.*, item, E-CABOT-Circus-Barton-01.
- ¹⁶³ *Ibid.*, item, C-TRAM. Note: I have no other information about this printer at present.
- ¹⁶⁴ *Ibid.*, item, B-DRAMA-1867-01.
- ¹⁶⁵ *New Zealand Mail*, Christmas number, 1899, 40.
- ¹⁶⁶ Alexander Turnbull Library, Ephemera Collection, item B-MUSIC-1881.
- ¹⁶⁷ *Ibid.*, item, A-MUSIC-1883.
- ¹⁶⁸ *Ibid.*, item, B-MUSIC-Parker-1885-01.
- ¹⁶⁹ *Ibid.*, item, B-OPERA-1886.
- ¹⁷⁰ *Ibid.*, item, A-MUSIC-1887.
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- ¹⁷² Alexander Turnbull Library, Ephemera Collection, item, D-OPERA-1888-01.
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- ¹⁷⁴ *Ibid.*, item, A-VARIETY-1900/1907.
- ¹⁷⁵ *Ibid.*, item, A-MUSIC-1894.
- ¹⁷⁶ *Ibid.*, item, B-DRAMA-1900.
- ¹⁷⁷ *Ibid.*, item, B-DRAMA-1900.
- ¹⁷⁸ *Ibid.*, item, B-DRAMA-1899-01-cover
- ¹⁷⁹ *Ibid.*, item, A-VARIETY-1900/1907.
- ¹⁸⁰ *Ibid.*, item, B-DRAMA-1905.
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- ¹⁸² University of Otago, Hocken Library, Poster Collection, 1879/80.
- ¹⁸³ Alexander Turnbull Library, Ephemera Collection, item, B-PEOPLE-Munt-1891-01.
- ¹⁸⁴ Alexander Turnbull Library, Drawings and Prints, item, A-256-004.
- ¹⁸⁵ Alexander Turnbull Library, Ephemera Collection, item, B-EXHIBITION-1906.
- ¹⁸⁶ *Ibid.*, item, B-EXHIBITION-1906/1907.
- ¹⁸⁷ *Ibid.*, item, C-ROYAL-1901-01.
- ¹⁸⁸ *Catalogue of Plants Cultivated for Sale by William Martin Nurseryman and Seedsman, Fairfield Nursery* (Dunedin: Mills, Dick and Co., 1872-3). Held: Dunedin City Council, Otago Settlers' Museum.
- ¹⁸⁹ Roderick Cave, *The Private Press*, 2nd ed., rev. and enl. (New York: R.R. Bowker, 1983), 285.
- ¹⁹⁰ *Matthews Descriptive & Priced Catalogue of New Zealand Flora: Ferns, Seeds, Plants & Shrubs & Trees* (Tablet Print and Litho. Co., Dunedin, [1890s]). Held: Dunedin City Council, Otago Settlers' Museum.

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- ¹⁹² Ibid., item, C-COSTUME-1897.
- ¹⁹³ Ibid., item, A-HORTICULTURE-1899-01.
- ¹⁹⁴ Ibid., item, A-HORTICULTURE-1899-01-back.
- ¹⁹⁵ Ibid., item, A-HORTICULTURE-Nairn-1901.
- ¹⁹⁶ Ibid., item, A-HORTICULTURE-Nairn-1906-37.
- ¹⁹⁷ Ibid., item, B-HORTICULTURE-Horton-1904.
- ¹⁹⁸ Ibid., item, B-HORTICULTURE-Horton-1905-01-16.
- ¹⁹⁹ Ibid., item, B-HORTICULTURE-Horton-1905-10.
- ²⁰⁰ Ibid., item, A-HORTICULTURE-1907-Laird.
- ²⁰¹ *Canterbury Times*, September 12th, 1895, 23.
- ²⁰² *New Zealand Mail*, Christmas number, December 3rd, 1896, 55.
- ²⁰³ Alexander Turnbull Library, Ephemera Collection, item, F-MEAT-Gear. Note: All examples of labels mentioned are to be found in this scrapbook of meat labels unless otherwise referenced.
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- ²⁰⁵ Alexander Turnbull Library, Ephemera Collection, item, The New Zealand Meat Producer's Board, 'The New Zealand Meat Industry' [brochure], London, n.d.
- ²⁰⁶ Alexander Turnbull Library, Ephemera Collection, item, F-MEAT-Gear-012.
- ²⁰⁷ Ibid., item, F-MEAT-Gear.
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- ²⁰⁹ Ibid., item, C-MEAT-1900s.
- ²¹⁰ Ibid., item, F-MEAT-Gear, newspaper cuttings, [174].
- ²¹¹ Ibid., item, A-STATIONERY-B
- ²¹² Ibid., item, A-SHIP-1896-01.
- ²¹³ Ibid., item, E-CALENDAR-1882-01
- ²¹⁴ Ibid., item, E-CALENDAR-1900/1909
- ²¹⁵ Ibid., item, D-CALENDAR-1910
- ²¹⁶ R.P. Hargreaves, *From Beads to Bank Notes: The Story of Money in New Zealand* (Dunedin: J. McIndoe, 1972.)
- ²¹⁷ Ibid., 23.
- ²¹⁸ Ibid., 58.
- ²¹⁹ Ibid., 51.
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- ²²¹ R.P. Hargreaves, *From Beads to Bank Notes*, 73-74.
- ²²² Ibid., 112-113.
- ²²³ Ibid., 109.
- ²²⁴ *Typo*, 3 (November 1889): 126.
- ²²⁵ R.P. Hargreaves, *From Beads to Bank Notes*, 119.
- ²²⁶ Ibid., 119-120.
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- ²²⁸ Ibid., 134.
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- ²³⁰ Ibid., 15-16.
- ²³¹ Ibid., 23.
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- ²³³ Collins and Watts, eds., *The Postage Stamps of New Zealand*, 28.
- ²³⁴ Michael Twyman, *Printing 1770-1970: An Illustrated History of its Development and Uses in England*, with a new foreward by Ruari McLean and an additional bibliography (1970; reprint, London: British Library, 1998), 117.
- ²³⁵ Collins and Watts, eds., *The Postage Stamps of New Zealand*, 29.
- ²³⁶ Ibid.
- ²³⁷ Ibid., 32.
- ²³⁸ Ibid., 52.
- ²³⁹ Ibid., 54.
- ²⁴⁰ Ibid., 50.
- ²⁴¹ Ibid., 55.
- ²⁴² Ibid., 56.

- ²⁴³ Ibid., 44.
- ²⁴⁴ Laurie Franks, *All the Stamps of New Zealand*, rev. ed. (Wellington: A.H. & A.W. Reed, 1981), 20.
- ²⁴⁵ Glue, *History of the Government Printing Office*, 63.
- ²⁴⁶ R.J.G. Collins and Watts, eds., *The Postage Stamps of New Zealand*, 64.
- ²⁴⁷ Ibid.
- ²⁴⁸ Ibid., 96-97.
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- ²⁵³ *Typo*, 4 (May 1890): 60.
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- ²⁵⁵ Marcel Stanley, *Alfred Ernest Cousins, a Postage Stamp Die Engraver, Die Sinker, Medallist, Copper and Brass Plate Engraver: An Illustrated Biography* (Whitcoulls, Wellington, 1980), [3].
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- ²⁶⁵ Ibid.
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- ²⁶⁹ *Typo*, 6 (1892): 63.
- ²⁷⁰ Alexander Turnbull Library, Ephemera Collection, item, A-CARDS-Christmas-1910.
- ²⁷¹ Ibid., item, A-CARDS-Christmas-ca1900-1919.
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- ²⁷⁶ Ibid.
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- ²⁸⁵ James Hector, 3 ed. rev., *Handbook of New Zealand with Maps and Plates* (Wellington: Government Printer, 1883), addendum: under the heading 'Statistics for 1882...Postal Correspondence'.
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- ²⁸⁸ Gael Newton, *Shades of Light: Photography and Australia 1839-1988*, with essays by Helen Ennis and Chris Long and assistance from Isobel Crombie and Kate Davidson (Canberra: Australian National Gallery; Collins Australia, 1988), 90.

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- ²⁹⁰ Ibid., item, A-POSTCARDS.
- ²⁹¹ Ibid., items, A-POSTCARDS-MAORI-01
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- ³⁰³ Elizabeth Grierson, *New Zealand Women Printmakers: Zonta International Touring Exhibition: Celebrating Suffrage Centennial 1993*, [Exhibition curator, Carole Shepherd; photography, Lynne Logan] ([Auckland, N.Z. : Zonta International, 1993]), foreword.
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SECTION VI

Standards and New Zealand Colour Printing

CHAPTER 12

INNATE AND ACQUIRED:

TOOLS, TRAINING AND ADVICE FOR EXCELLENCE:

A RETROSPECTIVE

Research Questions:

7. *What has been the role of standards in colour printing? What advice was being given to printers concerning excellence of standards for colour work and how did New Zealand colour printing standards over the period compare with those in Britain?*

8. *What part has colour vision played in colour printing production and why has an understanding of the mechanism of human colour vision been important to colour printing standards?*

Quotation:

...But above all, the heart
Must bear the longest part.¹

In Pursuit of Standards: Colour Printing and Colour Vision: Reciprocal Relations

Introduction

That there has always been a desire for colour, whether fulfilled or not, can be explained by the fact that for the human species, vision is a most important sense, and colour vision is a significant part of that sense. The ability to see colour and to appreciate and enjoy its qualities is one way in which human perception is enriched. Not only is colour an element which can add beauty to our world, but it also has been shown to be essential to our own biological evolution. These are factors which have given the attribute of colour both desirability and importance. Although fashions in the expression of colour have come and gone, and although cultural emphases of that expression have embodied a variety of colour preferences, it is nevertheless the human ability to perceive colour which has remained the constant. William Ivins has pointed out that it is through direct sensory awareness of objects that we are able to gain a personal acquaintance with objects as distinguished from gaining second-hand knowledge of them, and that "among the things no word net can ever catch is the personality of objects which we know by acquaintance."² Through our ability to perceive colour, we are able to add a valuable tool by which we can achieve that acquaintance with the real world, because the visual world in which we live is made up of objects of various forms and colours. The visual image, including the printed image, can act as a reflection of the real world, as it is through the eye that both original and image are perceived. Thus the

printed image can become the transmitter of the truth of the personality of the world in all its particularities, provided the printed image records that personality with fidelity.

Because part of the truth of the perceived world, in a scientific sense, is its colour, the truthful transmission of this aspect via the printed product depends upon the printed colour faithfully reproducing the colours as they appear in the original. Through the development of colour theory and science, especially over the last century, this has become more nearly possible. Theory of colour has partly been built on the laws of physics and chemistry as they apply to the behaviour of light interacting with pigments that are mixed and matched, but this theory must also take into account the way in which we physically perceive colour. Because the experience of colour is a phenomenon of sensation, having its basis in the human physiology of vision, an acquaintance with the structure and function of the visual system provides a useful understanding of some of the mechanisms by which our experience of colour in both the world of real objects and the symbolic world of printed visual images is possible, and also provides reasons for some of its limitations. (See Appendix 3.)

Colour and Effective Communication in Print Media

Because production of colour in print media is rarely for its own sake, but rather anticipates reception in the marketplace, standards, both for design of printed items and for the processes used in their production have been developed accordingly. As most printing has communication as its purpose, the standard of the printing should be appropriate to the facilitation of the efficacy of that communication. For commercial purposes the marketplace largely decides appropriate and acceptable standards for any printed item according to the range of products available for comparison, so that available products become the criteria by which various sectors may make such judgement. In the world of colour printing, graphic designers have an ongoing concern with colour choice because it is part of their business as communicators in the visual arena.

Colour coding has been successfully used to make use of the strength of human colour perception in a variety of ways, including communication via colour coding safety systems and colour symbolism in advertising. Many colour systems have been built up in connection with communications of cultural significance, while others have been explored to discover how the element of colour may be optimally used to aid communication in words and images. When choosing a colour to go with type, for instance, in deciding on a suitable colour to go with a specific headline or copy text, as well as the primary question of

legibility, the designer considers many factors such as “credibility, novelty and the elevation of the message’s mood,”³ The dominance of any one consideration such as legibility or visual interest depends on the purpose of the printing.

As well as in colour images, colour for typography is commonly used to communicate information in printed matter such as magazines, book covers and jackets, maps and many ephemeral items such as catalogues and greeting cards. It has been pointed out that for such communication, simplicity is basic to effectiveness and that colour is the most immediate form of communication because colour connects with the viewer more directly than either words or numbers.⁴ If these concepts are combined, colour becomes a powerful tool in the hands of a good communicator. In print media the visual effects of the colour combinations to be used for graphics or typography must be carefully considered in order to maximise the opportunity for effective communication. Colour can be used to create and hold attention but should not distract the reader from the meaning, for if it is too overpowering it can create the impression of a ‘hole’ on the page. Colour combination can also affect the legibility of type. It is known that while black type on a white page remains the most legible combination, the most visible is black type on a yellow page, and this is also the next most legible, followed by yellow on black, green on white, and red on white. The least legible colour combinations are considered to be red type on a blue background, white on red, black on green, orange on blue, yellow on orange, yellow on white, red on orange, red on green, and green on orange. White type on a black ground is also considered to be difficult to read.⁵ Many of these effects, long known to printers and graphic designers, have their basis in the way light interacts with ink and paper pigments, and in turn the reaction of human vision with the visible light spectrum that allows us to perceive the colours in the printed image. An understanding of some of these complex relationships can be usefully explored to shed light on the relationships that were involved in the development of standardisation in the colour printing production environment in the period under study.

The Role of Standards in Colour Printing Production

In any production environment it is the interplay between the human and the material elements that affects the standard of the product. If consistency of standard is desired and is to be achieved, both these variable factors must be made controllable as far as possible. In a given technological era, the selection and maintenance of material elements and procedures underpins such consistency, while on the human side, innate ability as well as training can also be seen to contribute to the quality of the finished product. While ongoing training programmes may lead to skill acquisition and adaptation to suit many aspects of a changing

technological environment, human abilities that are innate and cannot be acquired by training must be sought and hired. Although the propitious confluence of the mechanics of human genetics and a nurturing environment can see such innate ability passed from one generation to the next, the way in which natural attributes are used is not fixed, but rather may be adapted, for instance, to suit a new environment.

In successive periods given human abilities may be employed to hone successive skill sets. For the production of colour print products it was true to say that, as the technical environment changed and human adaptation followed, new skills were learnt and innate abilities were often redeployed. For instance, the innate 'artistic' colour discrimination abilities possessed by the old chromolithographers were again manifest in succeeding generations, but found new expression, for instance, within the rising profession of the commercial artist working in a more mechanised production environment, partly because, for colour printing, even the photomechanical processes involved the use of human colour judgement. For this the practitioner's essential tool is excellent colour vision, a physiological condition that confers a visual ability that is necessary to the maintenance of consistent standards, even in the largely mechanised production environments of today. In the pre-photomechanical colour printing era, excellent colour vision and colour judgement can be seen to have been tools that were essential to any attainment of that consistency of standard on which could rest a market edge.

One role of standards in the marketplace of print is the encouragement of consistent quality, without which the reliability of print products across a particular run, and also between runs, cannot be guaranteed. This has been especially important in the realm of colour printing, which throughout its history has often been employed to reproduce original art work, in which case the purpose of production lies in the creation of multiple copies that are each as near the original in visual quality as possible. If the matching of colours in an original is not a requisite, for instance in a job in which colour of choice has been added to an image in black and white, or where colour has been introduced as a design element in an item for which contrast is perhaps the dominant determinant rather than a particular colour choice, standards are still of importance for the achievement of consistency across the run, so that in all these cases, each item produced for a particular job has a uniform appearance. A reliable uniformity of product quality underpins the efficiency of uniform market pricing. Thus adherence to standards in the production environment allows the attainment of consistency, which in turn confers reliability in the product, a quality that is well-known to be valued by the client.

Because the marketplace of print is itself made up of many market segments, each with a more-or-less known clientele, the print quality standards required for each may vary widely, a situation that will be expected to be reflected in the pricing of particular print products. In turn such standards reflect costs incurred in their production, due to the employment of more or less costly processes, tools, human abilities and skills. In order to match production costs and returns with market sector quality expectations, while still leaving a living profit, a printer in business must control print quality, not only by ensuring consistency for a particular product, but also through having the technical means available to choose appropriate levels of expenditure for products designed for particular market segments. It is in a competitive marketplace that decisions are made as to what is considered value for money in any period, that is, where judgements are made concerning standards at a given time. However any improvement of standards over time, in both overall quality and the variety of available products, rests on the forward thrust of technological and imaginative innovation which is often incremental, implying a continuous comparison of the old and the new, as standards are adjusted according to market needs.

The promise of satisfaction in the achievement of ever higher standards has often acted as the incentive for the human endeavour invested in innovative experimentation. Stimulated also by natural curiosity, such experimentation has frequently provided new technology that in turn has led to industrial opportunity and product improvement. Although new technology does not guarantee such improvement, it can be seen that innovative experimentation can provide the basis, for instance, for the development of new methods, or the creation of a potentially fruitful business application, and that, in such an environment of research and development, excellence can result. However, in the arena of colour printing, where the technological opportunities were developed over a long period of time, the innovative impulse had necessarily to be constantly renewed. Within the crucible of northern hemisphere print culture, complex interactions involving human endeavour in multiple fields played their part over many centuries, not least those in the field of sustained artistic effort by which the cultural experience of the populace was constantly enriched in diverse ways. It was in turn the cultural environment of rising educational aspiration that provided the background against which nineteenth century technological developments allowed printers to eventually bring colour to the marketplace of print in products tailored to a wide spectrum of demand.

Colour printing followed a much slower evolutionary developmental path than did textual printing, especially before nineteenth century photomechanical processes allowed a

quickening of pace in general image printing. It has seen that the ongoing quest for the improvement of standards had not only occurred as a response to specific market demand in relation to the economic viability of colour processes, but was often also driven by the inventor's impulse to create, to discover, and to strive for better ways and means. Through such inventive effort, challenges along the path to printers' envisioned goals were met and overcome. Within colour print production, incremental innovation and successive problem solving contributed to the ability of the printer to provide the market with a variety of products and a variety of standards. In print culture, these two things, creative incentive and business endeavour, can be seen to have frequently gone hand-in-hand, one feeding the other, as printers have on the one hand used the available technology of their day to bring print products to the market in an affordable way. On the other hand they have experimented with processes not only in order to diversify, but also to improve their methods and the standards of what they produce. In the face of the variety of market sectors that were arising in the nineteenth century and beyond, whether the market for finely printed colour books or that for colour magazines, newspapers, art prints, maps, postcards, greetings cards or other colour printed items, to allow the matching of product standards with the expectations of the target markets, especially in the more rapidly changing technical environment, the achievement of greater controllability of colour printing quality was becoming a necessity more than ever before.

Towards High Standards: Tools and Advice for Excellence

Colour Vision: The Colour Printer's Innate Tool

The innate ability of the colour printer to perceive the subtleties of colour was of great importance, especially before scientific knowledge of colour had progressed enough to enable standards to be developed for the colour printing industry. Rules could be formulated and followed, but the final result was often dependent upon the colour judgements made by the artist/printer and these were therefore an intrinsic part of colour printing processes. For instance, before a chromo-lithographer could begin to print in colours, the original had to be analysed into colour components before he could prepare the set of colour stones. Rules could be used, for example, to determine the order of the printings. One writer of the late nineteenth century, W.D. Richmond advised in this regard that "it will be found a good general rule in chromo-lithography to put all the early colours on every part that will bear them, so as to avoid patchiness, trusting to the subsequent printings to bring up the particular hue required."⁶ Such advice, published in his treatise *Colour and Colour Printing as Applied to Lithography* of 1885, was based on the author's own experience of the visual behaviour of printing inks, and how to optimally use them. By that time some attempt had

been made to provide guidance towards standardising the description of colours, for instance by Werner, whose 'Nomenclature of Colour', was cited by Buller in the introduction to his 1882 *Manual of the Birds of New Zealand* as assisting in consistency in the naming of colours. In relation to description of colours seen in the natural world he said:

The definition of colours in their endless diversity of tones and shades is perhaps the most difficult part of the task, owing to there being no recognised or commonly received standard of nomenclature...[but] the flexibility of our language enables a describer, by the exercise of a little skill and judgment, the free use of qualifying adjectives, to express with precision almost every shade of colour...

Werner's Nomenclature of Colours, although a work very little known or used, I have found very useful for fixing in my own mind certain general rules, so as to insure consistency in my descriptions of birds and other natural objects.⁷

Advice from Northern Hemisphere Practitioners

Besides W.D. Richmond, many other influential practitioners were offering advice in the trade journals and manuals which were available to New Zealand printers to consult, if they so chose. One in which colour printing was treated extensively was John Southward's *Practical Printing: A Handbook of Typography* of 1882⁸, which Robert Coupland Harding had regarded as "the best printers' handbook in the English language."⁹ As the photomechanical era gathered pace, it was more important than ever for the colour printer to acquire technical knowledge relevant to the processes he employed, but, for high standards to result, for instance, in the area of colour book illustration, there was also the need for mutual understanding and collaboration between those responsible for the art and design aspects and those executing the printing. In his work of 1896, *The Illustration of Books: A Manual*, Joseph Pennell, the American printmaker and illustrator¹⁰ who lectured at the Slade, had given salient advice.¹¹ (See Appendix 2D.)

New Zealand Colour Printing Standards

Because communications were maintained with the Northern hemisphere centres of printing innovation, for New Zealand colour printers the relative isolation, although acting as an obstacle, did not constitute an insurmountable barrier to trade knowledge and to the acquisition of up-to-date equipment. It has been seen that regular contact with overseas print cultures was ongoing by means of trade journals, travellers in the trade and the shipping of supplies. The settler printers had brought, transplanted and nurtured the traditions particularly from the British/European print culture. Although relative standards had not been high at the time of their diffusion to the new place, later, individuals such as Robert Coupland Harding strove to improve them. He both conveyed a sense of the importance of knowledge as a catalyst in the cause of the achievement of high standards of practice appropriate to the job in hand, and through his journal *Typo*, went to considerable personal lengths to impart to the printer the means for their attainment.

The benefit of the attainment and maintenance of acceptable standards in the printing trade was an enhanced ability for successful participation in the ever widening global market place of print. It was the strong cultural allegiance to Britain that meant traditions and standards originally inherited from that place were those that in New Zealand tended to remain the dominant measure, even though leavened by factors such as local business experience and diverse overseas influences. However, one effect of an initial inheritance of standards that were forged in Britain was that an orientation to the parent culture as a model helped to perpetuate cultural ties.

Within the global market environment, it has been seen that some aspects of demand for particular standards pertaining to printing and print products were beyond the capability of local printers in a small isolated country, and this tended to minimise the local production of some print genre in colonial New Zealand. In a market which did not possess the economy of scale, the more expensive higher standard colour printing, such as that required for finely printed colour books, was rarely possible here. Rather, throughout the period under study, it was the cheaper job printing destined for the local market for which the more expensive processes were not necessary that more often provided viable business options for the colonial printer. When higher standard colour printed books were attempted in New Zealand, the more limited market acted as a limiting factor on edition size, reinforcing the established tradition of sending offshore for such printing and marketing, even for those books with local content. In New Zealand, it was not until after the period under study that technological ability allowed colour printing to become a viable option for that most commonly desired print product, the daily newspaper. But that printers had long appreciated the ability of colour to woo this market was evidenced by the provision of colour in association with the weekly newspapers, although almost always confined to annual productions and special numbers. A compromise had been struck between the desire for colour, the technological ability of the local printers to viably provide it, and the cost.

19th Century Colour Printing Standards: the Influence of Robert Coupland Harding

Robert Coupland Harding's series 'Design in Typography' had appeared in *Typo* in the eighteen eighties and nineties, around the time that New Zealand colour printers were beginning to make a greater use of colour in their work. Within this series of typographical articles, in which Harding treated numerous facets of the subject, much teaching was of direct relevance to the colour printer. Rooted in the fact that Harding believed implicitly that the principles of design should guide good practice in any printing work, this series was at the time educationally among the leaders in the field, and in being so, was disseminating

material that was potentially instrumental in raising printing standards. In his discussion of the series as a whole D.F. McKenzie mentioned that "a leading English typefounder, writing in the early 1890s in praise of Harding's originality and authority, claimed that 'For the future historian of type-founding of the present generation we shall certainly have to go to New Zealand.'"¹²

Typo's Influence

In the December 1890 issue of the *Paper and Printing Trades Journal*, where reference had been made to R.C. Harding's reviews of new fonts and ornaments in the course of the articles, it had been implied that Harding had greater access to specimens than did the English trade journals:

It might be thought that a writer situated so many thousands of miles away from England would be at a disadvantage in dealing with such a subject. On the contrary, Mr Harding is more favoured than his contemporaries at home. As is well known, the Associated Founders have entered into some kind of compact to ignore the English trade journals. Not long ago, one of the most eminent London firms was applied to merely for specimens for notice of its new fonts, with the result that however agreeable it would be individually to comply with the request, owing to this arrangement, it must be declined. The effect of this is that while we have opportunities of noticing the many American and German importations of those firms, who are doing a large and increasing trade in foreign types, we are precluded from noticing home products. Mr. Harding is not subject to this disability; he is kept well posted up with specimens and specimen sheets.¹³

However, Harding later commented that in fact he had to purchase the samples he reviewed, including those from houses other than those in England. Apart from a very few items from the Patent Typefoundry in London, he said, "from the English Associated foundries...we have not received from them one single sample type or ornament. All that we have shown is from our own private stock."¹⁴ However, as part of the discussion, the *Paper and Printing Trades Journal* had acknowledged Robert Coupland Harding's calibre, and at the same time had paid tribute to his great experience:

Possessing remarkable knowledge and discrimination, the result of long experience, he avails himself of his opportunities greatly to the advantage of his readers.¹⁵

By the fourth April issue of *Typo*, Harding was able to report:

The reception *Typo* has received from the go-ahead printers beyond the Pacific has been very gratifying to us. There had not been time when the mail left for many of our exchanges to respond; but the notices in those to hand are of a very appreciative kind, as are also private letters from some of the prominent men in the craft. One of these gentlemen, who conducts a leading trade organ, notifies us of his intention to "steal" from our columns "with persistent regularity."¹⁶

Harding also commented that gratifying feedback had come from heads of typefoundries "whose names are household words."¹⁷ The observation made by the *London Printers' Register*, that "the advertisements in particular are neatly and effectively displayed, and the variety of types and ornaments used is evidence of the completeness of Mr. Harding's office," was mentioned in the second 1888 volume of *Typo*.¹⁸

In the article 'New Zealand. Some Phases of the Craft in the "Greater Britain of the South"', written especially for the *British Printer* and published in number 9 (1889), the Wellington journalist Tom L. Mills further brought Harding's trade journal to the attention of the readership, by mentioning *Typo*, "our only trade journal" in connection with Napier, and characterising R.C. Harding as "an old colonial and an enthusiastic lover of the craft."¹⁹ In the next issue, number 10, it was reported that New Zealand was represented for the first time as being listed in the forthcoming *Printers' International Specimen Exchange*, the entry referred to being for "Harding, R.C., *Typo* Office, Napier, New Zealand."²⁰ In comparison, at the time, there were more than fifty continental firms listed. New Zealand was far from being equally represented numerically in this aspect of international print culture, but Harding was not daunted, in fact, he had already increased exposure of his journal in the international arena by giving it a presence at influential exhibitions: in June 1888, Harding had reported "*Typo* is represented at the great newspaper exhibition at Aix-la-Chapelle, and at the exhibition of the world's trade journals at Leipzig."²¹

The fact that many of the advertisements published in *Typo* were repeated many times suggests that they were worthwhile to the businesses inserting them, in turn suggesting that the trade was reading this journal. However, it was more economic for the printer to keep type standing for many such items, enabling repeats to be discounted, and, as Kathleen Coleridge has suggested, continued repetition of three- or four-line advertisements could indicate that some were being used as column fillers.²² Although actual circulation figures were not given at this stage, within advertisements placed by Harding to advertise *Typo* itself, the indication was that by 1889 *Typo*'s circulation in the Australasian trade had become wide:

TYPO, a monthly trade journal and literary review, published on the last Saturday in the month. Circulating throughout the Printing, Bookselling and Stationery Trades in New Zealand and the adjoining colonies...²³

In August 1891, Harding wrote that although *Typo* made no financial profit, it had been directly influential regarding the formation of the Master Printers Association in the chief centres, as well as in the establishment of the New Zealand Institute of Journalists. It had been recognised by the Typographical Association as "the organ of the craft", after efforts to establish its own trade organ had failed, and by its free discussion had brought improved understanding between employed and employers. Harding said that *Typo*'s subscribers were nearly all working printers, but urged that master printers ought to actively try to increase its membership, since many of them were "now profiting by our efforts."²⁴

Typo was made available in public libraries, so that potentially it reached an even wider readership than those who did subscribe. By 1889 Harding advertised that "*Typo* is forwarded to every Public Library in New Zealand, thereby reaching the whole reading public..."²⁵; by then there were 300 public libraries in New Zealand. Harding had appreciated that there was a potential readership in Australia, noting in November 1887 that "in the whole of the Australian colonies there is no other periodical occupying a similar field".²⁶ A little later, in March 1888, he commented that the positive feedback for the journal was confirmation of its usefulness in Australasia, and also of his aim to be of practical help to the industry in setting out *principles*.²⁷ By 1892, Harding was able to say that his journal was available also throughout Australia: "*Typo* goes to principal Public Libraries in the Australian Colonies"; and that it was growing in influence besides: "it is read, and its articles are quoted, in all parts of the world."²⁸

However, an increasing circulation was not only a necessity for a wider influence, but also to maintain economic viability, and to enable its development. In the second year of the journal, Harding tried to boost circulation, expressing the situation thus:

Excluding our supplement, the [June 1888] number of *Typo* is the largest yet issued. With four additional pages, we have still to "throw overboard" much interesting matter. Whether our paper shall permanently increase in size is a matter which rests entirely with the trade...²⁹

By November 1891, Harding reported that *Typo*'s circulation stood at 500 in the colonies, whereas, he said, it should be 5000; the discrepancy was caused by many people passing it on to others in what he termed an "exchange circulation", and this had cut down the number of subscribers.³⁰ In addition, the return from advertising had become disappointing:

Advertisers, both colonial and foreign, have been far less liberal than we could reasonably have expected, considering the wide and profitable field in which *Typo* is the sole representative of the Craft, and it is on the subscribers that we have to rely for the support of our enterprise. Our friends should bear this fact in mind.³¹

In the same year, in May, the proprietor of *Typo* had stated that because of the lack of profit, "henceforth we intend to confine our actual outlay upon our journal within the limits of its returns." By December 1892, Harding cut costs by dropping the literary page and reducing *Typo*'s size from about twenty to eight or so pages. He made the comment that a problem he faced in common with many other periodicals of the times, was that subscribers were often in arrears with payment. It is clear that for R.C. Harding, *Typo* had brought fame but not fortune. Despite such difficulties, this was the same year in which Harding had announced that colour printing was in future not to be confined to the title-pages of the journal, but that the intention was to extend its use:

Typo is now printed on a fine quality of paper, and color is for the first time introduced. We will now be able to display still more effectively the specimen lines and ornaments sent to us by our friends the typefounders, and to do full justice to their two and three color designs.³²

The Voice of Experience: Principles of Design as Applied to Colour Printing

Through comment, advice, judgement and example, which was sustained over the period in which *Typo* appeared, R.C. Harding not only explained methods of procedure but also the principles that lay behind the rules. In his enthusiasm for his subject, Harding gave practical advice to printers, including to colour printers, that would assist cost effectiveness in the business situation, while setting out guidelines that would underpin a general rise in standards of practice, the latter seen by him as in many instances a pressing need. Throughout the series, 'Design in Typography', or 'The General Principles of Display Work and Ornamental Composition'. R.C. Harding laid importance on what he considered to be the major principles governing design in general, the twins of harmony and contrast, pointing out numerous ways in which they could be usefully applied to printing display work. He held that all other considerations should be subordinated to these two principles, which he explained at length as the series progressed.³³ Since all print products were ultimately created for use and appreciation through the visual faculties, Harding considered that matters of design and layout were important to aesthetic standards. In January 1894 he reported on a lecture on printing that had been given by William Morris, who had pointed out that while attention to such matters was aesthetically significant—"important to give pleasure to the eye,"—it did not need to add to cost.³⁴

In the first issue, heralding the series to come, Harding promised in future articles to cover such topics as composition, the just distribution of light and shade, the principles of harmony and contrast, decoration (how to deal with the abundance of materials available to the printer by then), and the use of elements, (such as rules and corners) which he said had not yet been dealt with adequately by either English or German trade journals. Harding commented that he himself had developed the general principles he advocated, and that his instruction was original: "we are not indebted to any preceding writer."³⁵ However, by this time, the influence of M.E. Chevreul (who in 1839 had written the important work *The Principles of Harmony and Contrast of Colors and Their Applications to the Arts*) in the wider field of art was evident. Principles to be observed by the colour printer were discussed as a part of the series that followed in succeeding issues of *Typo*, but insights on the subject were afforded in many other ways, for instance, through such avenues as practical advice, hints and examples that were printed in its pages. In general terms, Harding firstly advocated attention to simplicity of design. At the same time he explained how such basic advice could be applied to a specific job, suggesting, for example, that when a compositor was setting an advertisement, the limiting of type sorts to those found in a

single fount would prove beneficial to the design. Secondly, Harding fostered the view that a printers' training should include the topic of artistic appreciation and perception.

In the first issue, in what was to be a regular column, 'Trade Wrinkles', Harding discussed the first great principle of design: 'contrast', with a warning to underpin his advice:

Gray sets off a color better than either black or white. White, gold or black will serve as an edging to any color. A white ground has a tendency to make colors upon it appear darker, while a black ground has a contrary effect. In the association of two tones of one color, the effect will be to lighten the light shade and darken the other. The fact that incongruous colors are often harmoniously combined in nature is no guarantee that they may be similarly applied in art.³⁶

In the third issue of *Typo*, under the heading 'Harmony in Display' Harding stated that:

Contrast and harmony are the two great regulating principles of display, and under these heads all effects of form, color, and light-and-shade may be classified. Without contrast there can be no display; without harmony there can be no artistic effect.³⁷

To illustrate the concept of contrast, he cited the example to be found in the greatest proportion of all printing—black on white, while giving as a "typical and beautiful instance of harmony of color" the example of ultramarine ink used on azure-tinted paper.³⁸ If 'contrast' was made the dominant factor in a design, he said, the printer could expect quaint, striking or bold effects to be the result. Harding warned that the use of 'contrast' effects were more liable to abuse than were attempts to create effective 'harmony', which he said was capable, antithetically, of producing a quiet, graceful and dignified appearance. Commenting that German printers and punchcutters of the time often excelled in the use of harmony, and the Americans in contrast, Harding said that in general, he felt that "where harmony is the leading principle of display, either in form or color, or both combined, there is room for more subtle and beautiful effects than where contrast is sought."³⁹

Discussion of principles was linked by Harding to work that was likely to be required from the ordinary New Zealand job printer. He pointed out that style should be determined by the nature of the job, and that in printing such items as, for example, admission tickets, programmes or menu cards, all of which gave scope for some tasteful use of borders and ornaments, "decorations in general should always be in harmony with the types employed."⁴⁰ In the April 1887 *Typo* issue, Harding made 'Contrast in Display' the focus of discussion, advising that "contrasts may be bold, but should not be violent." "And," he said, "we may add that this rule, like every other relating to contrast and harmonies, applies to color as well as to form."⁴¹

Stating that "it is chiefly the ignorance or neglect of these principles that makes such a dismal failure of 19/20^{ths} of the litho work executed in this country,"⁴² Harding recommended that printers study the tenth issue (1888) of *Roundabout Papers* for valuable

hints concerning light and shade in drawing. In emphasising that in attempting decorative work, all printers should aim for simplicity, unity of design and harmony of effects, Harding cautioned those using colour, saying, "Can anyone forget the horrors of the outbreak of Japanese ornaments in every color of the rainbow six or seven years ago?"⁴³ He explained that he was not against innovation, but that often the beneficial influences of the new could not be appreciated until early extreme manifestations of a particular trend had passed. For instance, it had not been until the extravagances of the aesthetic movement had passed, he said, which had been "marked by ludicrous affectations and absurdities," that it could be seen that the departure from stiff formality had led to an admittance of more original styles. As an example, he cited the improvement made to book covers that had become possible through the employment of the new-style woodcuts.⁴⁴

In *Typo*'s pages, Harding reported on whatever came his way that he deemed worthy of the practising printer's consideration, often with his own assessment. For instance, in discussing border styles from Germany, he said that the use of some of these could yield exemplary work: "Effects, from the simplest and quietest materials, elaborately wrought out in gold, colors, and tinted grounds, are magnificent." Harding also pointed out a German idea that he thought had merit: "A favourite device of theirs is to surround the plain or more solid border with a "spitzen" or printed design which answers the same purpose as the tint, in softening off the outlines."⁴⁵

As well as proffering his own advice, in the bid to improve standards and give practical help, R.C. Harding published information from a host of other reliable sources. Instruction in such important matters to the colour printer as the thinning of inks or grinding of tints was also given, timely advice, especially in the colonial printing environment where much color experiment was by then occurring. Because of the perception that "the management of inks" was a subject perceived to be "little understood by many printers," hints from "an American contemporary" on this topic were published in an early *Typo* issue. Referring to coloured ink as "a specialised paint," Harding said that he considered the poster or handbill in particular was a class of work requiring more than the usual small amount of color to catch the eye: "they should be charged with color." Elaborating on the reason that some colours were little used by printers for such items, Harding suggested that it could be because such a colour "always looks pale and ineffective on paper...such as the various yellows." In such cases he advised that to give more color, an item could be run through the press a second time. He said that color itself, "in its various modifications with red and black, is very effective, as can be seen by looking at the leaves of trees in autumn, which are

compounds of green, brown, red and yellow..."⁴⁶ It was the ink that was seen to be the problem rather than the colour itself. Considering that a contributory factor to such poor results could often be the presswork, which he said was "often lacking," Harding also gave practical hints to address this problem.

R.C. Harding placed high regard upon the observance of the principles of design when planning any printing job. In reference to the challenging nature of work required to produce a well-printed book, he said that the compositor who could make the best use of the variety of letterpress elements at his disposal and "so arrange them that each part has its proper size and place, is a more skilful workman than he who can twist rules or print in many colors."⁴⁷ That he appreciated the strong link between excellent work and the fair treatment of the worker in any department of printing was shown in the comment he made on a resolution passed in 1891 by the Wellington Trade Council. This resolution held that liberal newspapers should be established in the principal cities to ensure that the interests of the working classes of the colony were promoted, but Harding said he thought there was "a better and more satisfactory method..." He advocated instead that the Trades Council should "use all their influence, regardless of political parties, in favour of that independent section of the press that practically [ie in a practical way] encourages Unionism by paying fair wages and turning out high-class work" arguing that both the Trade and wages could gain a sounder base by giving support "to the employer who deals justly and honourably with those in his service."⁴⁸

Leading by Example

Advice on some aspect of the printers' art was often accompanied in *Typo*'s pages by example, frequently chosen for direct practical value. For instance, when discussing layout, advertisement design was chosen for discussion because Harding perceived this class of printing was "so far as ordinary printers are concerned, the largest and most profitable part of their work."⁴⁹ On this aspect, Harding's own practice within *Typo* itself was recognised as exemplary, for instance, the *London Printers' Register* had commented: "The advertisements in particular are neatly and effectively displayed, and the variety of types and ornaments used is evidence of the completeness of Mr. Harding's office."⁵⁰ Colour advertisement supplements sometimes accompanied *Typo*, beginning with volume three in 1889 for which advertisements appeared in green/blue and dark red. Other colour-printed advertisements were supplied as inserts, for instance a foldout showing specimens of new fancy brass dashes from Gould and Reeves of London that was printed for that volume in dark blue.⁵¹ The reiteration of the importance of understanding the principles underlying

design decisions was constant. In the second issue of *Typo*, Harding reminded printers that principles governing the effective use of light and shade were not only to be followed for a newspaper advertisement, but were equally relevant to a title page.⁵²

Harding's own colour work, seen in *Typo*'s title pages, was immediately in evidence to printers. Such examples worked in colour enabled them to not only profit from Harding's expositions, but also to judge effects for themselves. The colour printing for the first volume title-page which appeared in red, blue, black and grey, had received a favourable overseas review in the *London Paper and Printing Trades Journal*. While describing *Typo* as a "carefully printed and well-edited" journal, the volume one title-page had been especially noted as being "a masterpiece of well-balanced ornamental typography in colors."⁵³ (Plate 62.) Harding published this comment in the October 1888 issue of *Typo*, and shortly afterwards, a description of the colour printed title-page for volume two. Citing this sample of his own work (which had been printed in the same colours as for the title for volume one), as a case in which the principles he advocated had been put into practice, Harding gave the following details for the benefit of colour printers wishing to achieve similar high standards:

In its design and scheme of color, we have followed the principles of harmony and contrast laid down in our article on p.15 of our first volume. The nine lines of plain roman harmonize—ornamental letters would be out of place, detracting from the effect of the border: and the two lines of black supply the contrast. In the arrangement of colors, the three qualities of blue-blue, blue-black, and blue-grey—harmonize, and the red—in very modest quantity—comes in by way of contrast, besides emphasising the main line. The fine head-piece is by Flinsch, the handsome shell by Bruce; the vignette is our own. The interior border at the corners is by Poppelbaum; the "Pompeiiian" mosaic groundwork by Brendler & Harler; the tablet border in the middle of the page by Stephenson & Blake; the exterior borders, corners and architectural ornaments, Schelter & Giesecke; the brass-rule by Berthold; roman and old english lines by four of the English associated foundries.⁵⁴

Marking Harding's shift to Wellington and demonstrating a new asymmetric style, the title page for *Typo*'s 1891 volume five, printed by Harding, Wright & Eyre in green, red, navy blue and light yellow, stands out as a particularly fine specimen. (See plate 19: chapter 7.)

As he put examples before printers, Harding was not afraid of unfavourable comparison and made use of both the good and the bad to illustrate a point, sometimes in an article that he had contributed to another trade journal. For example, in the article published in *The Inland Printer*, as recorded by D.F. McKenzie, Harding had criticised the fashions of the times, saying that one readily encountered such things as "experiments in new forms, shapes and

Plate 62: Title-page: *Typo: A Monthly Newspaper and Literary Review*, 1 (1887).

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Ref. No.: B-K 408-TP-

TYPO

A Monthly Newspaper and Literary Review

DEVOTED TO

THE ADVANCEMENT OF THE TYPOGRAPHIC ART
AND THE INTERESTS OF THE PRINTING, PUBLISHING, BOOKSELLING, STATIONERY,
AND KINDRED TRADES.

VOLUME I.

Napier, New Zealand:

PRINTED AND PUBLISHED BY B. COUPLAND HARDING.
1887.

styles, the variety of uncouth faces which in many cases take the place of the traditional roman character in the text, the eccentric vagaries in the arrangement of headings, initials and decorations, the monstrosities in massed black and white, or, worse still, in colour, admitted in the name of 'decorative art' ..."⁵⁵ On the other hand, Harding regularly drew attention to examples of work he considered to be of merit. Such examples had often been received from overseas. For instance, in October 1887 Harding cited two finely printed specimen books that had come from Haight and Dudley of New York. From these he pointed out the example 'Easter Hymn' as being "tasteful although simple"; noted the interesting specimen, "a six-block engraving, shown in all its stages,"; and remarked that "in the later volume there is a varied selection of styles, including some fine examples of rule and color work."⁵⁶ In the same month, Harding made special mention of copies of *The American Art Printer* to hand which he said contained "some beautiful reproductions of paintings and drawings by the "Ives" and other new processes," mentioning also that "this paper marks the highest level yet attained in American art typography."⁵⁷ From the wide range of overseas publications for the printer which Harding took, some such as this one were selected for mention as leading by example. At this time, Harding also pointed out the August 1887 issue of the *Philadelphia Paper and Press* as being "a magnificent number of 96 large quarto pages, faultlessly printed" and which, he said, "contains fine specimens, in black and tint, of the new processes of photo-engraving."⁵⁸ In 1891, Harding reviewed several new "lithographic organs," including the *British Lithographer* (printed and published by Raithby and Lawrence) and the *Philadelphia Lithographers' Journal* which he noted as being superbly printed and illustrated. In naming *The Lithographer*, the *Artist and Engraver* and *Magazine of the Graphic Arts* as coming from London, he said that the last was an improvement on the *London Printing Times* which it succeeded, noting that the editor was W.D. Richmond, author of *The Grammar of Lithography*, which, he said, was "a sufficient guarantee of its technical excellence."⁵⁹

In the pages of *Typo*, R.C. Harding also critically discussed examples that he received from local printers. For instance, in the realm of illustration, Harding mentioned a large lithographed portrait of the "late Sir Donald McLean" that had come from A.D. Willis, saying that although he thought it good, nevertheless "the artist has given a somewhat severe likeness to the countenance." With regard to school reading books for Standards II and III received from Whitcombe and Tombs of Christchurch, his opinion was that, "the printing and engraving [was] of the best class," and that, although he did not like the old style type, he said he was "glad to see good illustrations and descriptions of native birds and

plants.”⁶⁰ If he saw excellence, Harding pointed it out, especially excellence in design. For instance, he held up the annual *Otago and Southland Directory* of 1888 that was published with large folding maps by Stone, Son & Co., in Dunedin as a model, saying that for completeness and excellence of arrangement it was the best in the country, and had “never been approached by any other publication of the kind in New Zealand.”

In reviewing local colour work, Harding often referred to the New Zealand colour printers responsible for the examples he had received. For instance, he mentioned the art compositor and machinist, Mr. A.J. Cuming of the Christchurch Press Office, from whom had come a two-page quarto circular “setting forth the merits of his new “Planet” roller composition [that was] displayed in colors and adorned with Schelter & Giesecke’s ornaments and McKellar’s Chinese border.” Describing it as demonstrating “some ingenious and effective work in rule-curving,” Harding commented however, that “the “ribbon” paper on which it was printed marred the effect of the work, the ridges breaking up the lines into dots, and giving a rotten appearance to the finer ornaments.” He advised that “on smooth paper, the job would have looked better.”⁶¹ However, a colour-printed sheet almanac received from the West Coast in early 1890 was judged by Harding as “a sad example of over-ambitious work.” He explained his harsh review: “The red, in which the greater part of the job is printed ruins the whole, completely filling up the types. The register, too, is all out.” In this case he advised that it would have been both cheaper and better to have printed the whole in black.⁶²

But around the same time, Harding was also receiving examples from New Zealand colour printers which he considered worthy of praise. As well as the colour printed items of a good standard that he had brought to attention in the pages of *Typo* in 1890, and that were mentioned in chapter 7—the colour printed clearance card from the Canterbury Times job room, the colour testimonial also printed in Christchurch, and the business card printed in colours from Timaru; also favourably mentioned in the same year was a large tear-off calendar printed in red and black by Whitcombe and Tombs that featured “a pretty vignette of the native tui or parson-bird in the upper left-hand corner.”⁶³ A Christmas card described as “neat and harmonious” in three colours that had been sent by the staff at Fergusson and Mitchell of Dunedin was pointed out as the work of Mr McIndoe, “whose taste in display” Harding said, “has already been noted in our pages.”⁶⁴ Another favourable comment on a colour sample, this time received from the North Island office of the *Napier Telegraph* had appeared in 1890. The item was “a finely printed programme” consisting of four quarto pages in blue and gold. Harding mentioned that his home city of Napier “has for years past

been quite abreast of the big cities in the matter of high-class printing, and the specimen before us does credit to both Mr. Timperley, in charge of the job room, and to the

[illegible]

other models to emulate at this time, Harding suggested to the colour printer a list of specimen books published by Hedeler in 1891:

Printers who wish to add to their technical library, and designers, engravers and lithographers in search of good models, will do well to study [this list]... We doubt whether so fine a collection of specimen-books is to be found elsewhere.⁷²

Instructive examples were sometimes drawn from the neighbouring Australian colony. A colour printed item that Harding had singled out for special mention in mid-1888 was the Melbourne Typographical Society's new member's certificate, which he described as a prize design of large size in five workings consisting of "three ground tints, yellow, pink and blue, very lightly produced, the outline of brass rule being worked in gold, and the lettering being brought out in red on the white ground." He added:

The society is to be commended for leading the way in fancy printing. We can never expect the public to patronize the higher branches of our noble art unless we shew them by our own example that we encourage the artists who produce such work.⁷³

Also from Melbourne, Harding mentioned the "neat lithographed card in two colors, adorned with native flowers, with a sketch of the fine offices of the *Argus* and *Australasian*" that he had received in 1890 from that office.⁷⁴ In noting copper-plate and lithographic specimens printed in volume 10 (1889) of the *Printers' International Specimen Exchange*, he had stated: "we specially note an excellent landscape in colors by Tröedel, Melbourne," (although arguing that they seemed a little out of place in a typographic work).⁷⁵ When subscribers' parts of the Cassels *Picturesque Atlas of Australasia* had arrived for him, Harding commented on the most artistic bookwork, saying: "This is the most magnificent piece of printing ever attempted this side of the equator, and one of the finest illustrated books in the world." Mentioning that his criticism at first had been directed to the lithographed borders around the fine plates, he said that they had now been, in his view, wisely discontinued. In 1889, when the work had been completed in four volumes, the last of which included much on New Zealand, Harding noted the "fine colored diagram of the solar system" although saying that he considered it, also, to be "curiously out of place in a work of this kind."⁷⁶ Pointing out in 1892 that *Typo* was the only record of the contemporary Australasian Press, Harding made the comment that it was still, however, deficient in respect of Australian items.⁷⁷ Perhaps prompted by that comment, a few months later an item was sent by Sands & McDougall of Melbourne:

Plate 63: 'Potona: Or Unknown New Zealand.'

Three-colour pamphlet cover printed by Harding, Wright & Eyre, Wellington.

Published in *Typo: A Monthly Newspaper and Literary Review*, as a supplement, 6 (24 Sept., 1892), 72.

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Ref. No.: S-L 365-

From the companionship of Sands & Mc Dougall, of Melbourne, we have a striking Christmas card, in rule-and-tint. A cupid and an easel are the principal features of the card, which was designed and composed by Mr. J. Wighton, upon whom it reflects great credit.⁷⁸

Other examples of colour printing came from further afield. For example an illustrated catalogue received from the English firm Raphael Tuck and Sons, *The Golden Age of Christmas and New Year Cards*, was recommended by Harding as indicative of the "marvellous and increasing variety" produced by the firm: "in this class of work" he said, "they stand at the head of all English houses."⁷⁹ In 1888, Harding had received two specimens of colour printing from Green & M'Allen that had been designed and executed for the Apprentices Exhibition in London. Describing them as "far ahead of most of the color-work done in this country," he said the design and harmony of colour in the first item, in four colours by Harry Gadsby, was excellent; and that the second, also in four colours, by E.A. Hodges, demonstrated excellent taste and a good management of colour.⁸⁰ In his typographic series article on 'Ribbon Developments' in 1890, R.C. Harding commented on the role of good teaching and training in raising standards. He referred to an 1879 article in which the opinion had been expressed that "the absence of artistic taste in the British workman has never been more conspicuously displayed than in the many grossly absurd designs which we have seen perpetuated with Ribbon Type, Banner Border, and Combination Flowers." However, he observed that because of the study of drawing in the national schools, there was hope of improvement, commenting that even in the eleven years since the article "the artistic quality of English printing has decidedly improved."⁸¹

For the Antipodean printers, recourse to manuals and other reference books was one way in which extra education could be obtained. In his *Typo* columns Harding often referred to texts that he felt would be of use in this regard, for example, one that he pointed out in 1891 as containing up-to-date illustrated articles on colour work was the *American Dictionary of Printing and Bookmaking* that had been published by Howard Lockward & Co. of New York. Mentioning that the editor was Mr Pasko, the librarian of the New York Typothetae, Harding said that this work was necessarily based to some extent on the labours of Savage, Southward and Ringwalt, and that it promised to be one of the most important books of reference for the Craft. Focussing on one of the illustrations that had been given for an article on colour printing, Harding described it in detail, referring to it as "a complete color multiplication table" which had been produced in eleven printings to represent one hundred and ten colours and shades.⁸²

Articles of particular value from experts were sometimes obtained by Harding for reprinting in *Typo*, and others were extensively reviewed. Included in the second category was the article written on the subject of colour printing by Mr. Earhardt, one of the two proprietors of the *Superior Printer* in which an article had appeared accompanied by a plate showing six art colours that had been produced using a combination of inks in the colours rose lake, lemon yellow, bronze blue, and black. Harding commented that all art printers would appreciate the value of the sheet because of the difficulties that were commonly experienced in matching shades, causing colour printers to waste much time and ink: guidance was sorely needed. He said one problem had been that "it is the property of black so to disguise the colors mixed with it, that without considerable practice, the pressman scarcely knows how to begin."⁸³ He went on to explain that although a dispute as to theories of complementary colours was in progress between Mr Earhardt and A.V. Haight, he considered Mr Earhardt to be doing printers a service in giving them the benefit of "his own taste and long experience." Six more art colours, that is, each colour mixed from combinations of three nominated colours, were expected from Mr Earhardt in the future, with guidance as to the proportions necessary to reliably obtain them. Later, when mentioning recent exchanges he had received, Harding pointed to an example of Mr. Earhardt's own colour printing as the embodiment of excellence. The item had been produced in thirty-six colours after five workings:

From Liberty Machine Works, N.Y. we have a business card, the most remarkable piece of color-printing that we have seen. It is by Mr. Earhardt and is one of the illustrations for his forthcoming work on color-printing...on a square, gold-bordered, and set in, lozenge-wise, is a pansy, in natural colors.⁸⁴

Harding stated that Mr Earhardt was an acknowledged master.

Explicit technical information from such experts in the craft was sometimes published in *Typo* by Harding to help dispel the atmosphere of secrecy that often surrounded printing processes, many of which were at the time experimental, although protective attitudes were understandable when many processes were commercially sensitive, with their inventors perhaps awaiting patents. Such advice for achieving excellence in various branches of the colour printers' art was given in *Typo* in 1891, when three articles from the local colour compositor Ernest Wright, of Lyon & Blair were printed – the first 'On the Use of Bronze', the second 'On the Use of Tints' and the third exposition entitled 'Primary Colors, Tints, Shades, and Secondaries'. This man understood the colonial printers' need for detail. The first article pointed out that at that time the use of bronze was considered "almost essential to high-class work", as "scarcely any specimens of five color-printing are devoid of gold, as it can be used in conjunction with any one, two or three colors without destroying their

density or blend". Pointers were then given concerning the important colour printers' tools, rollers and ink. Printers were advised that rollers should be "well-seasoned, made of glue and treacle, and slightly sponged before putting on the machine." Concerning inks, Wright advised what to use, and how to obtain the best effects:

For gold, yellow chrome, and mid- or thin-varnish, but a great deal depends on the quality of the paper used; and for silver, a pale blue, consisting of flake white, mid-varnish, and just enough ultra-marine to bring it to a light sky-blue. Copper and fire-coloured bronzes should be used over a slightly red or warm ground. A few drops of copal varnish added to the ink will cause it to dry harder, and there is less likelihood of it rubbing off; but never, on any account, thin the color with oil. Not only does it destroy the adherent qualities of the varnish, making the work patchy, but it spoils the bronze, which turns green, and loses its lustre...For instance, take a job worked in three colors—gold, blue and red. It is absolutely necessary that the gold, to be in contrast to the red, should be of a brassy color, or light. In this case, the chrome-yellow should be used; but in working gold by itself, on white enamel card, a little red or vandyke will bring out the bronze, and wonderfully improve it.

Ernest Wright had not underestimated the importance of choosing qualified staff for the work, and described the havoc that could occur if care was not taken in this respect, to say nothing of the health risks:

We must select our boy to apply the bronze. Let me state here that although this is the most particular part of all bronze-work, it is, without exception, performed by the most inexperienced "devil" in the establishment, who is generally borrowed from his "cully" in the machine-room, and in less time than it takes to relate, is unrecognisable amidst the cloud of bronze which he sets afloat to cover himself and spoil the ink-tablets and rollers of all the machines in the room. The bronze should be applied by a person qualified to watch the color, and should never be left to the mercy of the boys, who will smudge more sheets and waste more than would pay for a competent hand, apart from the risk they run of poisoning themselves and everyone else in the press-room.

Details of correct procedure were then given:

To maintain the greatest amount of brilliancy in the work, the powder should be applied with a piece of soft cotton-wool, only enough being taken up to cover the lettering with a solid coat. This should be gently rubbed to polish the surface, and passed to a boy to lay out, or if the copal varnish is used, to dust-off. The great secret in good bronze-work is to use as little powder as possible, and to rub lightly, and well-polish it after applied. By using a small brush and a spot or two of benzine to rub off the form every now and then, the work will be kept from filling up, and the color improved.⁸⁵

Advice by E.E. Wright 'On the Use of Tints' was printed in *Typo* in 1891. Wright defined a printed tint as "a considerable surface of color applied to the paper as a groundwork to the whole or portion of the job, to bring out some prominent feature in the design" and then went on to give the colour printer much information to enable their succesful use. For example, he advised that:

Where a considerable portion of the job is to be tinted, and bright colors are to be used for the lettering, it is always safest to use a tint in which the primary colors do not appear. For instance, drab, gray, or slate produce a very good effect when used with almost any shade of red or green; but should the lettering be of black, blue or any cold dark color, the tints should be warm—say orange, pink or lavender...To obtain the greatest advantage from the use of any tint, its margin or edge must be clearly defined by a positive color, and where two tints meet, they should be divided by a darker line, which gives a finish to a job.⁸⁶

Appreciating that because tint-work was at the time so very little used in typography in the colony, few offices would keep stocks of tint-inks on hand, Wright advised that excellent tints could be produced from the colored inks found in every well-furnished office, by

adding flake-white, or even ordinary varnish. Experimentation with colour was advocated in Wright's third article on colour printing in the June 1891 issue of *Typo*, in which he suggested many combinations that could be tried in order to observe the effects, saying:

It will be seen by these remarks that a study of color is necessary before any reliance can be placed upon the appearance of the combination before it is printed, and that in every instance, where it is in any way possible the colors should be brought into juxtaposition.

Wright explained that the colour printer's first need was a working knowledge of the positive colours, which should precede attempts to succeed with tints, and that printers should in the end use their own judgement rather than simply repeating suggestions that he might give:

The use of tints being entirely subordinate to that of positive colors, the remarks "on tints and their use" would be of little or no value to those who are entering upon the study of colour-printing until we have given some idea of the positive colors, hues, shades or tones that co-operate in making a complete and artistic piece of work. It is not our intention to produce an elaborate table of colors in pairs, triplets, &c. but simply to give what little information lies in our power to those who take an interest in their profession, and are desirous of bringing their work up to as near a state of perfection as possible. We do not give the results of the experiments we have tried as absolutely correct. We may not consider the combination of certain colors to be so good as others might, and *vice versa*...

However, Wright did give some specific combinations as food for future experimentation and suggestions that might be tried with good effect, perceiving that they were not pairs that would ordinarily come to mind, while also stressing the importance of the substrate:

We will give a few of those colors which, when worked in pairs, produce a pleasing combination, and which we have seldom seen used, viz.: orange-red with violet or turquoise blue; orange with violet-blue or blue-green; scarlet with turquoise or light blue; red with greenish yellow; greenish yellow with purple or normal blue; and others. In all combinations of colors, the card or paper to be printed must be of a tint suitable to those worked thereon. In the above pairs, we have supposed a white ground to be used; but in all classes of artistic work we prefer a tinted background.⁸⁷

A few months after this article had appeared, R.C. Harding reviewed some colour-printed specimens received from a Boston foundry: it was clear that New Zealand colour printers were not alone in their need of knowledge on the effective use of tints:

Dickinsons typefoundry show a large number of beautiful headpieces, vignettes, and initials, all drawn in very free and simple style, suggestive of process work...four pages of ornaments are worked on two - two forms in light tint and two in black over them. The effect is one of indescribable muddle, the ornaments crossing and obliterating each other in the most promiscuous manner. The pages look more like spoiled proof sheets than founders' specimens.⁸⁸

Advice in *Typo* directed at the colour printer was quite often intended to forestall disaster, for example, that given to encourage restraint in the use of Japanese vignettes. Harding commented that "a billhead, business card, or memorandum form is simply disfigured by designs which bear no reference to the text." Considering these ornaments very difficult to employ successfully, especially in a colour printed item, R.C. Harding thoroughly discussed the matter, explaining that Mackellar's Japanese combination had appeared in four series in 1879, marking a distinct era in type decoration: old-type designs had in the main not been

replaced until then. The unfamiliarity of such new ground had inevitably caused misuse as the experimental stage proceeded. However, if used judiciously, Harding said, Japanese vignettes could be useful in jobbing printing, for instance to ornament such items as ball programmes or menu cards. However, he advised that his own experience had showed it best to supplement such ornaments with brass rule and ordinary borders, in which case items such as birds, flowerpots and balustrades might prove useful for such items as nurserymen's advertisements and catalogue covers. However, his experience had also shown that some attempts to use Japanese combinations in colours and bronze had resulted in the "saddest perversions" he had ever seen.⁸⁹ Although conceding that "they are susceptible of effective and admirable treatment in color, [as] some of the American printers have proved," Harding said he nevertheless felt that "their successful use in this way is very exceptional." He considered that although the combinations could be striking in black, white and intermediate shades, the danger was that if printed "in patches of blue and red" with an "ill-conditioned roller, and ink of an inferior grade, all the harmonies and contrasts of light and shade are lost, and the whole design becomes a vulgar blotch." In summary, Harding advised that such combinations should only be used in black, and "unless ink, rollers and paper are of fine quality" it would be better if they were not used at all.⁹⁰

For colour printers, specific advice gleaned from experience that was often passed on in *Typo* could save time and effort in a colour printing environment where standards were far from fully developed. Concerning particular coloured inks that had often been observed to have given poor results, it was suggested that:

If you want to get the best results with blue ink, especially ultramarine, as well as the more brilliant greens, don't use hard rollers. Use good fresh glue-and-molasses rollers, and do not carry too much color. It is common to notice a mottled or speckled appearance in solid blue surfaces. In other cases a stringy appearance is seen. This indicates either too much moisture or too much oil in the rollers...Attention to these remarks will remove the mottled and streaky appearance of the various tints on the array of music titles often seen in the windows of our prominent music stores.⁹¹

Suggestions were regularly given to solve common printers' problems, and often these were as relevant to the colour printer as to those working exclusively in black and white. For instance, because it had been observed that, when working on glazed paper, it had often been found difficult to prevent the ink rubbing off, a hint proffered in *Typo* suggested that the problem could be alleviated if a good soft quick-drying ink was used and the paper placed near a stove to heat it as work proceeded.⁹² The hint "To deepen colored inks" advised that the printer should "never try to darken transparent colored inks with black, as the black destroys the transparency of any color with which it is mingled. A bright ink is best deepened by mixing dark blue, rose lake, and yellow, and adding the mixture little by

little to the original color until the desired color is attained..."⁹³ Also concerning coloured inks was the hint from a Mr Wade that was passed on from the October 1892 *Printing World* – "a remedy for the want of time." After procuring an atmospheric gas burner, and a small enamelled bowl (costing together about 3s.), the printer was directed to heat the ink, so that "you can mix thoroughly in five minutes as much color as you could half-mix in the duct or on a slab in a quarter of an hour. The bowl can be wiped out with some waste oil each time it is used."⁹⁴ For lithographers, a prize-winning hint from America that was passed on had advised: "use strong tea to keep the zinc surface or lithographic stone clean," remarking also that it worked better than either tobacco or beer.⁹⁵

To illustrate the articles for the 'Design in Typography' series, R.C. Harding often published examples that he had worked himself. For the November 1891 article, 'Renaissance Borders' he said that he would have liked to have used the 'Florentine' border from the house of Schelter & Giesecke to illustrate, but that it was not obtainable in Wellington. Instead he had used the 'Akanthea' from the same house, in outline a "kindred design."

The artistic "Akanthea" of 192 characters (8 of them repeated in the Florentine), remains still one of the finest examples of the Renaissance border without background. The headpiece to the present chapter and the vertical ornament in the margin show the graceful lines and admirable drawing of the design.⁹⁶

In addition, he said, this border was furnished with a double set of tint-characters that could be used to good effect for figures and background. Harding also pointed out that such borders involved a considerable outlay for the printer who wished to acquire them: they were "as a rule costly as well as beautiful." He commented that "we have not by any means a representative selection." In fact he said, "we are indebted to the courtesy of Mr. Bock, the only printer in Wellington possessing the Akanthea combination, for the specimen types on the first page of this number."⁹⁷ These examples had been in black and white, but it had been only two months later, in January 1892, that Harding had announced his intention to use colour printing for examples, especially to demonstrate the two and three colour designs. Harding also recognised that for printers to be able to put into practice knowledge and advice imparted in *Typo*, information concerning where and how to order requisite materials such as those they had read about in its pages was a continuing problem, especially for the colonial printer who was far from the main centres of type production. It was often through advertisements that such information was laid before *Typo*'s readers (see chapter 7), but in addition, Harding gave advice on the matter in some of the journal's regular columns.

Setting Up With Types, Ornaments, Inks and Other Requirements for Colour Printing Excellence

That R.C. Harding appreciated the importance of the part played by equipment and process in the printer's attainment of printing excellence was indicated by the fact that he frequently commented on these aspects. Throughout the life of *Typo*, Harding ran a critical series, a regular column, 'Recent Specimens' in which he commented on specimens received from northern hemisphere centres, and mentioned the typefounders he considered to be leading a necessary raising of standards. In general, Harding's summary in 1890 was that the variety of types by then available was enormous, ranging from the finest work to those specimens that "set one's teeth on edge." In deliberating on the three main countries from where the printer might order supplies of types, his advice was that England was the place to go for body-letters, America for fancy types, and Germany for borders. In respect of the last, Harding advised that Schelter & Giesecke were the best, and further, of special interest to the colour printer, pointed out that "one in particular—the lovely Gothic which is equally available for one, two, or three colors—appears in many of the finest jobs."⁹⁸ In commenting on specimens of admirable job-work that he had received in June 1891, Harding stressed that, for high standard work, it was necessary for printers to keep up-to-date with regard to equipment, saying that models such as these

cannot be produced from the material of even ten years ago. New borders, pretty vignettes, and accurately-cut labor-saving rule are essentials to its production.⁹⁹

In 1892, Harding mentioned that although he did not hold an agency, his "direct communication with the leading American and foreign houses" enabled him to obtain for the colonial printers any of the novelties produced by the numerous founders who at the time had no agency in New Zealand. In addition Harding extended an invitation to printers visiting Wellington to inspect his large collection of type specimens and files of trade journals. He offered also to receive orders and subscriptions for any technical work or trade periodical in connection with the craft."¹⁰⁰

For the benefit of printers, Harding offered criticisms of available types and other equipment alongside the exposition of their advantageous use, often in the course of his 'Design in Typography' series. For example, in the December 1887 article Harding had set out rules for the wise use of initials, devices that he observed had been rarely seen until a few years previously, but that were by then "used so extensively" by printers that designers had been stimulated to produce numerous new ones. He advised that, for general and also colour work, he knew of "none to excel the 'Filigree'", a style that would be found freely used in *Typo*'s pages. Giving worked examples to illustrate, Harding continued:

It is a beautiful and legible style, harmonising equally with roman and old english, and combining admirably with the special ornaments supplied with the fount. A common style is an initial in white, on a solid or dotted ground. The larger style is provided with some of the modern adjuncts already mentioned, in the shape of separate head-and-foot ornaments, and also brass frames of various patterns, giving a massive effect in a large page, and well adapted for color-work...Initials of this class are commonly and appropriately used with old-style headpieces on a dark background. When printed in red, with the text in black, they are very effective.¹⁰¹

In the same issue, for the benefit of the discerning printer, Harding commented in 'Recent Specimens' on the relative merits of several series of ornaments that were by that time on the market:

Primrose series:- ...the large corner is very pretty, and the pica pieces are simple and neat, but the two-line pica characters, though beautiful in detail, are ill adapted for a running border, producing a clumsy effect. These pieces are shewn for working in three colors...In combinations we have the Renaissance border of 55 characters—something in the style of the "Holbein"; a grand new border for colors, un-named, containing 98 sorts...and a charming 12 point heraldic border on solid ground....We have also several sheets devoted to the display of these combinations, beautifully worked in color.¹⁰²

The following year, in the May 1888 issue of *Typo*, Harding had recommended an "exquisite border for one or two colours" that had recently become available from Bauer and Co. in Stuttgart, the "Alhambra." Informing printers that although the complete border contained sixteen characters, he pointed out that each could be ordered singly, going on to describe their efficacious use for colour work:

Three pieces constitute the characteristic part of the border; these are repeated in smaller size and are so designed as to produce the effect of three colors—white, black and tint—when printed in one color. The sixteen pieces really constitute six borders, which can be used separately or in combination. It is in the most perfect taste, and appropriate to any kind of ornamental work, large or small. The specimen sheet to hand is a beautiful piece of colour printing.¹⁰³

In 1889, when a large parcel of specimens had arrived also from a German supplier, Weisert of Stuttgart, Harding noted that among them was another border that he felt was especially suited to excellence in colour work and passed on details:

A grand broadsheet of color-printing exhibits the new Gothic border, designed by the artist Rudolf Koch, of Holstein—a magnificent and easily managed series of 89 characters, from 3 to 24 point. Exceedingly rich effects are obtained by this border, especially in color-work.¹⁰⁴

As the flow of information for the printer continued in *Typo*'s following volumes, R.C. Harding seemed to cause New Zealand's distance from the centres of excellence to recede, as he became a distributor of valuable and salutary advice from diverse sources. The link with the sister colony, Australia, was strong as Harding kept in touch with printing matters over the Tasman Sea, passing on to the New Zealand practitioners of the art whatever he considered to be of advantageous interest. Included was information on where to most easily obtain supplies. For instance, in favourably noting a colour printed circular received, Harding also publicised the Sydney suppliers: "Messrs S. Cooke & Co., printers' furnishers, Sydney, send us a circular setting forth their agencies, very tastefully printed in two colors."¹⁰⁵ Suppliers from America were sometimes mentioned too. In the April 1890 issue

of *Typo* Harding recommended the Bruce Series from New York, especially for scroll and colour work, devoting an article in his typographic series to it. First produced in 1876, essentially in six sections, he deemed it unsurpassed for artistic design and careful cutting, and especially pointed out its potential for effective use in colour.¹⁰⁶

By the early nineties, when Harding was able to print examples in colour, one chosen for such illustrative treatment was the series 'Verzierte Keilschrift' from Actiengesellschaft (Offenbach on the Main) which R.C. Harding employed to discuss the use of solid colours for display typography in the October 1892 issue of *Typo*. In this case, the examples shown were worked in red and green. The swallow ornaments from this firm also adorned the issue, in green. Specimens from the same firm later appeared in colour, this time used to print an inset on page one of the January 1893 issue announcing the seventh volume of *Typo*. On a pale green background was an easel design on which the word 'Typo' appeared printed in shadow type: a light pink face and deep pink shadows. For the October 1893 issue, a new running border from Schelter & Giesecke was featured in five colours: pink, blue, two greens and brown. Harding's accompanying comment suggested that printers could explore the development of further colours for themselves:

The new five-color Border 142...makes a beautiful border, and the solid ground-work may also be used by itself; but the variety of effects that may be produced in color-work, from two impressions up to five, would not be readily exhausted.¹⁰⁷

In the eleventh (and last) volume of *Typo* published in 1897, five pages were devoted to an illustrated account of the use of typefaces, borders, combinations, and vignettes from Woellmer's foundry, since Harding considered them to be so varied, and all original. For instance, Harding commented on the suitability for colour work of the new series of job-letter, 'Staffeta', advising that it was "apparently identical in face as well as in its four sizes with the Barnum, except that the white band is absent, the latter being solid. The two founts could in that case be used effectively in register colour work."¹⁰⁸ In this last issue of *Typo*, Harding listed several awards that had gone to Woellmer's Foundry at various trade exhibitions, including one that had been held in Sydney in 1879, and another in Melbourne in 1882.¹⁰⁹ He mentioned that he had first noticed the firm's types in 1876, through an article in the *London Printers' Register*, although at the time German founders had not begun to cast type for the English market, and at the time he had obtained "among other articles, the rivet and screw designs for one and two colours" which he thought to be original. Harding referred to the acquisition of the Woellmer's types, which had included "the fine Maurische combination" used to print the headpiece to this last volume of *Typo* in the colours of pink, deep blue and pale sage green. (Plate 64.) Delivery of the shipment had been delayed

because of shipwreck, although when finally received, it was apparently none the worse for wear: "Our box went down with the *Queen Bee*, off Farewell spit, and the types we show above lay for a month at the bottom of the sea, with little or no injury..."¹¹⁰ Of the 'Maurische' he said:

It consists of three characters only, all on square body, and is cast for one two, or three-colour work. There are two quite independent borders. The first character, numbered 1-2-3, is equally appropriate as running piece and corner, and, when printed in a light tint, it forms a good ground pattern, readily composed. The characters 4-5-6, 7-8-9, are respectively running piece and corner.¹¹¹

Commenting that he considered the recently received 1896 specimen book from Woellmer's to be "one of the most complete and beautiful ever produced by any foundry", Harding discussed the firm at length, stating that it kept fully up to the times. Harding's commentary on many of the specimens sent by the firm in 1897 was accompanied by illustrative worked examples. Borders selected for notice included the "bold series of borders 13-16" which, he said, "for gold and color work...is not easily surpassed."¹¹² Harding considered the variety of free ornaments from the firm to "include all kinds...suitable for the free decoration now in vogue," and pointed out that they were now all adjusted "with the greatest accuracy to English height."¹¹³

As to the subject of choice of coloured inks, besides the many advertisements in *Typo* from the major overseas ink-makers, including some demonstrating their printed appearance, (see chapter 7) Harding occasionally indicated how printers could otherwise compare effects of various inks. For example, when mentioning a new specimen book from Ramm & Seeman of Leipzig, for which, he said, "the cover is a choice piece of zinco-chromo printing," he particularly pointed out that "the whole book is printed in art shades, each page exhibiting some particular ink of a leading Leipzig factory...."

Processes and Other Products

R.C. Harding often noted other new developments of interest to colour printers, for instance, in 1888 he pointed out that printing inks had become available in tubes like artist's paints but that they came from Germany and not from Britain, which, he said, "is backward."¹¹⁴ An improved lithographic process that he noted in *Typo* in April 1889 he had seen reported by the *American Lithographer & Printer*, having at first appeared in *L'Imprimerie*. The new method, discovered by Joseph Eberle of Austria, purported to simplify lithographic printing on dry paper, and to enable a "hitherto unattained" sharpness

Plate 64: 'Three-colour Headpiece.'

Published in *Typo: A Monthly Newspaper and Literary Review*, 11 (1897) using the Woellmer Maurische combination.

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Type Specimens.

The finest specimen-book of the year has come to us from the foundry of **WILHELM WOELLMER**, Berlin, followed by a parcel of specimen lines so varied that more than five pages of this issue are devoted to their display. All the examples shown are original designs of the house, and they are but a fraction of those shown in the book. We have also received two supplementary books showing that the firm keeps fully up to the times, and, causing one to wonder, as we often do, where a sufficient market is found for all the novelties. At the head of this page is shown the fine Maurische combination, on 18° body. It consists of three characters only, all on square body, and is cast for one, two, or three-color work. There are two quite independent borders. The first character, numbered 1-2-3, is equally appropriate as running-piece and corner, and, when printed in a light tint, it forms a good ground-pattern, readily composed. The characters 4-5-6, 7-8-9, are respectively running-piece and corner. Both borders are exhibited above. The initial at the head of this column is one of a series for one and two colors called Ceres initials, made in three sizes. In the two smaller sizes

the initial is solid; in the largest size, as will be noted, an artistic effect is produced by softening off the lower part of the letter in a graduated tint. A combination, in great favor with German printers, is the Shield border, from which an endless variety of tablets may be composed, from a plain double-rule panel to the most ornate

shield. Out of twenty-eight characters we show eleven. One of the finest and most elaborate combinations of this firm is the Renaissance, in five sections, from 6° to 48°. The original series has a white design on solid ground, and the five series comprise 188 characters, the full font (which would only be required in a large office) weighing nearly a hundredweight. As if this exhaustive combination were not sufficient, the sorts are duplicated in a second series, the Light Renaissance, in which the solid background is omitted, and which many printers will prefer. We show specimens of both in this

column, and further examples, as well as headpiece - electrotyped from the design, elsewhere. There are vertical as well as horizontal characters; and effective sidepieces, as well as panelled borders, are readily composed. On another page, our readers will find several examples of the fine Rocco combination; also electro headpieces constructed from the same, some of which we annex. This design

contains in all eighty characters, some of them very large and beautiful. A later and very pretty series is the Broken Border,

containing four characters, and cast for one or two colors. The terminal piece is a very effective and useful feature of this design. A series of Silhouette Ornaments (known in America as "Poh" ornaments) contains a large variety both in size and

of colour to be achieved in chromolithographic work, among other features.¹¹⁵ An invention from Vienna mentioned towards the end of the same year would have been of interest to the jobbing printer taking poster work. It was described as a new affordable means of producing large poster types from matrices of gutta percha, for which any type could be used as the model, it was said that they were produced in a composition resembling stone, taking about two days to dry. Their virtues were further described:

When dry they are ready for the press; they are always cast type high and the material is very cheap. The types take any sort of ink readily, and are said to be as useful as wooden or metal ones.¹¹⁶

Also for the colour printer, Harding had noted a new departure for two-colour letterpress printing in red and black accomplished in the *New York World* of the 11th May, 1890. (See chapter 6.) Closer to home was an idea that had come at the end of the same year from George Tombs of Christchurch, to enable the efficient working of a two-color job. Commenting that he had not seen the idea elsewhere in any work on the subject, Tombs described the method with reference to the example of the printing of 10,000 demy quarto handbills, in red, white and blue in 10,000 impressions, on any ordinary printing machine:

Proceed in the usual manner, composing the job as for one color, and then dividing the matter into two pages, registering exactly with each other. Lock them up thus...[two diagrams are given: (1) shows a rectangle and (2) shows two concentric rectangles]. Cut your paper to demy folio 5,000 sheets, and print them in red; clean up the machine and form and change color to blue; transpose the pages (2) and (1), and print your blue form; then cut in half and you will have 5000 handbills red and blue, and 5000 blue and red, which, with the white paper will give you the desired result—10,000 bills red, white and blue. The plan is thoroughly practicable, as I have proved on various occasions by adopting it myself. I have shown the results to several smart printers, and not one of them could tell how to do it.¹¹⁷

That such advice was read was evident from the similar idea that was later received and published in *Typo* from the Napier printer, Mr. W. Timperley who wrote, implying that the idea was not entirely new:

Re Mr. Tomb's idea—this is more advanced: as it obviates the necessity for transposing the pages. Impose the form thus: [diagrams contained the word TYPO in two styles in each of two side-by side rectangles, (1) and (2), one of which was up-side-down.] By this scheme, when the first color has been worked off, you have merely to turn your paper round, and clean up for another color. We used this method regularly and successfully at home for two-color posters.¹¹⁸

R.C. Harding warned that many processes, even the newer photomechanical methods, still needed the touch of the artist for success. In commenting on a picture 'The Village Bean' in many colours and shades in the May 1891 issue of the *American Art Printer*, he said that the presswork reflected "great credit on the ingenious pressman of the establishment, Mr. William H. Ryan." Produced from two impressions from one block, the method, which was described in detail, Harding said "seemed impossible". He continued:

The process was as simple as it was ingenious, though in the hands of any one but an artist it must have been a failure...so deftly were the colors blended, and so completely did the second impression conceal the method...¹¹⁹

By 1893, when three colour 'process' relief work was beginning to appear, Harding discussed a new method that had been reported in the September/October *British Printer* with reference to a still life "in three workings" from Husnik and Häusler's photochromotype process that was shown. Describing it as "equal to ordinary work in from ten to fifteen printings," he said "[it] is, we feel, the color process of the future...when worked in register, in the pigments most nearly resembling the prismatic primaries, the effect is wonderfully pure."¹²⁰

In an environment in which technical change had become the norm, by 1893, R.C. Harding observed that a tendency among printers towards specialisation was becoming apparent, a trend that was not only beneficial for business, but also for the maintenance of standards:

Master printers used to advertise they could do 'every kind of printing'...I know of no-one who makes that boast now. Every sensible printer finds his advantage, not in getting together all the orders he can, but in getting only the work that he can do at a profit—work that he has facilities for and that he knows how to manage. The tendency of the trade is to specialties.¹²¹

In 1897 a telling piece by Harding in the last number of *Typo*, headed, 'Unrest', directed his view of both typographic and other printing trends to all printers, including colour printers, in the context of the general cultural scene. He said: "If we had to characterize in one word the most prominent feature of the closing years of the century, that word would be unrest...an unquiet spirit". He saw this as manifest throughout relationships, whether personal or in the international arena, and said that there appeared to be no rational basis for this: there was a love of change for changes sake, even if it proved disastrous, and the signs that this was so were to be seen in English literature and art. He said that, for example, he saw Beardsley as one of the first apostles of a style characterized as having "startling designs in broad flat masses of crude color, unlike anything in heaven or earth or sea....he has substituted a weird and unnatural form of decoration for the intelligible traditional fashion of illustration". He went on "For years Britain has led the way in elevating the art of the satiric draftsman – *Punch* : fifty years ago, simply a jester ; now the cartoons of Tenniel sometimes reach the sublime, and *Punch*'s caricatures are often the truest portraits."

Harding commented that the mechanical art of bookmaking had been affected, and, summarising the period after William Morris, said that such things as heavy-faced romans and the tendency to huddle up headings were appearing, as well as features that would confuse the reader, such as the omission of indentations, the setting of break-lines in the centre, and the abandonment or sparing use of leads. Other faults he saw were that headings, initials and heavy solid borders were being set close to matter, and running heads omitted

altogether or placed at the ends of lines. In short, he considered that through the use of "fine paper, the best of presswork, and wide, (sometimes extravagantly wide) margins...eccentric pages...find acceptance." However, he considered that type design had not been greatly affected at that time by eccentricities such as those seen twenty years previously, when, he said, the Jenson faces had exemplified "delirium in type design." On the subject of printing fashions, Harding predicted that twenty years hence, people would look back at the decade of the nineties with "mild contempt", such as had been "bestowed on the fearful circulars of 1880 adorned with Japanese ornaments in mauve and green". He said that the result would be that the "wild extravagance will pass away", and that the best printers would be responsible for "real progress". However, considering that such moves against convention would, in the long run lead to greater "freedom of design [such as had been] characteristic of the new movement," Harding said that the movement could be interpreted as a sign of a "healthy awakening", and that eventually "a lasting influence will have been brought to bear on the art of book-making...[but not until] the sifting influence of time has operated..."¹²²

Critical comment in *Typo* often included allusion to colour printing, as, for instance, Harding pointed out examples of superior colour work that the New Zealand printer might emulate, or conversely, examples of what he considered was best avoided. For instance, after stating that the last ten years had brought progress in ways to enliven printing work, he said of the first issues of the *American Model Printer* that "most of the startling effects [are] now out of date compared with the advanced work of recent years, the display is inartistic, and the color arrangements repellant."¹²³ On the other hand, Harding had previously drawn attention to an example that he considered to exemplify excellent colour printing: a portrait of the first *Bishop of Vienna* executed by the German firm of Knöfler, and published in the March/April edition of the *British Printer* in 1889. In this case both technical and aesthetic accomplishments were praised: Not only did Harding consider that in this case register was "faultless", but he declared also that he had not before seen "a piece of chromographic printing by lithography or any other process, to approach this for beauty and delicacy...the work possesses a fascination to us beyond anything of the kind we have ever seen."¹²⁴

A 20th Century New Zealand Colour Printer Looks Back: Local Challenges and High Standards

William Seeney: Biography and Training

Looking back on his work in colour lithography in the New Zealand printing industry from the perspective of the twentieth century, William Seeney has been able to comment on the challenges that faced colour printers in a changing technical environment as automation of colour printing processes progressed. Although he did not emigrate to New Zealand until

after the second World War, Mr. Seeney's early experience familiarised him with many features of the technical environment that were commonly in force in New Zealand towards the end of the period under study. The thrust towards automation for the achievement of increasingly controllable standardised practice in the interests of economy created an environment in which established procedure in the production arena was progressively superseded as new processes and equipment became not only available but affordable in the business environment of the printing firms. Such an environment provides the opportunity for assessment of both the kinds of problems that had existed, and the opportunities provided by new technology as it came to hand. Critical comment from a lithographer who worked in the trade over a period of almost fifty years elucidates some of the factors which had to be considered and overcome in the interests of achieving desired standards, and also highlights some elements particular to the production environment in this country that impacted on such achievement, as well as on the general maintenance of standards.

At an interview conducted for the purpose of this research project, William Seeney recently discussed his long life and work as a colour printer.¹²⁵ Born in 1910 in England, William Lewis Seeney began an apprenticeship in 1927 at a London firm, the Southern Printing Company in South London, where he worked during the day. At the same time he studied for three evenings a week at the London School of Printing and the Bolt Court School of Engraving, the latter because of his interest in the application of photography to printing. At the time, there was competition for places at both these institutions. After starting in the block-making section at Southern Printing, where he learned to operate the camera in connection with making blocks for newspaper illustration, William Seeney moved into the lithographic section where his work included making lithographic plates, and where he described the technical environment as being "pretty primitive then." For example, at the time the photographic plates were still being made by coating a plate with albumen and bichromate, and then putting it on the whirler (which was heated from beneath by gas) to both flatten it out and dry it so that it became light sensitive. The negative could then be made.

Although his lithographic training began over a decade after the period under study, the often inevitable time-lag between the pioneering of processes and their coming into use meant that many features in the operational environment were the same as those found in many printeries in earlier times. For instance William Seeney recounted that during his initial time as a printing apprentice negatives were still being prepared by the wet-plate method of dipping glass into collodion to give a light-sensitive coating for use with the

camera in process line-work and in conjunction with a screen for making half-tones: the old technology was still in use even although the dry-plate method was by then available. Bavarian lithographic stone was still in use for the transfer method of lithography, the prevailing process at that firm. In those pre-television times, recalled Mr. Seeney, poster production was at its height, especially for advertising purposes, and was still being executed in the manner used by Toulouse Lautrec at the end of the nineteenth century. For example, two colour poster printing consisted of first drawing an outline and taking a transfer to put on the clean stone as a key, after which the artist made up the colour separations using a pen and brush charged with grease and dye to fill in the areas of the image, with lines separating the different colours to be printed. Tones were rendered in the stipple style. William Seeney described the process as requiring great skill, and similar in nature to the creation of a piece of art.

After his apprenticeship, in the nineteen thirties William Seeney moved to a job with the firm of Harold Wesley and Co., where he rose to a position of responsibility in the machine room. At this firm the old flat-bed machines had by then been superseded by both British and German two-colour cylinder machines, and zinc plates had replaced the old lithographic stones. In this decade, as colour photography came in, he saw the poster artists become redundant and more rotary machines replacing the flatbeds as offset lithography more generally superseded the old methods of printing straight to paper. After serving in World War II, he returned to printing, finding that his expertise in two-colour printing was in demand as offset cylinder presses completely replaced flatbed machines. Those trained in the newer technology were considered "the crème-de-la-crème" and were well paid, while the flatbed operators could no longer get jobs. William Seeney recollected that in post-war times there was a general wish to brighten things up, and for printing this translated to a client demand climate in which "everyone wanted colour." After a time working again at Harold Wesley, he decided to emigrate, and in the fifties moved with his family to New Zealand.

In New Zealand: Colour Printing at Coulls Somerville and Wilkie

Looking back to the period when he first came to New Zealand, Mr. Seeney said that although he was not aware of it at the time, even by then people with his training were "very few and far between," but, having a family to support, initially he took a job as factory manager at the Empire Box Company in Wellington. Here he used his skills as a colour printer and his knowledge of plate-making to introduce the step-and-repeat machine for the colour printing required on boxes. The plate therefore has multiple frames: the

machine prints from one and then moves on a step for the next impression, and so on. However, when after two to three years he decided the time had come to move on, he found that job offers were numerous. Eventually he took a position in charge of the lithographic section at Coulls, Somerville and Wilkie in Dunedin where he stayed for the rest of his career. The around fifty staff in the lithographic department engaged in the plate-making and photolithographic processes comprised about a fifth of the staff at the firm in the nineteen fifties.

Because of his special skills in colour lithography, William Seeney has been able to reflect on several matters that bear on colour lithography as practised in New Zealand. He said that lithographic practice in New Zealand in the fifties was not much behind the English practice with which he was familiar. He saw the day to day life of the New Zealand lithographer as being not much different to the daily life he had previously experienced as an English lithographer using the transfer system, a process that had been used in both countries since the nineteenth century. Some of the technical problems that William Seeney said he faced in achieving high standard colour printing were not new, but were difficulties that earlier chromolithographers had also grappled with. The following are some of the factors discussed by Mr Seeney that had commonality with colour printing in New Zealand in the earlier period to 1914.

Technical Factors Affecting the Achievement of High Quality Colour Transfer Lithography

Inks

For the lithographic colour printer ink quality was of great importance as it affected the visual results, and for this reason was always of concern. For example, in two colour printing, the viscosity of the ink could affect results where the colour printed on top was too thick, causing the expression of the other colour to be compromised. Where such a property may not be a problem in one order of printing, it could become critical in another. For instance, in four-colour printing it was usual that the black impression was the last, but when black was used in printing with one other colour, could come first. Another problem was that some inks were less stable than others, for example, some would “burn out”, especially magenta, which, if left in the sun could take on a greenish look. Sometimes ink batches differed in colour, and some were of poor quality: William Seeney remembers some very poor yellows in particular that were “almost like sand”, so that they “sort of wore off the image.” He considered that gradually dyes, varnishes and lacquers all improved out of sight as the demand for coloured inks increased in the fifties after the war. In the early days, he said, there simply had not been the demand for coloured inks, so that the quantity

manufactured had not warranted the cost associated with a general improvement in ink standards. However, Mr Seeney pointed out that poor quality was also often related to the cost of the ink itself, and printers who used poor quality inks sometimes did so because they were more affordable.

Colour Control and Correction

In an establishment such as Coulls Somerville and Wilkie where, with the exception of much bookwork, the gamut of colour work was carried out, but where reproductive colour printing was a particularly important activity, quality control was essential. It was at Coulls Somerville and Wilkie that most of the printing was carried out for the reproduction of New Zealand art works for Caxtons of Christchurch. However, much jobbing work that required colour printing was taken as well, for instance, for the printing of food labels, boxes, record covers and cigarette packets. For such items high standards were also often demanded, especially if required for overseas export as in the case of Watties food labels. Quality control was in place to the extent that each sheet was inspected for colour quality as it came off the machine. Over the next two decades, William Seeney saw offset printing technology almost entirely replace straight-to-page lithographic machining, gum reversal photography techniques adopted, and already-coated aluminium plates come in, but in this environment of technical change, the constant was the requirement for high standards.

William Seeney noted that throughout his time as a colour printer, no matter how good the photographic filters, the lithographers, or, in the case of colour halftone printing, the dot etchers, the colour was never quite right without colour correction procedures, and this was a potential problem in an establishment where superior quality was a prime requirement. Particularly in colour control and correction work, he says, excellent colour vision is crucial. That Mr. Seeney possessed the essential colour sense was evidenced by the fact that the firm did not want him to lose him even after the time came for him to retire, and he was asked to stay on as colour adviser, a post that he accepted for a further five years, until 1975. He gave advice not only for reproductive colour work, but also to assist commercial artists in understanding the colour printing processes, so that they could then produce original work in a way that would make the subsequent colour printing much less costly. The importance of the latter is evidenced by the official reports produced in the nineteen sixties for the printing industry by the New Zealand Committee on Standards of Graphic Reproduction. In the first report, dealing with the subject 'Preparing Material for Reproduction' it was stated that the aim of the committee was to provide knowledge of the technical aspects of "correct preparation of the artwork," because

it is a fallacy that skilful work in the reproducing stages will correct a faulty job. The truth is that successful facsimile production depends on the use of suitable art techniques.¹²⁶

Mr Seeney observed that it was disastrous for a colour printer to have any degree of colour blindness. Very accurate colour vision was essential, but the problem was that the attribute was not always easy to find. He believes that he in fact did possess a special ability for colour discrimination, explaining that in his opinion, many people did not have the ability to see the range of differences in shades that he could distinguish, for instance, as yellow progressed from warm to cold. He explained that he sees colours as many gradations of shades of grey and that he had the ability to judge colour according to that fine gradation from white to black. He felt that this was one of the reasons that his skills had been in such demand. Mr Seeney considered that such ability had been even more important for the attainment of colour control in the days before three and four colour printing had superseded the older chromolithographic methods in which he was trained in pre-war times in England.

The chromolithographer working on the stone used many colour printings, if needed, to produce the colours required, and relied on his colour vision for the exacting colour judgment necessary to the process, Seeney recalled. The chromolithographer would first select his inks from those in the ink-room and mix the colours wanted for the job. Although the basic palette may have consisted of, for example, eight colours, including lights and darks, more colours could be introduced if desired, for instance to make the matches required for reproductive work. In this environment, one in which there were few time constraints, this work, which was reciprocal to that executed by an originating artist, was also akin to art, and in fact could require even more skill than was needed for original lithographic work in colours, particularly when the original had not been created with a reproductive process in mind. For colour correction to proofs, at the side of the machine there would be a swatch on the ink mixer to which reference was made as printing proceeded. Mr Seeney considers that the key to excellence lay in using the colour judgment to reproduce a shade with exactitude. In connection with this aspect of colour printing, a concern that some lithographic work was inducing a form of colour blindness (more like colour fatigue) had been published in *Typo* in 1890:

Color blindness is increasing among French chromo-lithographers. It is attributable to their being engaged in printing long numbers in the same colors—the primaries being the most injurious to vision.¹²⁷

In New Zealand, where gravure had not caught on as it had done especially in post-war England, lithography using the photographic processes for four colour printing were

however common in Dunedin by the time Mr Seeney began working there. The change, he said, meant that it was no longer necessary for the colour printer to mix the inks: "you get the yellow, cyan and magenta out of the tin and there it is." Mr Seeney commented that up until the nineteen seventies at Coulls Somerville and Wilkie, no automatic controls or calorimeters were in use, so that all colour correction had to be done by eye, but colour checking strips on the outside of the printing had always been in use. For use with four-colour printing processes, the ink makers provided printing sheets which were numbered according to increasingly darker shades. William Seeney felt that at Coulls Somerville and Wilkie the colour work was of a high quality, and that even although the staff were expert colourists, in view of the still heavy reliance on manual systems, he feels that "it was surprising how good we became."

In the days before gum reversal photographic techniques, for three and four colour halftone processes colour correction could not be done in the positive. The problem was that because the dot etcher was able to make adjustments only by the removal of a portion of a dot, an action that could not be reversed, such fine work required not only great skill but also a very high degree of colour discrimination. As well, if such colour halftones were to be printed by relief, because the block was rigid by its nature, if too much was taken off a resulting unevenness could be reflected in the possibility of dots missing from the printed page, a situation that would alter the appearance of the colour. To ensure colour printing efficiency, this necessitated the use of smooth surfaced coated art paper as a compensatory measure, so that standards would not be compromised in this regard.

Register

A problem common to colour printing down the ages was that of obtaining accurate register. Mr Seeney explained that good register had in his time still not been easy to achieve: "register was a nuisance: it was always our bugbear." For example, particularly with label printing, ellipses were a challenge, especially where several colours were in close proximity, in spite of the fact that "register marks" facilitated an automatic "fit" the sheet of paper would stretch across the grain. Mr Seeney considered that it was the introduction of rotary printing machines that later alleviated this problem. Compared with standards for register required at the Wellington Box Company, where he said the step machine never allowed completely accurate register, for reproductive work at Coulls Somerville and Wilkie, where superior printing standards were required, more care with this aspect was taken.

Machinery and Plate-making Techniques

In accord with the quality of colour printing required, the machines at the lithographic section at the Dunedin firm were better than those at the Wellington firm where the colour printing did not require such high standards. The plant at Coulls Somerville and Wilkie was equipped with two and four colour presses that were suitable to the transfer processes in use, but for quality colour printing pressmen needed particular expertise, for instance, much care was required in making appropriate adjustments to the cylinder pressures being applied. Plates were manufactured on the premises using photographic techniques for many years until the introduction of ready-coated aluminium plates "made life a lot easier," but even when such plates were in use, they were still processed in the same way until later gum reversal techniques and offset printing was introduced.

The New Zealand Production Environment

Market Size and Training

William Seeney found that in New Zealand, where letterpress printing was dominant, there were few people who had been as thoroughly trained as he had been even in the lithographic colour printing processes, a condition that had also been present in the study period. This lack of local expertise meant that there were few people who could do the work especially in any one city, so that unless lithographers were willing to go elsewhere, this was a factor that encouraged a firm to retain good staff and cut down the need for constant training. Once high standards were reached, such a situation facilitated their maintenance. In New Zealand, markets were small, especially for high quality colour printing and although run sizes gradually increased, by overseas standards they were usually relatively small. This led to the fact that most New Zealand colour printing firms tended to be general printers rather than specialists, so that general expertise was needed, and training had to be across the board, rather than honed to a specialisation. It had not been until the nineteen sixties that a degree of specialisation was introduced when jobs that could be accomplished on small colour presses, such as the printing of tobacco packets and record covers, were sent to a plant established at Palmerston North.

A Bias to UK

William Seeney considers that a bias towards Britain sometimes contributed to the loss of an opportunity to improve standards in New Zealand. He gave as an example the fact that New Zealand printers, who had to import machinery and equipment had the opportunity to take advantage of the better standards reached by German manufacturers after the war, as for instance their superior cameras were available by the sixties. He commented that he

considered he had made a mistake in buying a camera needed by the Dunedin firm from Britain, but later discarded it in favour of the German-made item.

Other Considerations for Effective Standards

Mr Seeney considered that technical changes gradually achieved a more automated production environment that was a far cry from the largely manual processes of plate-making and working on the stone that he had initially been trained in, and that changes incrementally made in the interests of standardisation, for instance of inks, had contributed to a greater control over repeatable colour printing standards, although he pointed out that the human element was still present and critical in all cost effective production. An essential part of this lay in the possession of the innate tool of excellent colour vision to achieve the work, but also in the development of efficient systems and in the consideration of how best to serve the client. Consequently, good management, which had to meld all together, also was important in ensuring that consistent standards were reached and maintained.

In his experience, William Seeney's opinion was that, owing to the inherent problems of reproductive colour printing, it was often extremely difficult for the colour printer to provide an exactitude of colour matching, and even more effort was required to reproduce some of nature's colours to the satisfaction of the client. In retrospect, he considered that it was surprising how accurate was the colour representation and reproduction achieved, but said that it had been the attention given to checking procedures and simply "being fussy" that had helped to achieve the best results. Although, he said, you could never produce, say, the exact colour of a daffodil, "you could get very near." In addition, for the optimisation of results, he considered also that a genuine interest in achieving excellent quality had been important. In his case, he considered that his fascination with the achievement of the best standards possible sprang from his belief that the difference between a well-printed article and another was that the well-printed item was capable of giving such pleasure in both the handling and the viewing. However, as he had stressed, without the tool of excellent colour vision, the essential colour printers' innate tool, such striving after high standards would have been in vain.

Human Colour Vision and Colour Printing: Recent Research

Although much progress has recently been made in the understanding of the mechanisms of vision, including colour vision, the phenomenon of colour is a complex subject not yet fully understood and one that is not wholly explainable by any one approach. The experimental psychologist Ian E. Gordon has said that "the neural structures underlying mental events may be interacting in ways of which we cannot conceive and which could never be

described using only the language of neurophysiology.”¹²⁸ However, within the area of vision research, Gordon has stated that “what has emerged from modern neurophysiological research is something of a consensus among leading workers about the basic nature of vision.”¹²⁹ Such scientific research has contributed to the understanding of the neural mechanisms that are involved in the physiology of human colour vision, and of its potential and its limits. Such knowledge can be usefully applied to an understanding of the place and role of the colour printer’s vision in the production environment, and reciprocally, printing industry research carried out in the area of colour printing must take such knowledge into account, as far as colour vision is an operative part of colour printing systems and processes. Such matching of research can assist the improvement of the automatic control of printing processes where needed, as well as the formulation of repeatable colour printing standards. To optimise printed results, the adjustable printing procedures must be made as far as possible concordant with the generally incontrovertible facts of normal human colour vision, since the recipient of the print product must also use the faculty of colour vision to interpret the colour printed page. It is fortunate that modern research into the neurophysiology of vision means that some of the important facts concerning the mechanism of colour vision are now proven:

The two most important facts about colour vision in humans (and some other species) are, first, that our colour vision is trichromatic and second, that we experience highly predictable contrast and fatigue effects.¹³⁰

It is a physical fact that the nature of the coloured page or surface being viewed causes the attenuation of light waves falling on it, thus specifying the wavelengths that reach the retina. To achieve the best visual results, the colour applied to the page, which acts as the stimulus to receptors in the human eye, must be applied in a manner that maximises the behaviour of the human perceptive ability for colour, that is, the reciprocal nature of the behaviour of colours used in colour printing and the physiology of colour vision must be taken into account. It is fortunate that much of the mechanism is now understood. For an outline of the mechanism of human colour vision, see Appendix 3.

Colour Vision Mechanisms and the Development of Standard Colour Printing Systems

Insight into the function of the human visual system is an aid to the setting up of appropriate colour printing systems, in cases in which the intention is to faithfully duplicate the colour of the real world. It can be shown in the laboratory that, for human vision, any colour can be matched through the combination of three appropriately chosen spectral stimuli. “Whether the stimulus mixture is of an additive or subtractive type, as long as the chromatic and achromatic activities evoked in the neural system by some combination of the three spectral variables are precisely those produced by, say, a single broadband stimulus, both the

mixture and the stimulus with the broadband distribution look identical.”¹³¹ Because, as has been seen, the principles governing the behaviour of colour pigments as they are mixed and matched are basic to colour printing processes, it is also vital that the colour printing procedures themselves are compatible with the known facts of the intrinsic behaviour of physiology of human colour vision.

Understanding the way human vision works also helps to explain why colour reproduction is not yet perfect, despite the enormous progress made in colour science especially over the last century. In 1948 Thomas Griffits stated: “I think it will be admitted that perfection has not yet been reached in inks, negatives, filters or plates, and that the results obtained are faulty and in the nature of a compromise.”¹³² In the area of reproductive colour it still remains impossible, by known printing methods, to exactly reproduce some colours that may be present in an original. This difficulty does not pertain to printing alone, but also exists for painters, as Griffits pointed out:

There is nothing more difficult in painting than to try to match with water, or oil colours, a middle strength colour in nature. The depth of the colour is simply amazing when compared with any printing medium. Compare a blade of grass or the petal of a flower against the painted attempt, and the comparison will show at once how strong a green the blade of grass appears; it would be very difficult to paint the shadows with anything like the depth of the natural shadows. A painting is mostly a compromise as the depth of the middle strength colour has to be painted in proportion to the attainable high-lights and shadows.¹³³

Because most modern colour printing depends on photography, some difficulties are also introduced due to the properties of colour film. For instance, “certain broadband distributions that look different to the average eye often come out looking identical in color film, [and conversely] the film does not discriminate some color differences that are readily apparent to the eye.”¹³⁴ In addition, three significant areas that influence printed colour quality have been said to be “the photograph itself, which calls for a photographer to be sensitive to color composition and contrast; color separation, which can establish and alter color density and tonings; and registration, which is the province of...presses and which will largely determine the sharpness of the pictures...” Further understanding may well refine knowledge in all relevant fields so that practical difficulties still remaining may find a rational solution.¹³⁵

Colour Constancy

Although the boundaries between colours are not defined in any exact sense, in general, a number of distinct hues such as red, green, purple or yellow can be discerned by people with normal colour vision. The hue of a pigment is defined as its similarity to a spectral radiation. Other terms that apply to the field of colour knowledge also need to be closely defined to enable the standardisation of processes, including printing processes that depend

upon that knowledge. To clearly specify a colour, the attributes of hue, depth and brightness/lightness must be determined. Depth depends upon concentration and brightness depends upon the total amount of light emitted from a colour. The latter is also influenced by the lightness of the surrounding area. When viewing colour, including colour in print media, the eye functions in variable conditions such as changing light intensities which potentially alter the appearance of that colour. However, these variations are ameliorated to a certain extent by the ability of the eye to adapt to a change in illumination from light to dark, by such means as the optimum employment of the differing abilities of the rods and cones, or by the ability of the iris to vary in diameter. Thus, to a degree, the eye controls the amount of light falling on the retina at a given time. These adaptive responses allow a certain amount of colour constancy to prevail, allowing distinctive colours to be recognisable in spite of some change in the light conditions. The ability of the brain to infer colour from the relationships of surrounding colours also aids colour constancy, but even so, colour distortion is eventually caused if the light change is considerable.¹³⁶

The Important Principle of Metamerism

In the area of colour reproduction, the exact matching of printed colour to the colour in the original can be of the utmost importance. Although there are three kinds of colour cones in the retina, for two colours to be perceived as a match, the only requirement with respect to cone sensitivity is that the total light stimulation coming from both objects must be equal. Two objects which are colour matched in this way are called metameters, the phenomenon of metamerism being defined as “the property of the eye and the brain to receive the same colour sensation from two objects with different spectral distributions.”¹³⁷ However, even though two objects may be metameters in certain given conditions, they may cease to be so, if, for example, the observer changes, or the illuminant changes from perhaps daylight to artificial light. The fact established by Maxwell is that in general all colours can be matched by a mixture of the primary coloured lights red, blue and green. Although the colour sensitive cones of the eye are stimulated selectively by red, blue or green light, in the biological system these sensitivities overlap somewhat. If this was not so, and instead, the red cones responded only to longwave light between specified wavelengths, the green cones to specified midwave light and the blue cones to the remaining shortwave light, then a “correct” colour reproduction could be made by a straight printed recombination of the colours according to the exact proportions indicated by the separation records. This would be because in this idealised system, the red light reflected from the reproduction would exclusively stimulate the red cones, the green light would stimulate only the green cones, and the blue reflected light only the blue cones. However, this is not the physiological case,

but rather the cone sensitivities overlap, making the situation more complicated because neither red, green or blue light can separately stimulate the retinal cones. Thus a blue-green light at 500 nanometers (nm) not only stimulates the blue and green cones, but also stimulates the red cones to some extent, that is, the colour is perceived as containing red which is not actually there. These unwanted stimulations are another reason that standardised colour printing systems have not been easy to achieve.¹³⁸

The implication for the colour printer is that in attempting to match a certain colour appearing in an original with the colour intended for printing the reproduction, many adjustments to ink proportions are often necessary to achieve a suitably close metameric match. However, more difficulty is presented for some colours than others, and those in the blue-green part of the spectrum are particularly problematic. For instance, it may be attempted to match a blue-green at 500 nm in an original, perceived by the eye as if it contained some red, by mixing blue and green standard inks. However, since both these colours may elicit a 'red' response on their own, the unwanted response is increased when the blue-green ink created by mixture is viewed, and thus to reproduce such a blue-green so that the colour appears exactly as it looks in the original is a problem. The unwanted stimulation serves to reduce the ratio of the shorter to the longer wave stimulation, so reducing the contrast effect and causing the perception of a less vivid colour in the match.¹³⁹

It can be seen that there is the need to adjust the ink mixture to negate this 'extra' red perception if the blue-green printing ink is to perceptually match the original blue-green colour. In spite of the generalisation that it is possible to match any colour from a mixture of three coloured lights, the actual situation is that "this is not immediately possible for spectral or near-spectral colours" unless one of the three primary matching lights is added to the colour to be matched, but not to the match. In this case, the spectral colour to be matched would also appear as de-saturated to a similar extent to the colour resulting from the action of mixing the two remaining primaries, therefore making a match possible. Thus by this means the extra red added to the original spectral blue-green is equalled by the total 'red' stimulus caused by just adding the blue and green. Another way to approach an explanation of the phenomenon is to think of this equalisation as achieving a negative amount of stimulus from one of the stimuli in the match. Given the ability for such colour adjustment to involve both the original and the match, then "the ability to match any colour by a mixture of three stimuli is achieved."¹⁴⁰

The reason that this solution cannot be used in reproductive colour printing is that an addition of colour to the original is of course not possible. "This requirement for negative stimuli is something of a problem in colour reproduction, since in general it means that any colour which requires a negative stimulus cannot be reproduced, and it also gives rise to errors in all other colours which can only be partly compensated for in general."¹⁴¹ Where mixtures of inks to achieve matching to a colour in an original are made using the standard ink sets, cyan magenta and yellow, a limiting factor is that the gamut of possibility for colour adjustment is to some extent circumscribed.

Thus it can be seen that to achieve a printed colour which as far as possible matches the colour of the original, it is necessary in most cases to make a metameric match which will often be a compromise. Most colour reproductions are made in this way, for, as already stated, it can still be held that from a mixture of the primary coloured lights all colours can be matched. From this premise, due to the fact that because of the physiology of colour vision metameric matches will appear to the eye to be almost the same, for practical purposes in printing, many standardised colour reproductive procedures have been developed. However, with the advent of modern colour film a great many different dyes have been introduced, and their differing properties can cause the complication of a slight overall colour shift to be inevitable. For example, the best compromise may mean that two metameric reds in an original may appear in reproduction more as two metameric oranges, but they will still match. In such a situation, the application of the highest standards will ensure the closest match possible, especially important when verisimilitude is desired, but such facts explain why, as far as colour verisimilitude is concerned, it has not always been possible to fulfill requirements absolutely. Even today, it is not yet clear how this problem can be addressed by altering the balance between colour separations, but is a matter still under research.¹⁴² For colour printing, it was not until after the period to 1914 that research carried out had resulted in such huge technical advances as the development of some automatic procedures for correcting colour balances during colour printing processes, including the computer control of inks, and the automation of other procedures, including scanning the original to determine colour content. All these improvements are in the end "concerned with manipulating the stimulus to be presented to the eye."¹⁴³

Because the colour separations for colour printing must accord with the human visual system, in order to create a printed reproduction in which the colours appear correct when compared to the original, the photomechanical system must analyse the colours of the original in the same way that the eye does. Bearing in mind that the film, unlike the eye,

does not have variable sensitivity, for example to variable illumination, appropriate filters have been developed for particular illumination conditions, and if used in conjunction with modern panchromatic film, give satisfactory colour results. Before deciding on the optimum set of filters, the effect of the light/filter/lens/film sensitivity combination must be considered. Research into improving filters is being done "in terms of their colour mixture capability" although Anthony Mortimer has pointed out that what constitutes an optimum reproduction has never been agreed.¹⁴⁴ Most photomechanical processes have been standardised for using artificial light conditions, because natural light is the most unpredictable and difficult to control, although it has been found that florescent light, while suitable for black and white work, is unsuitable for colour. Providing that the positive printing plates are processed so that they bear the correct colour relationships to the original as are recorded in the negative, a nearly true record of the colour proportions present in the original will appear in the printed result, given the application of standard colour correction procedures.

A factor that must also be taken into account is the intended size of the reproduction, relative to the original, because variables such as hue and saturation differences are to some extent dependent on size. As well, contrast effects will not register in the brain in the same way when an original scene and its reproduction are compared if there is a significant difference in size. This is due to the fact that different neural spatial interactions would operate in the two instances. Further, the surround against which a reproduction is viewed is likely to be very different from that of the original, especially if it is an outdoor scene, and this can alter colour appearance due to the different contrast effects.¹⁴⁵ All such variables must be taken into account for successful reproductive colour printing.

Often the purpose of the colour printing will determine the best compromises to be made, for in some cases an exact match may be expensive to achieve, but unnecessary in practice, for particular market purposes. In other cases, a correct colour match may be more critical, for example, for a mail order catalogue in colour. In this case, the goods received will be expected by the customer to match the colour that was chosen from the catalogue. In the period under study correct colour was important for instance, in commercial catalogues such as printed horticultural catalogues, and particularly for scientific publications. The range of colour printing processes that are now available allow the printer to choose the one most appropriate to the purpose, after consideration of the advantages and disadvantages of each. In the example given above, for instance, the printed colour in the catalogue must reflect the true colour of the goods, even when, as is envisaged, the catalogue is viewed in

artificial light. Ideally, the process that would best allow for these conditions would be the additive process of spectral colour reproduction, which requires “the spectral reflectance curves of the original and reproduced colours [to be] identical.”¹⁴⁶ This ideal cannot be absolutely achieved in subtractive printing, but the use of a fourth black impression to provide colour correction, as well as the use of extra coloured correction inks can provide a result that approaches this ideal. The one case in which spectral colour reproduction is possible in printing is that in which the original was itself produced from a mixture of exactly the same inks/dyes as are to be used in printing a reproduction.

Pointillism and the Colour Half-tone

The development of the halftone screen to enable the printing of the appearance of continuous gradations in tone values, as achieved in photographs, was a breakthrough in nineteenth century printing, especially for letterpress. The success of the halftone method rests on the fact that human vision is limited as to the fineness of detail that can be accurately seen, especially at a distance. Lines drawn at 0.2mm apart or closer are normally not distinguishable as being separate. “The finest pattern that can be resolved would be five line pairs (with one black line and one white line per pair) per millimetre.”¹⁴⁷ Because of this inability of the eye to resolve fine detail, printed illustrations made up of a fine dot patterns are perceived as being in continuous tone. This is because the eye integrates the white of the paper between a dot or line pattern into the total image which therefore appears as a continuous scale of grey between the black and white extremes. The tonal variations of the intermediate greys are determined by the relative quantities of black and white present in the image being viewed.

Thus it is now common in the preparation of image carriers to include photographing through a halftone screen to break the image into a dot pattern before the non-image areas are etched away. The fineness of the screen is important if the mosaic of dots making up the image is not to be apparent to the viewer, and this may be the result if the mosaic is too coarse. The dot pattern may also be discerned if a halftone image is viewed at closer than a normal reading distance. It can be demonstrated that the distance at which two dots or lines can be resolved by the eye is reached quite abruptly. For example, if a newspaper photograph is gradually moved away from the eye, the dot pattern will suddenly seem to disappear. If a rotation through 45 degrees is then made, the pattern reappears. This is because it is probable that “the eye and brain system codes vertical and horizontal information preferentially to diagonal information.”¹⁴⁸ The usual arrangement of the screen pattern at 45 degrees for black and white printing takes advantage of this fact that human

vision possesses poorer fine detail resolution for lines arranged in a grid at 45 degrees than at 90 degrees.

In halftone colour printing, where a screen is used for each colour separation, the final appearance of colour on the page is due in part to subtractive overprinting, so that mixtures of the three inks occur where they overlap. However, there is also a small element of colour mixing akin to the pointillist technique that has often been used by painters.¹⁴⁹ That the construction of a printed image as a mosaic of coloured dots is a successful method of printing in colours visually is because of the fact that the three kinds of retinal cones also make up a mosaic pattern. If the red, blue and green wavelength components of light that are reflected on to the retina from an object constitute a mosaic that is finer than the retinal cone mosaic, then the three colours will effectively be mixed in an additive fashion by the eye itself. This is because of the 'patch effect' (described in appendix 3), and can be verified by viewing red, green and blue squares in a fine mesh pattern at a distance: the appearance is of a single colour, the exact colour depending on the proportions of the three coloured lights reaching the eye.¹⁵⁰ Thus the juxtaposition of dots of different colours created by the halftone method causes the eye to mix them to form the impression of other colours. This effect has the advantage that there is not an accrual of the subtraction of the light from the paper/canvas, and so the colours appear more saturated than if they were overprinted. A tip given by Griffiths to letterpress printers using colour halftones was intended to prevent the problem of too much subtraction of light from the paper. His advice was to reduce the size of the dots to a minimum in more places "to allow strong or light tints of a colour to appear as if they were on plain paper in one colour only on certain parts of the subject reproduced."¹⁵¹

Although much progress has been recently made in understanding the mechanisms of human colour vision, there is still much that remains to be explained, two things being: how does a single cone cell decide which pigment to express, and how are colour-specific bipolar and ganglion cell channels formed?¹⁵² Further research in the field of human colour vision may well further explain how the practitioners of the art of printing in colours have endeavoured to maximally cater to our powers of seeing colours. Printers gradually worked out for themselves colour principles that accorded with observed phenomena of colour vision, and many demonstrated in their printed results considerable prowess in applying their own colour perception skills. That there are some individuals unusually gifted in their colour vision seems apparent, and among the printers so gifted were those with the ability to accurately analyse colour content of an image before the advent of modern colour

separation techniques. As well as grappling with the variables involved in human colour vision, colour printers have had to contend at the same time with complex processes and all the variables of printing materials that potentially stood in the way of their success, before the availability, for example, of standardised coloured inks. The latter caused many a visual complication, as the behaviour of the different inks could cause vastly different results. However, even although greater automation of quality control has been gained, the tool of human colour vision is still essential to the attainment of high standard colour printing as it yet remains the superior tool in work requiring fine colour corrections to be made.

The study of the art and science of colour is a truly cross-disciplinary one, and as research adds knowledge in one field, it also potentially feeds another. The art of printing in colours has been built over the centuries on the many facets of colour knowledge drawn from a variety of fields of investigation including physics, chemistry, physiology, and painting, as well as printing itself. Incremental understanding of all these facets has gradually contributed to the highly technical processes of modern colour printing, which at the same time takes advantage of the wonderful human ability of colour vision.

Response to Questions 8-10

The Role of Standards in Colour Printing: Summary

In chapter twelve, it has been seen that the development of standards in relation to colour printing facilitates several things. Firstly, suitability of style and colour standard assists effective print communication. Secondly, an ability for reliable physical uniformity across a run of print products enables predictable production costs to underpin rational pricing structure in the market, and to allow planning of production according to market structure and client expectation. Thirdly, a measurable quality level can provide a benchmark against which improvement can be demonstrated, and aided by the human impulse to strive towards betterment, can act as an incentive for further improvement; especially important where an ongoing quest for enhancement is necessary. As has been seen, the continuous quest for colour printing improvement was subject to the development of reliable technology suited to the fulfilment of a variety of purposes, and this took time.

Written Advice for New Zealand Printers Concerning Excellence

Many nineteenth century printers and other writers not only explained processes, but also made headway in laying down principles and giving advice to colour printers that facilitated cost effective business and provided guidelines that would enable a printer to more reliably produce colour to a given standard as required in relation to various market sectors and fashions. Such written advice constituted useful sources for isolated printers, and

supplemented information gained through other means such as the apprenticeship system, exhibitions, and contacts between tradespeople and suppliers. Many manuals and texts written for the trade on colour printing were published in English and others were translated into English. Many such works were available to British printers and were recommended to their New Zealand counterparts. Such titles supplemented advice obtained from personal contacts such as travelling tradesmen, commercial travellers and personal travel. Among prominent titles that had appeared in the early nineteenth century and that were of direct relevance for colour printers were Alois Senefelder's treatise, *A Complete Course of Lithography*, published in English in 1819, William Savage's *Practical Hints on Decorative Printing*, completed in 1823, and his *Preparations in Printing Ink in Various Colours* of 1832, as well as M.E. Chevreul's important 1839 work *The Principles of Harmony and Contrast of Colors and Their Applications to the Arts*. Later in the century, other prominent titles included John Southwards 1882 *Practical Printing: A Handbook of Typography*, and, of particular relevance to the colour printer, W.D. Richmond's treatise *Colour and Colour Printing as Applied to Lithography* of 1885. Joseph Pennel's 1896 work, *The Illustration of Books: A Manual*, addressed matters raised by the changing colour printing environment, especially in the context of the photomechanical revolution. Other works were appearing in languages other than English and many valuable general works and manuals contained advice that was equally applicable to colour or black and white work.

It has been seen that in addition many topical matters were aired in the trade journals and that many practical examples of colour printing were published in these. By the last two decades of the nineteenth century, trade journals were becoming more numerous and were increasing in range as more specialist titles appeared, mostly from the northern hemisphere centres of printing in Europe, Britain and America. Some of the well-known and long-running British titles that were also available to New Zealand colour printers began around this time. The *British Printer* began in 1888, and the *Penrose Annual: Review of the Graphic Arts* was launched in 1895 as the *Process Work Year Book*. Also available from 1895, *Penrose & Co.'s Catalogue* contained much information on equipment, including requisites essential to quality colour work in the photomechanical era. R.C. Harding's *Typo*, which was readily available locally, was especially important for colonial printers as Harding, being a printer himself, understood the particularities of the colonial environment. Containing a wealth of advice and printed example, including his own acclaimed colour printed title-pages, *Typo* was also read overseas, although there was a question as to how ready some local printers were to heed such advice. However, Harding was a front-runner in

his field, and his advice had been appreciated by the discerning. Over the ten year period in which *Typo* was published from New Zealand, Harding had provided a vehicle that gave colonial printers the opportunity to compare their work, including colour work, with that of their overseas contemporaries, and that gave the author the means to provide insightful education in art printing matters. Such advice for excellence in design and use of colour was appropriate to both the colonial and the overseas printer. Within its pages, Harding frequently mentioned publications that he judged would assist the tradesman in raising printing standards, especially books and trade journals from America, the continent and Britain. As discussed in chapter 7, much educative reading matter had also often been formally advertised in *Typo*.

Typo had acted as a medium to coach colonial tastes and to communicate concepts concerning levels of attainment necessary to the recognition and later adoption of more enduring standards, and was supplemental to the training and knowledge provided particularly by trade apprenticeships and art institutions. From the evidence of *Typo*'s pages, Harding's objective criticism and assessment of many matters that were relevant to both the letterpress and the lithographic colour printer were seen to cover such important topics as the exposition of the principles of design as they applied to colour printing, decorative letterpress work, as well as information concerning coloured inks. Many topics were raised within regular columns, Harding's prominent series 'Design in Typography' being a particularly important vehicle. The column 'Trade Wrinkles', often contained information in the form of hints and solutions to problems. Emphasis was given to the fact, of especial importance to the colonial colour printer, that attention to matters of design and layout did not need to add to cost. Advice was often linked to the practical colour jobs likely to be undertaken by the New Zealand printer, with articles on colour printing mainly from overseas experts, but including some from the local Ernest Wright, an expert colour compositor at the firm of Lyon & Blair in Wellington.

The Column, 'Recent Specimens' yielded much guidance for the colour printer on the subject of sundry items of equipment that contributed to the attainment of excellence in colour work, including advice on the essential types, ornaments, and coloured inks. Opening windows on opportunities for colour printers to improve their standards with regard to plant and equipment, Harding considered global sources and guided New Zealand printers towards taking advantage of the best available, giving reasons for his specific advice. In *Typo*, printed examples sent by colour printers, including overseas and local, were educatively reviewed, discussed, and sometimes published. Points were illustrated by

allusion to both the meritorious and the deplorable, the latter often intended to forestall disaster, while assessments were given as objective overviews of general standards. Much space was devoted to reporting on the state of the art in the sister colony, Australia, as well as in the northern hemisphere. Information concerning typefaces, borders, combinations and vignettes suited to the typographic colour printing vogue of the times, especially those from the German typefoundries found a prominent place. For colonial printers such a journal acted as an information bridge to other printing centres, but, in addition was not only communicating matters concerning colonial printing back across the seas, but was making a valuable contribution to the cause of raising printing standards, not least for colour work, everywhere.

Colour Printing Standards in Britain and New Zealand

For colour printers of the period, the achievement of uniform quality was a difficult matter: colour quality control did not come of age until the twentieth century. As discussed in section III, although strides had been made over the nineteenth century in such matters as improvement of processes, machinery and equipment, including, importantly, coloured inks, much still remained to be done in this field at the end of the period under study. The thrust of the photomechanical towards automation had applied to both British and New Zealand colour printing, but even into the second half of the twentieth century, and to some extent still today, reliance on the innate abilities of tradespeople with excellent colour-vision was necessary, particularly to the achievement of accurate colour reproduction.

As seen in this chapter, alongside progressive technical improvements, ongoing education of printers was considered to be a factor of major benefit to colour printing standards in both hemispheres. But the achievement of high quality colour work with regard to many of the factors discussed was generally more difficult for Antipodean printers by dint of their remote situation, and the less sophisticated general printing environment within the early phases of colonial establishment. In a situation where the concentration of colour printers such as to be found in London did not exist, the already tiny population was spread between several main centres where there was a much smaller overall volume of printing accomplished and a lesser spread of colour printing styles and processes being commercially pursued. Communications were more difficult and less comparison of printed results was possible at the local level. Many of the British and other European immigrants who came to New Zealand did so to escape the competitive conditions present for almost all facets of life: they chose the insularity of New Zealand instead. In these circumstances, a local comfortable mediocrity was able to exist for items that were produced mainly for the

local market where competition was less, and where educative training was not as advanced. Later, the unions played a part in bringing together geographically disparate tradesmen. But in the colonial situation, formally published information was important to the improvement of standards, and it was particularly for this purpose that R.C. Harding had published *Typo*.

Objective assessment regarding comparative standards in Britain and New Zealand were sometimes expressed, for instance, in the trade journals, not least by the well regarded critic Harding. For example, in support of the general need for education on matters of design which he was addressing through the series, 'Design in Typography', Harding had commented in March 1888 that ninety-five percent of the lithographic work executed in New Zealand showed printers to be neglectful or ignorant of the design principles necessary to success. In 1891 he had said that by then British printers were showing themselves capable of quality art printing of a distinctive kind, but that there was much room for improvement. In 1892, he had unfavourably criticised general colonial standards in the same area, although often also pointing to examples of excellence by then coming from some local printers. General improvement did not happen overnight, but rather needed sustained educative effort, one which Harding had continued to make throughout the decade of *Typo*'s publication.

As the photomechanical era progressed and the technical environment for graphics printing became more complex, standards were in a state of flux in Britain also. By the mid-nineties, British authors were pointing out that with regard to the newer process work British standards greatly varied, and others were focussing on the necessity for greater quality control in such areas as ink, paper, and machinery, before high class process colour work could be expected to be accomplished: it was clear that appropriate standards in the technical background underpinned the attainment of high standards in the production environment. Standard inks, particularly important for the colour printer, were first becoming available in 1895, and this was to be a step towards greater reliability in this area in both Britain and colonial New Zealand which imported them.

It was recognised that the possession of excellent tools had to be matched by the human ability to use them to best advantage for excellent production to result, but that in an experimental environment, such as had prevailed over the period for colour printing in any country, costly errors and uneven standards had been necessarily involved in the process. However, by 1914, British printers had achieved standards reliable enough to allow

photomechanical colour printing in the three main styles of printing—relief, planographic and intaglio—to join other processes that, when suitably deployed to serve the varying sectors that made up the wide market demand for colour, were found commercially profitable.

In New Zealand, where the strong cultural allegiance to Britain was a factor that affected judgment concerning the acceptability of standards, this was also true to a limited extent: within the more restricted environment of relief and planographic colour printing. Here, colour had been often associated with jobbing printing, being less frequently applied to the production of the more costly genre such as maps and art-prints and only occasionally to books. At around the time that colonial colour printing was becoming more widespread in the late eighteen eighties, R.C. Harding attributed the lead that Britain demonstrated with regard to colour design work to an improvement in formal training in the preceding decade and had pointed to British examples to make the point that in general he considered Britain to be far ahead of New Zealand. In the early nineties, a firm held up to New Zealand colour printers by Harding as executing the best colour work in England of the type most often within the scope of local firms had been Raphael Tuck. On the other hand, the generally low standards of book production present in Britain by the First World War was attributed to the concentration on cheaper colour production for the mass market, although there were signs of improvement due especially to continuing experimentation, often elsewhere, to strike acceptable balances between cost and quality. Automation of colour systems was part of this, for example the development of the science of densitometry.

In this chapter, the insights given by the chromolithographer William Seeney, who had practised colour printing in both countries in a later period, but who had used systems that had been in common use in the period under study, particularly transfer chromolithography, have elucidated some of the factors affecting the attainment of high standards of colour that were common to printers working both in Britain and New Zealand. Such factors included the quality of coloured inks available, as well as how they were handled; the age-old problem of obtaining exact register when overprinting; the importance of plate-making and press procedures; and the impact of such considerations as an orientation to the wishes of the client, and appropriate management.

Problems bearing on the production of quality colour in the printing environment that William Seeney experienced in training and working as a colour printer, first in England and then in New Zealand, allowed the discernment of patterns that were repeated in both

geographical and historical ways. For instance, it could be seen that the heavy investment in plant was one factor that had slowed down uptake of new technology in both Britain and New Zealand so that the new and the old co-existed for a time, a situation that had a tendency to be repeated in successive historical periods. Mr Seeney showed how the New Zealand cultural bias towards Britain had sometimes been a factor that contributed to the loss of a wider vision that in turn cut down opportunities for improved standards, while the generally shorter printing runs warranted in New Zealand had prevented the advantage that had been more available in Britain for the colour printer to specialise, and to hone skills accordingly, conditions that also pertained to the earlier era. Through his own experience of a long career working as a colour printer William Seeney explained the human element that had been critical to cost effective colour printing of a good standard, whether in Britain or New Zealand, laying emphasis on the fact that, besides a genuine interest in colour itself and the willingness to take pains, it had been the possession of excellent colour vision that had been a prime requirement for the attainment of high quality colour printing, particularly for colour correction procedures and the older art methods of chromolithography which required great finesse in the area of colour discrimination. Many of the factors mentioned by William Seeney corroborated matters discussed in the trade journals of the period in relation to the development of reliable colour printing systems.

Colour Vision and Standards

The Part Played by Colour Vision in Colour Printing Production

As seen in this study, colour printing practice was increasingly adapted to the changing nineteenth century and early twentieth century technical and industrial environment. However, with regard to the attainment of given standards, the mechanism of human colour vision, necessary to both the production and the reception of any colour print product, cannot be changed in the individual, although its quality may vary between individuals. An understanding of this factor has been important to colour printing standards in allowing possible and appropriate adjustment to production systems to underpin the ability to plan and execute production according to the quality required by market demand.

Excellence of colour discrimination was an important asset within the colour printing system as it enhanced the ability of the appropriately educated colour printer to attain given standards, and has in this way been a factor governing achievable standards of production. Through recent physiological research (outlined in appendix 3) it has now been possible to explain how the innate tool of colour vision was related to the colour printer's work, especially in the days of manual systems, such as to the work of the chromolithographer in

the pre-photomechanical environment who made all colour judgments by eye. On the other hand, from the viewpoint of the marketplace, the human attribute of colour vision has also been an active determinant in as far as the taste for colour has been a market driver, and in this way has always been a common factor in the reciprocal relationship between production and reception of colour print products.

Colour Printing Standards and the Mechanism of Colour Vision

The physical facts of colour vision, and their part in this reciprocal relationship have been relevant to the development of standards for automated colour printing systems as the constant in an otherwise increasingly alterable automated system, and has been taken into account in deciding how production systems may be appropriately adjusted to allow the achievement of a given standard of colour printing. Within such systems, a correct understanding of the mechanism of colour vision has facilitated logical problem solving, and has pointed the way to achieving a best matching of an alterable printing system to the fixed physiological system.

The understanding of the mechanism of colour vision also explains why some problems remained recalcitrant, for instance, illuminating the necessity for the development of the modern strategy of metameric matching to allow improved standards of colour reproduction. Such an understanding is able to provide a sound basis for a judgment concerning whether compromise is justified according to cost/benefit where colour matching is not crucial. It is also necessary to retrospectively appreciate the degree to which the properties of colour vision were successfully exploited in various colour printing systems where the faithful reproduction of colour images was vital. For example, it allows an understanding of why the development of colour half-tone technology towards a four colour system was optimum. Understanding of the difference between the unalterable facts of colour vision as opposed to other variable factors allows discrimination between which abilities necessary to the attainment of given standards are innate, and which are able to be acquired by appropriate training. This was especially important to the matching of standards relating to process and practice with the degree of colour quality control required for a given colour printing run. An understanding of the close relationship that has existed between colour vision as the innate tool that was essential to the employment of the colour printer's art as it was used to satisfy the marketplace desire for colour, links with the Book Cycle Model, in which, in the life of the colour printed product, the 'Production' phase precedes that of 'Reception'. Here it can be observed that between these phases many reciprocal relationships are also at work.

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- ² William Mills Ivins, *Prints and Visual Communication* (Cambridge, Mass.: M.I.T. Press, 1969), 53.
- ³ Augustine Hope and Margaret Walch, introduction by Michel Pastoureau, *The Color Compendium*, (New York: Van Nostrand Reinhold, c1990), 87.
- ⁴ *Ibid.*, 76.
- ⁵ *Ibid.*, 87.
- ⁶ W.D. Richmond, *Colour and Colour Printing as Applied to Lithography: Containing an Introduction to the Study of Colour, An Account of the General and Special Qualities of Pigments Employed, their Manufacture into Printing Inks, and the Principles Involved in their Application* (London: Wyman, 1885), 96.
- ⁷ Walter L. Buller, *Manual of the Birds of New Zealand* (Wellington: Govt. Printer, 1882), introduction, viii-ix. For a recent discussion concerning language and colour, see Mark Johnston, 'How to Speak of the Colors', chap. 9 in Alexander Byrne and David Hilbert, eds., *Readings on Color* (Cambridge, Mass.: MIT Press, c1997), 1, 137-176.
- ⁸ John Southward, *Practical Printing: A Handbook to the Art of Typography* (New York: Garland Pub., 1882.)
- ⁹ D.F. McKenzie, 'Robert Coupland Harding on Design in Typography', in *An Index of Civilisation: Studies of Printing and Publishing History in Honour of Keith Maslen*, ed. R. Harvey. W. Kirsop & B.J. McMullin (Clayton, Vic.: Centre for Bibliographical and Textual Studies, Monash University, 1993), 203.
- ¹⁰ Peter C. Marzio, *The Democratic Art: Pictures for a 19th-Century America: Chromolithography 1840-1900* (Boston: D.R. Godine, 1979), 12.
- ¹¹ Joseph Pennell, *The Illustration of Books: A Manual for the Use of Students: Notes for a Course of Lectures at the Slade School, University College* (London: Fisher Unwin, 1896.)
- ¹² 'Robert Coupland Harding on Design in Typography', 188.
- ¹³ *Typo*, 5 (April 1891): 53.
- ¹⁴ *Typo*, 5 (April 1891): 55.
- ¹⁵ *Typo*, 5 (April 1891): 53.
- ¹⁶ *Typo*, 1 (April 1887): 35.
- ¹⁷ *Typo*, 1 (November 1887): 88 (92).
- ¹⁸ McKenzie, 'Robert Coupland Harding on Design in Typography', 192.
- ¹⁹ *The British Printer*, no.9 (1889): 13.
- ²⁰ *The British Printer*, no.10 (1889): 10.
- ²¹ *Typo*, 2 (June 1888): 45.
- ²² Kathleen Coleridge, 'Booktrade Advertisements in Wellington Newspapers 1840-1859', in *BSANZ Bulletin*, 18 no.4 (1994), 207.
- ²³ *Typo*, 3 (March 1889): opp. 21, verso.
- ²⁴ *Typo*, 5 (August 1891): 118.
- ²⁵ *Typo*, 3 (March 1889): opp. 21.
- ²⁶ *Typo*, 1 (November 1887): 88 (92).
- ²⁷ *Typo*, 2 (March 1888): 18.
- ²⁸ *Typo*, 6 (January 1892): 8.
- ²⁹ *Typo*, 2 (June 1888): 45.
- ³⁰ *Typo*, 5 (November 1891): 154.
- ³¹ *Typo*, 5 (1891): 118.
- ³² *Typo*, 6 (1892): 5.
- ³³ *Typo*, 1 (January 1887): 1.
- ³⁴ *Typo*, 8 (January 1894): 6.
- ³⁵ *Typo*, 5 (1891): 149.
- ³⁶ *Typo*, 1 (January 1887): 4.
- ³⁷ *Typo*, 1 (March 1887): 15.
- ³⁸ *Ibid.*
- ³⁹ *Ibid.*
- ⁴⁰ *Typo*, 1 (March 1887): 16.
- ⁴¹ *Typo*, 1 (April 1887): 23.
- ⁴² *Typo*, 2 (March 1888): 23.
- ⁴³ *Typo*, 1 (May 1887): 31.
- ⁴⁴ *Typo*, 2 (February 1888): 9.
- ⁴⁵ *Typo*, 3 (October 1889): 110.
- ⁴⁶ *Typo*, 1 (July 1887): 54.

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- ⁴⁷ *Typo*, 4 (February 1890): 18.
⁴⁸ *Typo*, 5 (September 1891): 131.
⁴⁹ *Typo*, 2 (September 1888): 73.
⁵⁰ McKenzie, 'Robert Coupland Harding on Design in Typography', end-note 8, 204.
(For example, *Typo*, 2 (May 1888).)
⁵¹ *Typo* 3 (May 1889): 56.
⁵² *Typo*, 1 (February 1887): 8.
⁵³ *Typo*, 2 (October 1888): 85.
⁵⁴ *Typo*, 2 (December 1888): 113.
⁵⁵ McKenzie, 'Robert Coupland Harding on Design in Typography', 202.
⁵⁶ *Typo*, 1 (October 1887): 79.
⁵⁷ *Ibid.*
⁵⁸ *Ibid.*
⁵⁹ *Typo*, 5 (December 1891): 159.
⁶⁰ *Typo*, 1 (November 1887): 82.
⁶¹ *Typo*, 2 (October 1888): 93.
⁶² *Typo*, 4 (January 1890): 10.
⁶³ *Typo*, 4 (December 1890): 151.
⁶⁴ *Typo*, 5 (January 1891): 11.
⁶⁵ *Typo*, 4 (November 1890): 135.
⁶⁶ *Typo*, 4 (December 1890): 151.
⁶⁷ *Typo*, 5 (January 1891): 11.
⁶⁸ *Typo*, 5 (February 1891): 27.
⁶⁹ *Ibid.*
⁷⁰ *Typo*, 6 (September 1892): 71.
⁷¹ *Typo*, 5 (May 1891): 81.
⁷² *Typo*, 5 (November 1891): 145.
⁷³ *Typo*, 2 (June 1888): 42.
⁷⁴ *Typo*, 4 (December 1890): 151.
⁷⁵ *Typo*, 4 (May 1890): 59.
⁷⁶ *Typo*, 3 (November 1889): 135.
⁷⁷ *Typo*, 6 (January 1892): 8.
⁷⁸ *Typo*, 6 (December 1892): 93.
⁷⁹ *Typo*, 6 (August 1892): 63.
⁸⁰ *Typo*, 2 (June 1888): 51.
⁸¹ *Typo*, 4 (June 1890): 61.
⁸² *Typo*, 5 (December 1891): 157.
⁸³ *Typo*, 2 (February 1888): 15.
⁸⁴ *Typo*, 4 (June 1890): 71.
⁸⁵ *Typo*, 5 (February 1891): 18.
⁸⁶ *Typo*, 5 (April 1891): 49.
⁸⁷ *Typo*, 5 (June 1891): 87.
⁸⁸ *Typo*, 5 (October 1891): 135.
⁸⁹ *Typo*, 2 (March 1888): 17.
⁹⁰ *Typo*, 2 (March 1888): 17.
⁹¹ *Typo*, 3 (February 1889): 16.
⁹² *Typo*, 3 (May 1889): 47.
⁹³ *Typo*, 6 (November 1892): 88.
⁹⁴ *Ibid.*
⁹⁵ *Typo*, 1 (February 1887): 12.
⁹⁶ *Typo*, 5 (November 1891): 141.
⁹⁷ *Typo*, 5 (November 1891): 145.
⁹⁸ *Typo*, 4 (May 1890): 59.
⁹⁹ *Typo*, 5 (June 1891): 103.
¹⁰⁰ *Typo*, 6 (January 1892): 8.
¹⁰¹ *Typo*, 1 (December 1887): 89.
¹⁰² *Typo*, 1 (December 1887): 91.
¹⁰³ *Typo*, 2 (May 1888): 34.
¹⁰⁴ *Typo*, 3 (October 1889): 115.

- ¹⁰⁵ *Typo*, 2 (October 1888): 103.
- ¹⁰⁶ *Typo*, 4 (April 1890): 35.
- ¹⁰⁷ *Typo*, 7 (October 1893): 77.
- ¹⁰⁸ *Typo*, 11 (January/February 1897): 2.
- ¹⁰⁹ *Typo*, 11 (January/February 1897): 7.
- ¹¹⁰ *Typo*, 11 (January/February 1897): 2.
- ¹¹¹ *Typo*, 11 (January/February 1897): 1.
- ¹¹² *Typo*, 11 (January/February 1897): 2.
- ¹¹³ *Typo*, 11 (January/February 1897): 7.
- ¹¹⁴ *Typo*, 2 (April 1888): 30.
- ¹¹⁵ *Typo*, 3 (April 1889): 35.
- ¹¹⁶ *Typo*, 3 (November 1889): 127.
- ¹¹⁷ *Typo*, 4 (December 1890): 142.
- ¹¹⁸ *Typo*, 5 (February 1891): 22.
- ¹¹⁹ *Typo*, 5 (September 1891): 131.
- ¹²⁰ *Typo*, 8 (January 1894): 7.
- ¹²¹ *Typo*, 7 (January 1893): 8.
- ¹²² *Typo*, 11 (January/February 1897): 3.
- ¹²³ *Typo*, 4 (May 1890): 59.
- ¹²⁴ *Typo*, 3 (1889): 99.
- ¹²⁵ Mr. William Lewis Seeney, Interview, 26th February, 1999. (Taped and used with permission.)
- ¹²⁶ A.J. O'Dea, comp. and ill., 'Preparing Material for Reproduction', in R.H. Colson, comp., *Standards of Graphic Reproduction Booklet*, (New Zealand: The Committee on Standards of Graphic Reproduction, 1962-1966), [report no1.] (1962), 1.
- ¹²⁷ *Typo*, 4 (August 1890): 92.
- ¹²⁸ Ian E. Gordon, *Theories of Visual Perception*, 2nd ed. (Chichester: J.Wiley, c1997), 112.
- ¹²⁹ *Ibid.*, 152.
- ¹³⁰ *Ibid.*, 118.
- ¹³¹ Leo M. Hurvich, *Color Vision* (Sunderland, Mass.: Sinauer Associates, c1981), 300.
- ¹³² Thomas E. Griffiths, *Colour Printing: A Practical Demonstration of Colour Printing by Letterpress, Photo-offset, Lithography and Drawn Lithography, With Illustrations Demonstrating Alternative Methods of Production and Including a Comprehensive Colour Chart* (London: Faber and Faber, [1948]), 19.
- ¹³³ *Ibid.*, 20.
- ¹³⁴ Hurvich, *Color Vision*, 303.
- ¹³⁵ Stephen Fox, 'Setting the Color Standards', in *The Insider*, June/July 1991: 7.
- ¹³⁶ Anthony Mortimer, *Colour Reproduction in the Printing Industry*, (Surrey: Pira International, 1991), 25-26.
- ¹³⁷ *Ibid.*, 26.
- ¹³⁸ *Ibid.*, 29, fig.2.3, sensitivity of receptors.
- ¹³⁹ R.W.G. Hunt, *The Reproduction of Colour in Photography, Printing & Television* (England: Fountain Press, 1987), 16.
- ¹⁴⁰ Mortimer, *Colour Reproduction in the Printing Industry*, 28.
- ¹⁴¹ *Ibid.*, 29.
- ¹⁴² *Ibid.*, 81-82.
- ¹⁴³ Hurvich, *Color Vision*, 306.
- ¹⁴⁴ Mortimer, *Colour Reproduction in the Printing Industry*, 82.
- ¹⁴⁵ Hurvich, *Color Vision*, 304.
- ¹⁴⁶ Hunt, *The Reproduction of Colour in Photography, Printing & Television*, 179.
- ¹⁴⁷ Mortimer, *Colour Reproduction in the Printing Industry*, 32.
- ¹⁴⁸ Hunt, *The Reproduction of Colour in Photography, Printing & Television*, 531.
- ¹⁴⁹ Hurvich, *Color Vision*, 305.
- ¹⁵⁰ Hunt, *The Reproduction of Colour in Photography, Printing & Television*, 22.
- ¹⁵¹ Griffiths, *The Technique of Colour Printing by Lithography*, 21.
- ¹⁵² Denis Baylor, 'Colour Mechanisms of the Eye', chap. 4 in *Colour: Art & Science*, eds. Trevor Lamb and Janine Bourriau (Cambridge: Cambridge University Press, 1995), 125.

RESPONSE TO PRIMARY RESEARCH QUESTION: SUMMARY OF CONCLUSIONS

Primary Research Question

To what extent was colour printing in New Zealand an offshoot of British colour printing, and how closely did development and business patterns follow the parent print culture, particularly in such aspects as the technology, the practitioners, the products and the markets within the period under study?

Section II: Colour Printing Reaches New Zealand

The graphics side of New Zealand printing began within an incipient print culture that was a largely British inheritance around the time of European settlement of New Zealand in 1840. The dominant cultural intention was to continue in the inherited British/European mode which at the time was undergoing changes associated with the industrial revolution, including technological changes in the wider service industry of printing. Part of this was the rapid evolution of the technical processes of colour printing that were beginning to allow the production of more affordable colour than had hitherto been possible.

Influences, particularly those from Australia, were early in evidence in New Zealand: the earliest known graphics printing in the lithographic style was carried out in Wellington by Thomas Bluett from Tasmania, who had nevertheless previously trained with Day and Haghe in London. Such influence from other places had caused continuous cross-fertilisation, albeit often similarly coming from British beginnings. Conditions conducive to the appearance of differences from British print culture were particularly the geographic distance from the parent culture, the need to build the printing industry from scratch in a new socio-economic climate, and a colonial population composed of two cultures with different requirements. However, ongoing written communication particularly in the form of texts, trade journals and personal contacts meant that rather than suffering a complete cultural severance, through shipping links, channels of discourse between printers was maintained and supplies were obtained. In this way, New Zealand print culture, within which colour printing was to appear by the early eighteen sixties, continued with strong ties to the British craft, but from the beginning, was also forging new relationships particularly with the neighbouring Australian colonies whence immigrant printers and lithographers were arriving.

Section III: The Technology: Colour Printing Processes and Equipment

The desire of New Zealand settlers to follow Britain culturally, particularly on the part of the New Zealand Company, included the transfer of embedded technology, although only what was necessary to local needs tended to be transported. At the same time local printing production was adapted to suit two culturally oriented streams: one to fulfil the need for print materials for the Maori people and the other to provide the European population with newspapers and other items, especially those fulfilling practical and business requirements. In the New Zealand colonial printing environment, established after the northern hemisphere invention of lithography, it was found that letterpress and lithographic printing together met most local needs—both were present before European settlement, and were the styles in which colour printing was later largely developed by local New Zealand printers in the period to 1914. Within the British culture, where traditional intaglio printing had been important long before the invention of lithography, gravure colour processes were more in evidence over the same period.

New Zealand printing had begun as an offshoot of the British culture, coming at first with missionaries and settlers, although as a scaled down mainly letterpress and lithographic heritage, but the later transmission of graphics technology required to underpin colour printing, especially that associated with the lithographic and the later photomechanical processes, often initially came to New Zealand via Australia. Here too the dominant British influence from early times was to some extent being cross-fertilised by the presence of immigrants from elsewhere. In addition, immigrants from other countries were bringing technological influence direct to New Zealand, for instance from America and the continent, to hybridise the developing print culture. However, official and personal cultural ties to Britain, the mother country, continued to determine that the influence of British technological colour printing practice had remained strong throughout the period. Influence from across the Tasman continued, but largely reinforced rather than counteracted the bias to British colour printing practice.

It was not until the eighteen sixties, around thirty years after the beginnings of printing in New Zealand, and almost as long after the beginnings of chromolithography in England, that local lithographic colour printing had begun to take root and develop as a predominantly British culture in an Australasian setting. Its viability as a local business prospect began to increase later in the century as colonial New Zealand printers found diverse uses for letterpress and lithographic colour, especially in the context of jobbing printing. Within these technical constraints, New Zealand colour printing development

generally lagged behind trends seen in Britain (and in Australia). Such time-lags were inevitable especially during the initial establishment of the colony where expertise and conditions favourable to the pursuit of cutting edge research had yet to be built. In comparison, within the parent culture much experimentation was taking place in the nineteenth century, particularly into graphics printing methods, including into new ways of printing in colours.

In Britain, the progressive development of the photomechanical processes had occurred across all the main styles of printing during the period under study, and by 1910 had

Very occasionally New Zealand had contributed to cutting edge advances, as in the case of Herbert Deveril who, appointed from Melbourne to the Government Printing Office in Wellington, had been backed by colonial need and government policy of the day as he furthered the cause of the photolithographic methods pioneered in Melbourne by John Osborne, and that soon after were used to underpin local colour printing. However, the smaller population and limited technical means dictated that, generally, New Zealand colour printers had not been able to contribute in the experimental areas to the extent that had been possible for their British counterparts. The occasional appearance of exceptional talent or innovative bent in colonial colour printers who had emigrated from elsewhere or who were New Zealand born had sometimes contributed to a shortening of a timelag between the uptake of a colour process in the parent culture and its appearance in the colony. The presence of Robert Coupland Harding, who had kept close touch with northern hemisphere trends and who had been among leaders in the critique of typographical colour printing internationally, represented such an example of resident influential New Zealand talent of outstanding calibre.

By the eighties and nineties, as colour printing became more internationally oriented, technically, New Zealand colour printers were following international trends, and more influence was arriving from America, but such trends were still chiefly coming to New Zealand via Britain and Australia. International influence received through trade journals was widening, and more colour was being applied to letterpress and lithographic jobbing printing everywhere, including in Britain and New Zealand. The environment of increased communication was contributing to the narrowing of technical time-lags in an age in which faster shipping was shortening delivery times for essential supplies. For graphics printing in particular, the technological quickening of pace, for which the catalyst had especially been photographic and colour knowledge developed in an increasingly international and scientifically oriented experimental arena, had in turn brought increased international influence to New Zealand colour printing.

The time lapse between the uptake of new colour processes in both the letterpress and the lithographic branches of printing had varied between Britain and New Zealand over the study period. However, in general, within these styles, time lags had lessened and providing that a process had been taken up at all, the adoption of colour processes in New Zealand had followed a similar progression to that in Britain. Over the study period, the development of colour printing technology in New Zealand, often first introduced from Australia, had in general followed the British course, with some diversity and individuality introduced from

elsewhere. In the straitened circumstances of colonial printing, relative hardship had often brought out the innovative in the form of improvisation, and ingenuity became a well-known characteristic of the colonial New Zealander, including of the colonial colour printers. Where inventive New Zealand flair born of necessity had been brought to bear, some distinctive local practice had resulted.

Although colour printing technology used in both countries had been similar within the constraints mentioned, colonial timelags remained to a degree throughout the period. As the photomechanical revolution had gathered pace, by the late eighteen nineties 'process' colour had been introduced in New Zealand within a few years of its commercial appearance in Britain. However, by comparison with Britain, New Zealand had generally continued to be, technically speaking, in a following position to the end of the study period. By 1914 colour offset had been in commercial use in Britain for several years, but was just beginning in New Zealand. In both places, combination techniques were in evidence.

Section IV: Colour Printers in New Zealand to 1914

Colour printers were in business in all the main centres of New Zealand during the period studied. In keeping with early economic growth due to the gold rushes, after the introduction of colour printing in the early eighteen sixties, colour printers were more numerous in the South Island, especially in Dunedin and Christchurch. By the end of the century many north island firms were well established, particularly in Wellington and Auckland. But colour printers were present in smaller centers also, early in some South Island towns such as Nelson and Hokitika, and in the case of the lower North Island region, in towns such as Palmerston North and Wanganui.

It had not been so much differences in personal characteristics between Antipodean colour printers and their British counterparts, but in the necessity for adaptation to a new socio-economic environment that led to differences observed between those in the colour printing business in New Zealand and British firms, and their tradesmen. Although training for first generation colonial printers appears to have been typically obtained in Britain, or in the British colony of Australia, colonial constraints had meant that business aspirations of New Zealand printers had generally been more limited than for their British counterparts. Second generation New Zealand colour printers appear to have acquired colour printing skills through in situ apprenticeships, the knowledge base within firms having been built by previous immigrants, but increasingly able to be supplemented by other relevant training obtainable, for instance, as suitable educational and art institutions became established.

Unlike their British counterparts, New Zealand printers wishing to employ colour processes had to cope with a local skill base that was comparatively tiny and therefore precarious in a country where the several nodes of population caused business to be in a dispersed pattern, and where all equipment had to be sourced from overseas suppliers and imported, albeit with local agents acting as middlemen. Because there was less breadth in colour styles being employed in New Zealand, opportunities for colonial colour training were not as wide for New Zealand printers as for the British practitioners, and many colonial career paths tended to follow a more itinerant pattern, especially in the case of employees.

Because many of the early colour printers had themselves been trained in Great Britain, it was essentially British practice that had at first been transmitted to New Zealand, even that coming via Australia. As more time had elapsed after initial separation from the parent culture, and particularly as the photomechanical printing revolution proceeded, New Zealand colour printers increasingly sought information through travel and literature to bridge the communication gap. Shipping routes that were in place primarily to expedite the export of New Zealand primary produce to Britain strengthened communication with the parent culture, and continuing repatriation of colour work to Britain also tended to reinforce British links. However, towards the end of the nineteenth century colour printing practice was increasingly being discussed in international trade journals. Constituting international information systems, these journals facilitated commonality of knowledge and practice rather than increasing existing difference. As printing expertise spread geographically, rather than developing a colour printing culture distinguished by locally distinctive processes, in general New Zealand practitioners were increasingly exposed to a more international outlook as were their British counterparts.

To keep up with the technical advances, New Zealand colour printers, who were more reliant on shipping, the written word, and travelling tradesmen for communications, were obliged to make more effort to keep in touch in order to keep abreast of state of the art technology than was the case for British tradesmen, especially those in London, the major printing node. Although British colour printers also consulted trade literature and travelled abroad in search of information concerning new processes, they rarely needed to look to the Antipodes for the lead, a further disadvantage for those attempting cutting edge technical research in the already less sophisticated colonial printing environment. It seems that those wishing to contribute in the experimental arena were more often obliged to seek collegial support elsewhere, as did Frederick Sears, and as had done the innovative Australian printer John Osborne. For New Zealand colour printers, innovation had centred more around

improvisation, especially of equipment, than around experimentation in new colour printing processes. Rather than assisting in research initiatives per se, New Zealand government policy had tended to favour the achievement of financial efficiency and popularity. Towards the end of the nineteenth century when it seemed that the photographic image had most potential as a means of image-making, it was photography that appeared to receive more government support, particularly as a promotional instrument.

In the colonial New Zealand environment, in which resources were less centralised than in Britain where London was the major colour printing centre, the colour printer faced greater difficulty, not only in procuring the necessities of his trade, but also in updating plant. Advertisements appearing in printed sources such as the trade journals created links between New Zealand printers and particularly British suppliers, but also with suppliers in Australia, America and the continent. Such advertisements, for instance those studied in detail in *Typo*, facilitated colonial access to essential printing commodities, including those particular to the business of the colour printing firms, importantly, coloured inks.

In this study it was seen that in New Zealand a printer was likely to obtain revenue to support such a costly endeavour as colour printing from other activities such as bookselling and stationery manufacture. The case study of the firm of A.D. Willis demonstrated that in this way that firm was typical, as although business included the production of a wide range of colour printed products, rather than resting on such production, colour printing, although important, was an ancillary activity. For colonial New Zealand colour printers, career paths had been less likely to lead to specialisation in colour printing than was the case in Britain.

Section V: New Zealand Colour Print Products in the Marketplace

Print product formats to which colour was typically being added in the period were similar in Britain and New Zealand to 1914. However, with some notable exceptions such as *New Zealand Illustrated* and Featons' *Art Album*, very few elaborately printed coloured books had been viably produced in New Zealand. Although the local market had been at least tested for possibility with respect to nearly every format, including single prints and multiple volume coloured books, rather, in New Zealand colour printing had been confined more to local practical requirements such as the plans and maps that could be lithographically produced and the numerous ephemeral items that came from letterpress and lithographic jobbing printing.

Through examination of a range of the colour print products that had been presented to the marketplace of print, it was apparent from this study that important global, technological

and local factors had driven colour printing, many of them common to both places. The general public as a market segment, the fact that the general readership was demanding graphics, and colour itself as a market driver were factors seen to be operating in New Zealand. These factors had also been common to the British marketplace of print. Technological drivers, including the succeeding graphic fashions and possibilities, as well as the generally high cost of colour processes, were important drivers in both places, and, on the part of printers, local competitive edge and professional pride. Other factors included local cultural and artistic taste, the environment (both social and physical), and matters of kinship and nostalgia. It was especially because of cultural ties that the inhabitants of the British Isles were seen as future visitors to New Zealand—the travellers that would feed the fledgling New Zealand tourist industry. Early identified as desirable to colonial economic health, the tourist trade that began in the later nineteenth century had generated extra business for colonial colour printers. Whether in Britain or in New Zealand, the colour printer took advantage of a market niche perceived, and some New Zealand items in colour had been produced in anticipation of also serving British markets.

Print products tailored to local demand and often featuring local images had been produced using a variety of available technologies in each place. However, once again, the limiting factors present in New Zealand—isolation from the larger markets, and the small local population—had dictated that colour was appearing from the colonial printers in a more circumscribed way than was the case in Britain. For New Zealand image-printing the need for economic caution had meant that rather than in a succession of colour plate books, private commercial colour printers had employed unique New Zealand subjects in such smaller items as Christmas cards, posters, catalogues and food labels. The case study of the lower North Island printer A.D. Willis, whose specialty was colour printing, and who endeavoured to follow British technical trends, possibly planning colour products as demonstrated by the firm of Eyre and Spottiswoode where he had briefly trained, highlighted the fact that in New Zealand a greater prudence had been necessary, particularly in the matter of the production of coloured books for the local market than had been generally necessary in Britain. Officially, Government printers had particularly employed printed colour in the production of maps and postage stamps. However, some enterprising colour printing was also found in pockets of book production such as the effective colour seen in the annual *New Zealand Official Year Book*. As in Britain, in keeping with international trends, colour was being used informationally by New Zealand printers in such items as scientific publications and the locally printed maps.

However, items produced by New Zealand colour printers from jobbing printing for wider general distribution had been similar to those produced in Britain, though with a New Zealand flavour and tailored to the smaller local marketplace of print. For the popular market the magazine format that had been used as a vehicle for colour in Britain, as seen for instance in the English *Graphic*, had also provided colour printers throughout New Zealand with one of the most successful means for the circulation of coloured images of a uniquely New Zealand character. It had been the coloured supplements associated with the special numbers of the weekly newspapers that had been increasingly used by local firms to bring colour to the mass marketplace of print, especially from the late eighteenth century onwards. Particular subjects that frequently had received colour treatment included depictions of the natural New Zealand environment, the Maori people, new townscapes and local historical incidents. Such images also had acted as the springboard for the occasional local effort to produce a book in the manner of the nineteenth century British colour plate books. But in the main, New Zealand colour printers had responded to marketplace differences by appropriately cutting format costs. Consequently local colour printing had typically found more expression in ephemeral items, although because the prints and decorative maps produced in association with the special numbers and supplements of the weekly newspapers, for example, the Auckland *Weekly News*, had been successful, within that genre, colour printed items produced became an enduring feature in New Zealand in the study period.

Section VI: Standards and New Zealand Colour Printing

For colour printing in both New Zealand and Britain, standards played several roles. Not only did standards affect the accomplishment of optimum print communication, but also facilitated achievement of the reliable physical uniformity that was found desirable for planning and pricing strategies, and for setting benchmark quality levels. In turn these served as baseline measures against which desirable improvement could be discerned. Such demonstration of the possibility of improvement was also likely to have acted as a spur to further effort on the part of the printing trade.

Alongside ongoing diversification in the increasingly complex and often experimental technical environment both in New Zealand and in Britain, education was considered to hold the key to the improvement of colour printing standards. Printed sources, especially authoritative texts and trade journals, had been especially important in bridging the communication gap caused by the isolated New Zealand setting, a factor that, in comparison to the opportunities available for colour printing training in Britain, otherwise had

potentially inhibited the continuing education of the colonial colour printer. The New Zealand journal *Typo*, published by the local printer R.C. Harding, had aimed to facilitate the improvement of standards especially in the area of design and decorative printing, and was especially valuable, not only because of its educative stance but also because of Harding's expert wisdom and his insight into the situation of the colonial printer.

By the time colour printing had taken root and was increasingly practiced in New Zealand, standards in both New Zealand and Britain had been variable in the last two decades of the nineteenth century. Although due partly to the intensifying experimental climate, not unexpectedly, colonial standards were often seen to be generally below what was being achieved in Britain, in keeping with New Zealand's following position in the technical sense. However, as pointed out by R.C. Harding, individual colour printers capable of praiseworthy standards were to be found in both places.

Insights gained from the colour printer William Seeney's retrospective assessment pointed to the fact that colour printers in both New Zealand and Britain had shared many common problems. In both these printing environments, the human element was frequently a factor that was seen to affect the achievement of high standards in colour printing. Not least, excellence of colour vision was essential to the colour printer, especially in the context of the manual colour printing systems, where, for instance, it was vital to the colour correction procedures of the period.

An understanding of the mechanism of colour vision has recently become possible and has thrown light on matters such as the part that colour vision played historically in colour printing, and enables explanation of the problems that remain as barriers to the achievement of the perfect colour reproduction system whether in Britain or New Zealand. Such understanding has allowed insight into the problems experienced in the development of reliable colour printing systems on both sides of the globe, as well as explanation of the basis upon which colour compromise decisions, in some circumstances found necessary to economic production, actually rest. Such insight also underpins an appreciation of the difference between attributes that are physically determined and those that can be acquired by training, and is essential to the understanding of the relative efficacy of various colour printing processes as they were employed by the printers who brought colour to the marketplace over the study period.

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APPENDICES

Appendix 1A
Figure 9: Comparative Chronology:
Colour Printing in Britain and New Zealand Pre-1830.

Year	Britain & Europe: General Developments	Britain & Europe: Colour Printing Developments	New Zealand in an Australasian Setting.
1672		Sir Isaac Newton communicates his discovery that white light contains all wavelengths in the visible spectrum, and that refraction through a prism disperses it into the component chromatic electromagnetic wavelengths that can be recombined to form white light.	
1704		Jacques C. Le Blon, from Frankfurt, applies Newton's theory to colour printing and produces his first specimen three-colour prints by an overprinting process.	
1719	Jacques C. Le Blon comes to England.		
1754		John Baptist Jackson's <i>Essay on the Invention of Engraving and Printing in Chiaroscuro</i> is published.	
1768			Between 1768 and 1780, Cook collects around 3000 images of new mainly Pacific natural phenomena.
1739	Thomas Ged of Edinburgh first invents stereotyping.		
1773			Engravings from the South Seas shown in a London publication.
1788			The first fleet sails for Australia with a printing press.
1795		Rudolph Ackermann from Saxony establishes a print shop in London: produced numerous hand-coloured aquatints.	First attempts at Australian letterpress printing are made by George Hughes in Sydney with a Government owned press.
1797	White-line, end-plank wood engraving techniques in the manner of Thomas Bewick that had been introduced in the last quarter of the century, are used, for example, for the illustration of the <i>History of British Birds</i> , published 1797-1894.		
1798	Alois Senefelder begins experiments that lead to the development of lithographic printing.		

1800	Lord Stanhope's all-iron lever press is tested at the Bulmer printing office.		
1801	Alois Senefelder takes out an English patent for the process of lithography. England is the first country outside Germany to have a lithographic press.		
1802	Thomas Wedgwood and Sir Humphrey Davy achieve a first step towards photography—contact images on paper.		The first local print of Sydney, an engraved view, is produced in Australia by W.S. Blake. The first letterpress official book in Australia is printed by George Howe in Sydney.
1803	The first practical paper making machine is pioneered by the Fourdrinier brothers and others in England.	William Savage sets up London business, and conducts experiments in the manufacture of coloured inks. One of the first attempts at lithographic colour made in England: red is used in <i>Specimens of Polyautography</i> .	The first official newspaper in Australia is printed by George Howe in Sydney: the <i>Sydney Gazette and New South Wales Advertiser</i> . The first printing press is landed in Victoria at Sorrento on October 9 th by Colonel Collins, and the first printing produced on 16 th by George Clark: 'Garrison Orders.'
1805	Professor Mitterer of Germany promotes and names lithography. Lord Stanhope converted Firmin Didot's stereotyping process, bought in 1804 by Cambridge University, to a commercial process.		
1808		First coloured lithograph of any importance using four colours is printed by Strixner and Piloty in Munich : margin illustrations for a prayer book.	
1809	The War Office becomes the first body to set up an English lithographic press.		
1810			
1814	Friedrich Koenig's steam-run cylinder press is first used to print a newspaper, the <i>London Times</i> .		Samuel Marsden first preaches Christianity in New Zealand.
1815			The first missionary settlement is established in New Zealand.
1817	The iron Columbian press, first introduced in Philadelphia, reaches Europe.		
1818		J.A. Barth of Breslau produces the first chromolithographed borders for <i>Pacis Monumentum</i> , a collection of poems.	

1819		Alois Senefelder's manual, <i>A Complete Course of Lithography</i> which describes various methods of printing in colours is published in English.	The first book is printed in Tasmania.
1820	<p>The iron Albion press is introduced around this time by R.W. Cope— later to be used by William Morris.</p> <p>Paris is becoming the leading world centre for lithography.</p> <p>In England J.D. Harding and Charles Hullmandel begin collaborative work.</p>	To defeat forgery, William Congreve patents an improved, complex method for banknote printing (first patented by him in 1819) involving 'rainbow inking'.	
1821			Two lithographic presses are brought out to Sydney by the governor, Sir Thomas Brisbane.
1823		<p>Both parts of William Savage's <i>Practical Hints on Decorative Printing</i> are completed. Contains many chiaroscuro prints and prints produced from numerous wooden blocks.</p> <p>Firmin Didot prints a map in colours using a composite intaglio and relief method which he patents.</p>	
1824			Thomas Bock introduces engraving in Tasmania.
1825		After 1825, aquatint begins to decline in England.	The first lithographic prints in Australia are produced by the artist Augustus Earle.
1826	Joseph Nicéphore Niépce first invents a process to make permanently fixed images via use of a camera.		
1828		<p>Franz Ritter von Hauslab first introduces colour lithography for map making in Vienna.</p> <p>Two-colour lithographic map printing is probably used in Freiburg by Woerl and Herder.</p>	
1829	Lighter paper maché now used for matrices.		

Appendix 1B

**Figure 10: Comparative Chronology:
Colour Printing in Britain and New Zealand in an Australasian Setting: 1830-1865.**

Year	Britain & Europe: General Developments	Britain & Europe: Colour Printing Developments	New Zealand as part of Australasia: General Printing Developments	Developments in Australasian Colouring and Colour Printing
1830	Around this decade, metal plates (at first zinc) are first introduced in England to substitute for limestone. Power platen presses are first in use.	By this decade, colour processes being explored are laying the ground for viable colour printing for mass production, for example, in Munich, Franz Weishaupt's attempts to adapt Le Blon's three colour principle to lithographic printing. Coated art papers are first introduced.	The first printing is accomplished in New Zealand: Reverend William Yate and his assistant James Smith prints hymns and a catechism in Maori at Kerikeri. Penfolds printery is established in Sydney.	
1832		William Savage's <i>Preparations in Printing Ink in Various Colours</i> appears. Thomas de la Rue patents a method of printing coloured playing cards using strong, quick-drying oil colour inks, and uses a pin system to gain accurate register for this early form of English chromolithography. Rare examples of prints concerning New Zealand are produced using aquatint: for Augustus Earle's <i>A Narrative of Nine Month's Residence in New Zealand in 1827</i> , pub. in London by Longman.		The first map to be published in Australia, 'Map of the Town of Sydney' in <i>The New South Wales Calendar and General Post Office Directory</i> , is hand-coloured.
1834			William Wade brings a lithographic press to New Zealand. William Colenso arrives in Paihia on 30 th December.	
1835	William Henry Fox Talbot experiments in photographic processes.	George Baxter patents his Polychromatic printing process in Britain. By June 1835, Charles Hullmandel first uses chromolithography to colour book plates for George Hoskins's <i>Travels in Ethiopia</i> .	Illustration appears on William Colenso's first Paihia printing of the Maori translation of the <i>Epistles to the Ephesians and Philippians</i> . Birth in Tasmania of the first Australian-born photographer, Alfred Bock.	
1837	Louis Daguerre makes daguerreotype on copper sensitized with silver.	Godefrey Engelmann obtains a ten year patent for his process of chromolithography in France.	Around this time, attempts are made in Sydney to manufacture printing ink.	

1838		Charles Knight patents the colour printing process 'Patent Illuminated Printing'.	Engraving is introduced in Melbourne by Arden and Strode.	
1839	Electrotype is invented.	Charles Hullmandel's chromolithographic success: Thomas Shotter Boys' <i>Picturesque Architecture in Paris, Ghent, Antwerp, Rouen</i> is published. Charles Knight's patent illuminated maps are produced at Clowes by one impression printing. (Illustration)	The first lithographic printing known in New Zealand, a lesson sheet, probably produced by Robert Maunsell, is printed on William Wade's lithographic press. The first book is printed in Melbourne, a 23 paged pamphlet "Articles and Rules for the Regulation of the Melbourne Union Benefit Society."	
1840	Letterpress printing until this decade is almost entirely monochrome: delayed by the scarcity of suitable coloured inks. By this decade, the main art techniques for drawing on stone are in existence. Wood pulp now used for paper manufacture.	Charles Hullmandel patents the litho-tint process in England. Illustrations of presses adapted by Engelmann for lithographic colour work are published in <i>Trait de Lithographie</i> . Colour lithography for map printing spreads to Philadelphia in this decade. Posters begin to appear in two or three colours in the early 1840s.	January 29 th 1840: William Hobson lands at the Bay of Islands. 6 th February 1840: the Treaty of Waitangi is signed. The New Zealand Company settlement is established at Port Nicholson (Wellington) The first newspaper in New Zealand is printed at Wellington on 18 th April: the <i>New Zealand Gazette and Britannia Spectator</i> . By the 1840s and 1850s, images of Australia are now more generally published locally rather than exclusively in Britain.	An early New Zealand print in tints with colour added from the press: 'Birdseye View of Port Nicholson', probably originated by Charles Heaphy and others in New Zealand during Colonel Wakefield's survey in 1839, is drawn and lithographed in London by T. Allom, probably first lithographed in tints by C. Hullmandel, and published by F.G. Moon in 1840, with added hand-colouring.
1841	William Savage's <i>A Dictionary of the Art of Printing</i> is published. Hansard's <i>Treatise on Printing</i> is published. Fox Talbot patents calotype process.			The first known lithographic print, chart, plan and map are produced in New Zealand by J.W. Jones and Thomas Bluett who used zinc transfer technology in Wellington. Hand colouring is used.
1842			Alexander Thomson begins the first Australasian type foundry in Sydney between 1841 and 1843. Some types produced here are exported to New Zealand.	Thomas Bluett, originally from London, prints John Skinner Prout's lithographs in two shades of sepia in Tasmania for <i>Sydney Illustrated</i> .

1843		In Paris a geological map is produced in eleven colours by overprinting in four impressions.	Thomas Ham had arrived in Melbourne from England; sets up an engraving business: 1843; later begins lithography. The earliest known Melbourne lithographic prints are executed by Henry Lingham for the <i>Port Phillip Magazine</i> .	
1844	The first book illustrated with calotypes pasted in is produced: Fox Talbot's <i>Pencil of Nature</i> .		Thomas Ham advertises as a printer of lithographic views.	
1845		Chromolithographic colour blending techniques have begun. The indispensability of colour for maps, especially for geological maps, is pointed out in the <i>British Journal of the Royal Geographical Society</i> .		John Skinner Prout is credited with printing the first lithograph in colours in Australia.
1847			Thomas Ham engraves, prints and publishes his first map: 'Map of Australia Felix.'	
1848	The rotary press is invented.			
1850	Ferguson Branson is making intaglio nature prints in Sheffield. In Vienna Alois Auer later improves these techniques. Map printing by lithography is delayed until the mid-nineteenth century due to the popularity of the steel engraving processes invented around the turn of the 19 th century. Robert Langton is experimenting with photographic processes for relief printing from the early fifties. Early experiments are made from the fifties to apply photography to the mechanization of the production of tonal contrasts for graphics printing.	By mid-century, supply of inks suitable to colour printing is more possible. The popularity of topographical images is at its height in Britain.	After 1850, the arrival of trained lithographers in Australasia further facilitates a local preference for lithographic printing for graphics. The <i>Charlotte Jane</i> arrives in Christchurch with a letterpress printing press aboard. By the fifties, lithography becomes the principal process used for local map printing in Australian Government Departments. The <i>Herald</i> imports the first steam-printing press into Australia, a Napier Improved. From the mid 19 th century Australian firms begin to manufacture copies of European printing press designs.	

1851	<p>The Great Exhibition is mounted in London at the Crystal Palace, and features colour printing.</p> <p>The London branch of the Glasgow firm, Miller, Buchanan & MacGregor are the first firm in the UK to use power printing for lithography.</p> <p>Frederick Archer invents the collodion wet-plate process for photography.</p> <p>Powered lithographic printing comes to Britain in the early fifties, after Sigl's powered lithographic press is introduced on the continent in 1851 and patented in 1852: imported in 1851 by McLure, McDonald and McGregor who bought a Sigl press in 1851.</p>	<p>The stimulation of the Great Exhibition leads to a greater commercial use of chromolithography to colour print products for the mass market.</p> <p>Joseph Aresti executes the first geological map to be colour printed in Britain: the first edition of Robert Mylne's 'Geological Map of London.'</p>		
1852	<p>Early experiment by Fox Talbot into using photographic processes to print half-tones.</p> <p>The asphaltum method of photo-lithography is patented.</p> <p>Alois Auer patents a process of nature printing in Vienna in the name of his assistant, Andrew Worring.</p>	<p>Chromolithographic style changes of the 50s and 60s are seen, for example, in Turner's 'A Vessel Burning Blue Lights' which was printed by Day & Son without a black outline—in modern style.</p>		
1853	<p>Henry Bradbury brings Alois Auer's improved method of nature printing back to England and patents the process.</p>		<p>Gold is discovered in Victoria.</p> <p>Frederick Proeschel, a Frenchman, had arrived in Melbourne via America in 1852 and establishes his map printing business by 1853.</p>	
1854	<p>Paul Pretsch from Vienna comes to England and takes out a patent for a process, photo-galvanography, used to obtain prints from an intaglio surface. He is the first to market such prints.</p>	<p>An English translation of M.-E. Chevreul's treatise: <i>The Principles of Harmony and Contrast of Colours, and their Application to the Arts</i> appears.</p> <p>Henry Bradbury's first folio volume contains full colour nature-printed plates. (Illustration)</p>		<p>The flawed 4d lithograph (stamp) is printed at the Surveyor General's Department in Perth: 1854-55.</p>

1855	<p>The British Ordnance Survey Department first investigates and uses a photographic method for map reduction.</p> <p>Alphonse Poitevin patents a photographic process for manufacture of planographic image printing surfaces that was the basis for the later collotype processes.</p>	<p>By the mid-fifties, chromolithography has so advanced that it is ousting block and metal printing.</p> <p>Firms such as Leighton's are executing colour typography.</p> <p>Colour supplements for the <i>Illustrated London News</i> are appearing; also printed by Leightons.</p>	<p>Johann Degotardi, engraver, lithographer and photographer, from Slovenia, sets up in business at the Sydney Printing House.</p>	<p>By December 1855 A.J. Richardson had printed just over 29,000 1d stamps of good quality in deep red in Auckland from intaglio plates produced in England.</p>
1856		<p>J. Aresti uses three-colour theory to produce an early overprinted three-colour chromolithograph.</p> <p>The English chemist William Perkin discovers aniline purple, which leads to the foundation of the aniline synthetic dye industry.</p>		
1857	<p>John Pouncey coins the term photolithography.</p>	<p>Paul Pretsch's intaglio process is further developed by the London lithographers, Lewis and Böhm, to supply colour to prints made from the process: the first example of colour being added by means of the press to photo-mechanical prints.</p> <p>In Edinburgh, Burnett proposes a photo-chromolithographic process for colour printing.</p>	<p>The first payable goldfield in New Zealand is opened at Collingwood.</p>	
1858	<p>Wharfedale cylinder printing presses first become available in England.</p>			
1859			<p>Photo-lithographic transfer methods are pioneered in Melbourne by John Osborne who patents a viable transfer process for map and plan printing in September: later used at the Government Printing Office in Wellington, N.Z.</p>	<p>At the Geological Survey of Victoria, Thomas Ham is the first to colour print geological maps. In up to seven colours, they were of the Melbourne and Kyneton areas.</p>

1860	<p>The British Ordnance Survey Department produces its first zincograph using a transfer method.</p> <p>Power presses have begun to be used in Britain for map printing.</p> <p>Woodburytypes are used for book illustration from the sixties; produced from an early photographic intaglio process.</p> <p>The first reprographic cameras are introduced.</p> <p>Photography on the block is in use by this decade.</p>	<p>The introduction of jobbing platen presses enable lithography to be employed for a greater variety of ephemeral print products: jobbing colour work becomes cheaper and faster from this time.</p> <p>The firm of Day & Son begins use of photographs as the original for illustrative processes, including for intaglio and chromolithographic methods of colour printing.</p> <p>Experimentation with colour photo-zincography begins in the sixties., with the <i>Domesday Book</i> produced in two colours.</p> <p>By the eighteen sixties in Holland the Eckstein process provides for the lithographic printing of multi-colours by a three-colour process in which the colour was applied from three stones, one for each of the primary colours, red, blue and yellow, "whereon a parallel line screen of uniform density had been drawn mechanically and subsequently etched."¹</p> <p>Woodcut letters facilitate printing relief colour.</p>	<p>The Sydney printer Johann Degotardi mentions success for the use of native iron-bark as a substitute for boxwood for wood engraving.</p> <p>The first two-feeder flat-bed Wharfedale presses are introduced in New Zealand.</p> <p>A Board of Enquiry explores John Osborne's new photolithographic process in Melbourne.</p> <p>Steam power is introduced in New Zealand to drive printing plant in this decade.</p>	<p>Alfred Bock experiments in Tasmania with the production of colour sennotypes.</p> <p>Steam power lithography enables faster colour printing of maps for the Melbourne Geological Survey.</p> <p>Ward and Reeves, produce the 'Geological Sketch Map of the Province of Wellington, N.Z.' around this time, likely to have been the result of very early attempts at colour printing by this firm, and, probably among the first local attempts to add several colours for a single item from the press. Dated by Brian Lovell-Smith as 'ca 1860?' the ten shades used for this map were juxtaposed.</p>
1861		<p>James Clerk Maxwell demonstrates, for white light, the three colour separation (and re-combination) principle later applied to colour printing.</p> <p>The firm of Waterlow acquires a two-colour machine designed by Conisbee: the first successful such machine.</p>	<p>Gold found at Gabriel's Gully in May 1861 by an Australian prospector sparks the Otago gold rush.</p>	<p>Hodgson and Friend of Nelson first produce a chromolithographed item 'Timetable for the Dun Mountain Bus', probably in this year.</p> <p>Johann Degotardi, colour printer of Sydney, publishes his <i>The Art of Printing in its Various Branches: With Specimens and Illustrations</i>.</p>

1862			The first printers' union in New Zealand is formed in Dunedin, probably in early 1862.	<p>A lithographic work in tints, 'Panorama of St. John's College', is produced around this time by the Auckland artist Miss Cotton.</p> <p>Two colour stamp printing from the English plates was carried out for an N.Z. light blue and lilac threepenny in 1862.</p>
1863			<p>J. Degotardi uses photolithography to print a map published by the Sydney firm F.H. Reuss & J.L. Browne.</p> <p>By this time, lithographic processes are used for map and plan printing at the New Zealand Survey Office, Government Buildings.</p>	<p>The <i>Southern Monthly Magazine</i>, printed and published in Auckland with tinted lithographic illustration, begins.</p> <p>Maps lithographed by J. Varty of Auckland appear handcoloured in the New Zealand <i>AJHRs</i>.</p>
1864	In England, Joseph Swan patents a process enabling the printing of toned photographic images, by means of which copper plates can be etched.			<p>The first collection of chromolithographs are published in Australia in Melbourne 1864-65: <i>Album of Chromo Lithographs</i> by Nicholas Chevalier.</p> <p>The Melbourne <i>Argus</i> reports that John Osborne, while working in Berlin, has developed his photo-lithographic process for colour.</p> <p>Tint colour from the press is being added to maps for publication in the NZ <i>AJHRs</i>.</p>
1865		<p>An invention incorporating the collotype process as a basis for colour printing is made by Mothay and Marechal of Metz around this time.</p> <p>The first suggestion of three-colour printing is made in Vienna by Baron Ransonnet.</p>	<p>Wellington becomes the capital city of New Zealand.</p> <p>George Didsbury becomes Government Printer: the Government Printing Office is now in Wellington.</p> <p>The first Wellington printers' union is formed around 1865.</p>	<p>The Christchurch firm of Ward & Reeves receives a bronze medal at the New Zealand Exhibition in Dunedin, for "the successful introduction of Chromo-lithography into New Zealand."²</p>

¹ David Woodward, *Five Centuries of Map Printing* (Chicago: University of Chicago Press, 1975), 147.

² New Zealand Exhibition, *Reports and Awards of the Jurors* (Dunedin: Mills, Dick for the Jurors, 1866), 516.

Appendix 1C
Figure 11: Comparative Chronology:
Colour Printing in Britain and New Zealand 1866-1914.

Year	Britain/Europe: General Developments	Britain/Europe: Colour Printing Developments	New Zealand as part of Australasia: General Printing Developments	New Zealand in Australasia: Colour Printing Developments
1866			Photo-lithography is officially in use at the Surveyor General's Office in Melbourne. A steam-powered press is introduced into the N.Z. Government Printing Office.	Colour-printing is used occasionally in N.Z. for maps by firms able to carry it out, such as the Christchurch firm of Ward & Reeves which prints a folding map for the 1866 <i>Haast Report</i> in chromo- lithographic colour.
1867	Adolphe Goupil buys the woodburytype patent & produces photo-mechanical toned intaglio prints; hand-work is still required.	<i>The Chromolithograph</i> , devoted to the colour printing process of the title, is published: runs to 1869.	Establishment of a Lithographic Branch at the New Zealand Government Printing Office.	The Melbourne firm of J.W. Pearson produces <i>Pearson's School Atlas</i> around this time.
1868		William Griggs works on photo-lithographic processes and develops it for high standard colour printing.		Fergusson and Mitchell produce illustrative tinted lithographs in Dunedin for Vincent Pyke's <i>Province of Otago</i> , the drawing carried out by artist George O'Brien.
1869		Theories of three-colour printing by photographic separation are announced by Charles Cros. Louis Ducos du Hauron sets out theories of additive and subtractive colour in <i>Les Couleurs en Photographie</i> .		
1870		Colour collotype is begun by Josef Albert of Bavaria. In France, the process of zincography for printing colour maps is in use by the seventies. Mechanical tints, eg. stippling and graining introduced at least by this time.		Chromolithographed maps produced by Mills, Dick, Lister & Co., in Dunedin are published in the New Zealand <i>AJHRs</i> .
1871		Intaglio Autotype prints, first produced in the sixties, now can be produced in a wider range of colours than available for albumen prints.		
1873		In Berlin, Professor Herman Vogel finds that photographic plates can be made sensitive to different portions of the spectrum.	Herbert Deveril arrives in Wellington. Canterbury College established.	
1874				<i>The Atlas of the Settled Counties of New South Wales...</i> compiled by the Sydney firm of Basch and Co. is published in 1874 containing the note "This atlas is the first that has ever been produced in the colony".
1875	The Frenchman Charles Gillot is the first to produce metal relief printing plates by photographic means. Robert Barclay of London begins lithographic offset printing on tin.		Herbert Deveril's paper on his improvement of the photo-lithographic processes is published, and maps printed from his process are published in the <i>AJHRs</i> .	

1876	Photo-engraving to make relief line-cut process blocks is introduced to England from France about this time for image printing.		The first commercial paper mills in New Zealand are established at Woodhaugh in Otago and at Matura in Southland.	In N.Z., G.T. Chapman publishes a tinted lithograph, "Chromo-lith. By W.C. Wilson": essentially a lithograph in tints in which a stipple style of lithography is used to employ extra colour to indicate the tonal contrasts. (Ch. 11.) 'Sketch-map of New Zealand North Island Shewing the County Boundaries in Accordance with the Counties Act 1876' is "Photo-lithographed at the Gov ^t Printing Office, Wellington, N Z by H. Deveril" and chromolithographically printed in four shades: grey, pink, yellow and tan, in addition to the black used for the text and the outlines.
1877		Intaglio colour Goupil prints are produced by now in Paris.	The Fine Arts Copyright Act is passed in New Zealand.	
1878				Relief stamp printing is adopted in New Zealand, using dies cut in Wellington by Bock and Cousins for a red 2s. stamp and a deep grey 5s.
1879	Karel Klic of Switzerland experiments in intaglio photogravure processes.	The Goupil process is used in England by now under the name photo-mezzotint.	The first edition of the <i>Handbook of New Zealand</i> by James Hector contains maps photo-lithographed by Herbert Deveril.	
1880	Wood engraving begins to decline due to the introduction of the photo-mechanical techniques from this decade, and there is an increase in lithographic printing of images. The first photographic film is available.	Two cylinder machines for colour printing are introduced in Massachusetts, America by Huber and Hodgman in this decade. In Zurich in the eighties, an early photographic/lithographic process for colour printing is developed called Photochromy.	Wimbles in Australia becomes another important source for printing presses required by New Zealand printing firms by this decade. Around this time small rolling presses are in use in N.Z. probably for pulling proofs.	
1881	Frederick Ives of Philadelphia patents a commercial method for the relief printing of half-tones using dots.	Frederick Ives has first employed three single line screens for a three-colour process to make a coloured half-tone.	A New Zealand Typographical Association is formed.	A letterpress programme is printed by the Wanganui printer, H.I. Jones in several coloured inks for the Wanganui Exhibition of Art, Science and Industry in aid of the Wanganui Public Library.
1882	In England and Germany, George Meisenbach first patents a half-tone relief process using a cross-line grid.		A lithographic department is established at Whitcombe and Tombs in Christchurch. A School of Art is established in Canterbury: trains many tradesmen for industries requiring art knowledge.	Colour letterpress around this time is exemplified by a two colour letterpress calendar in black and red printed at the Lyttelton Times office.
1883		William Griggs is working on tri-chromatic photo-lithography in London.	Electric light is installed at the Government Printing Office in Wellington.	At least from 1883 A.D. Willis publishes chromolithographed Christmas cards and the first colour printed townscape known to have been produced in New Zealand.

1885	<p>Around this time Ben Day grained films are introduced.</p>	<p>By the mid-eighties, Frederick Ives has adapted the cross-line screen process to produce colour half-tones in America.</p> <p>Prof. Vogel has established that compatibility between the sensitive dyes used to make the photographic plates and the dyes used in the printing inks were important.</p>	<p>The paper mill, Fergusson and Mitchell in Otago, manufactures the first printing paper for the Wellington Exhibition.</p>	<p>The 'Birdseye View of Greymouth Harbour Shewing Proposed Works' is chromolithographed by Lyon and Blair of Wellington in two blues, yellow, brown, red, pale orange and green, (not produced by overprinting) and with the key, that had probably been transferred to the printing surface by photographic means, printed last in black in a style reminiscent of that used for the A.D. Willis chromo- lithographs in the same decade.</p>
1886				<p>At the firm of A.D. Willis, by September 1886, William Potts reproduces the painting by Charles Blomfield of Tarawera in eruption.</p> <p><i>The New Atlas of Australia</i>, is produced in Sydney by the firm of John Sands, with the colour printing for maps and plates achieved using the chromolithographic method.</p>
1887				<p><i>Typo</i> begins publication in Napier and runs until 1897. Contains much for the colour printer, including its own colour printed title-pages.</p> <p><i>The American Lithographer and Printer</i> is reported in <i>Typo</i> in May 1887 as indicating that a steam press had been invented for offset lithography, and that the process was being used for colour printing.</p> <p>Mechanical tints are being used by New Zealand colour printers by this time, by Henry Brett of Auckland, for the coloured lithograph 'Ngatapa from the East', prepared tints were partly used to colour a key taken from a pen and ink drawing by J.C. Richmond that had been printed in brown. This print had been produced at Henry Brett's Star Steam Printing Company for publication in T.W. Gudgeon's <i>The Defenders of New Zealand</i>. (Ch. 11.)</p>
1888		<p>The <i>British Printer</i> begins publication in London: contains much for the colour printer.</p>	<p>The Auckland firm of Charles Spencer commences the collotype process for image production: this marks the beginning of tonal photo-process work in N.Z.</p>	<p>Bock and Cousins produce an opera programme for the Wellington Amateur Operatic Society in 1888: this New Zealand item appears to have been block printed in colour on fragile paper.</p>
1889			<p>The New Zealand and South Seas exhibition in Dunedin: 1889-1890.</p>	

1890	From this time, half-tone block printing is taking over from wood engraving for the production of relief images in England.	Standards are beginning to be introduced for printing inks and colour screens. Colour collotype begins to gain acceptance in England by the nineties.	Master Printers' associations are formed in Dunedin, Christchurch and Wellington. <i>Typo</i> reports the development of artificial lithographic stone by the German firm of Wezel and Naumann. R.C. Harding reports an important improvement in machinery: an automatic feeder suited to the Wharfedale. Frederick Sears sails for New Zealand from Queensland.	In May 1890, R.C. Harding mentioned that he had received some "very fine prints, produced by the heliotype process" from C. Spencer of Tauranga, who appears to have used the process as a basis for colour printing.
1891		By 1891, the German lithographer Ulrich had shown the promising results of adding a greyish tint to three-colour printing, thus heralding a four-colour process. Continental printers are making three-colour relief prints: eg. Albert of Munich, Angerer and Goschl of Vienna, Husnik and Häusler of Prague.	William Day, a Printer's Manager, listed under "New Zealand Inventors" applies for a patent for an "Improved Blocking Press".	Marinoni web perfecting machines are being imported for colour work by the Victorian Government.
1892		The <i>British Printer</i> has examples of colour illustrations printed from grained relief blocks by Waterlow & Sons: the screenless process of Chromotypy: introduced from the continent and also used in America and Ireland probably at about the same time. Used commercially by the Photochromatic Printing Co. of Belfast, and Waterlow & Sons in London. Early colour half-tone blocks for relief colour printing begin to appear in Britain.	John Taylor arrives in Christchurch from Melbourne to head the lithographic department at Whitcombe and Tombs, and secretly experiments in half-tone processes with W.J. Edwards.	
1893		A genuine tri-chromatic print appears from Husnik and Häusler of Prague in the <i>British Printer</i> : after this the use of colour process blocks increases in Britain towards mid-decade.	The Auckland <i>Graphic</i> features half-tone images in annual Christmas supplements.	
1894			The Christchurch Press is the first N.Z. paper to use half-tone images on a regular weekly basis. Frederick Sears had been in Government employment in New Zealand, from June 1894 to Dec. 1902, as a temporary lithographic draughtsman in the Lithographic Branch in Wellington. Trade classes are first held for printers' apprentices in Melbourne in the Atheneum, Collins St.	

1895	Karel Klic and Samuel Fawcett make the first successful photo-gravure prints, in Lancaster.	<i>The Penrose Annual</i> begins publication in 1895 as the <i>Process Work Year Book</i> . Contains much for the colour printer: 'Process' is considered to be established. Photo-chromolithography is patented by Ernest Nister in Nuremburg. Geological Survey of Great Britain adopts colour printing.	A.D. Willis uses collotype by this year. R. Hoe & Co. of New York rotary presses are beginning to be imported to N.Z. for newspaper production around this time.	
1896		In England The Photocrom Company produces commercial colour photo-collotypes and photo-chromolithographs.	Alexander Sturdivant, brought the copper etching techniques that were to be a great advance from swell-gelatine block-making methods to N.Z.	Ernest Moss first produces three-colour half-tone blocks in New Zealand over the period 1896-97.
1897			Wet-collodion photographic methods are first introduced in Christchurch; already in use in Auckland.	
1898				William A. Taylor takes his father's work forward in Christchurch, and is the first in New Zealand to produce three-colour half-tones from zinc engraved blocks for a coloured catalogue produced by Alex. Wildey and Company in Christchurch. Alexander Wildey also produces tri-chromatic images around this time from Mr. Moss' process blocks produced at the Photo Engraving Company.
1899		Colour-sensitised collodian emulsion developed for colour plates by Dr. E. Albert of Munich, is first introduced in England by The Penrose Company.	Classes for printers' apprentices commence in Melbourne in 1899 at the Technical College, then known as the Working Men's College.	
1900		Around the turn of the century, chromolithography is used to colour half-tone blocks: the Autochrom process, often used for picture postcards. High standard colour gravure is being achieved in England, America and on the continent by the early years of the century.	In New Zealand, Wharfedale machines are still dominant at the turn of the twentieth century. In this decade, separate lithographers' unions are formed in Auckland and Otago.	
1901		In the early part of the century, two-revolution machines such as the Miehle are introduced to aid process colour printing.		In the 1901/02 <i>Penrose Annual</i> , the Penrose traveller Frank Middows contributes the article 'Process Work at the Antipodes', and mentioned that 3-colour work is moving ahead in these colonies.
1902		Arthur Traube and Adolf Miethe discover ethyl red as a sensitizer for red light.	The Wellington Typographical Union votes to investigate forming a federation of the allied printing trades.	In December 1902, Frederick Sears works on improving the stamps for the Postal Department of the Cook Island Group, his last job in the Lithographic Department in Wellington.

1904	Ira Rubel begins work on the development of offset presses and develops partnerships in both Britain and America.			In the decade before World War I, N.Z. printmakers are Richard Wallwork and Flora Scales, with A.J. Rae of Timaru possibly the first to produce mezzotints in the country.
1905		In England, Karel Klic makes the first three-colour gravure print. In London around this time Frederick Sears meets Ira Rubel, who develops a press for rubber blanket offset printing using Sears' process for colour printing.	C.G. Zander patents an experimental four-colour process in England.	
1906	George Mann takes out a patent for his offset machine, the first designed in Britain.	The Rembrandt Intaglio Company makes the first reproductive colour prints in long runs from the photogravure process. Panchromatic plates are available commercially.		At least by 1906 four colour processes are in evidence New Zealand.
1908		First attempts are made at colour rotogravure.	The ink-making firm of Morrison and Morrison is established in Christchurch.	Frederick Sears writes 'Alzinography: Lithography of the Future' for the <i>Penrose Annual</i> in 1908/09. He includes discussion of future lithographic colour printing processes.
1909		Both the Rembrandt Company of Lancaster, and the Van Dyck Gravure Company of New York are able to successfully print colour photogravures on a rotary press, at a speed of several thousands per hour from separate plates. The earliest colour print produced in Britain by offset lithography by George Mann & Co. appears in the <i>Penrose Annual</i> of 1909/10.		
1910				In New Zealand process and lithographic techniques are being used side by side for colour printing, and many combination processes are beginning to appear.
1911	The English newspaper the <i>Southern Standard</i> is the first to print illustrations via rotogravure.		The book-binders and printers' machinists amalgamate in Christchurch.	
1912			The Dunedin Printers' Machinists, Bookbinders, Paper-rulers and Lithographers' Union is formed.	
1913			The first offset press is imported into New Zealand by Wilson & Horton Ltd.	
1914			Offset printing commences at Wilson & Horton: used for jobbing printing. L.&M. Miehle machines are brought into New Zealand by Wilson & Horton in Auckland.	

**COLOUR PRINTING IN BRITAIN:
PRINTERS AND PROCESSES**

The Socio-economic Background and British Colour Print Culture: Early 19th Century

Economic Influences

The nineteenth century was a period of great change. As far back as 1709 the seeds had been sown for far-reaching revision in the way that work was done when Abraham Darby first used coke instead of charcoal to smelt iron at Coalbrookdale in Shropshire, a breakthrough that eventually led to iron becoming the master material.¹ Initially in England where there were ample supplies of coal, but then in other countries, iron and later steel became the mainstay of the industrial revolution, and were used for a great variety of products, leading to the widespread replacement of hand tools by machines and then by power tools. In 1769, James Watt had obtained his patent for a steam engine, and as a consequence, industrial production had been increasing from the 1770s onwards, so that by the nineteenth century larger scale factories were supplanting small workplaces. All this resulted in social and economic reorganisation, as well as in the expansion of trade and industry which was facilitated by the development of new means of transport to shift goods and people. This was the age of the coming of the railways, canal systems and better roads, all of which facilitated the distribution of all kinds of goods including books and other printed matter.

Political Influences

Towards the end of the eighteenth century had come the American War of Independence and a little later the French revolution, with the storming of the Bastille in 1789. These events ushered in a new social order of liberty and equality, the liberalisation of law, and the beginning of a more democratic era. There was greater general interest in politics and public affairs, while rapidly increasing population together with greater expectations from life in general, led to a demand for the production of material wealth. An increasing ability to supply more material goods began to satisfy this demand but increasing expectations were at the same time stimulating the production of a greater variety of products. In the last decades of the eighteenth century Cook had made his voyages, and there had been coastal exploration of both Australia and New Zealand. In 1788 the First Fleet of convict ships had arrived at Botany Bay. People were looking beyond their own shores, and influences were wider than ever before.

Social and Intellectual Influences

In Britain the beginnings of a new social climate arose during the nineteenth century, and this began to lead to a general striving for betterment among the middle classes as the rising working classes overtook the old social orders.² Part of this was the thirst for knowledge as well as the wish for better pay and more entertainment. There was a gradual rise in the demand for education, and an interest in learning of all kinds. A growing interest in drawing and watercolour painting as pastimes was fostering skill in observation and image-making. The appearance of the early precursors to the camera "undoubtedly created an interest in things seen and led to a concern with vision and the nature of representation."³ The acquisition of 'useful' knowledge was particularly sought as literacy increased, and the influence of social reformers played its part, for instance, that of Samuel Smiles whose nineteenth century works on moral improvement were being absorbed. The propagation of morality was encouraged and Sunday schools came into being. The ideas of the eighteenth century philosopher Kant had stimulated reasoning, discussion and questioning, and an attendant thirst for factual knowledge and the need for encyclopaedic sources was ongoing. At the same time, scientific discovery was growing, often as the result of expeditions, and, importantly, professionalism in scholarship and scientific method was developing. Consequently scientific publication was increasing, especially in areas such as natural history and topography, where illustration lent itself to the enhancement of the communication of discoveries. Scholarly, technical and scientific circles began also to require greater flexibility for reporting in printed form, with the guarantee of verisimilitude becoming of more concern.

Impingement of Background Influences on the Printing Trade, Especially Colour Printing

These developments stimulated the printing trade and sparked new efforts to diversify the printers' business in the nineteenth century and beyond. Although stamp duty impacted on any large scale dissemination of newspapers, the reading public began to buy more newspapers, periodicals and books, including novels, as well as children's books. Industry itself needed more print materials that also incorporated graphic representation, such as plans, maps, technical drawings and diagrams, while businesses were requiring more printed materials such as forms and letter-heads. The rise of government record keeping, and of public institutions, bodies and corporations also led to an increased need for printed documents, as well as for ephemera of many kinds, including posters, timetables, calendars, and cards. New approaches to design were generally needed, but as Michael Twyman has pointed out, after 1800 it was in the areas of periodical and jobbing printing, where work volumes were increasing and diversifying that, as printers grappled with the new, most

originality was seen. This is the aspect, he said, "which distinguishes the nineteenth century printer from his eighteenth century counterpart and leads to the new profession of graphic design in the twentieth century."⁴

The confluence of a wide variety of diverse factors each exerting a particular influence caused changes in the printing industry, many of which were permanent. These changes caused a shift in which the old order was in many ways superseded and a new equilibrium was eventually established. This was to be the century that would see change in almost every sphere of the industry, including changes in machinery, materials, processes, products, in relationships between workers, and in the market. Specialisation was becoming necessary, as printing proliferated, and branched into more distinctive areas. For example, copperplate printing was now usually undertaken by specialist firms, particularly in the larger centres, where printing establishments were increasing in size from the hitherto smaller printeries. One of the significant advances in nineteenth century printing was the achievement of viable commercial colour printing processes which resulted in the appearance of printed colour in many forms never before experienced, and the beginnings of colour for the mass market. This was the century of the emergence of the graphic book,⁵ and part of this was the demand for colour.

Although there had always been a market for printed colour, because of inherent problems in producing it economically, up until the nineteenth century printers generally had been forced to take recourse to manual methods for the addition of this element, especially for relatively expensive books, but also sometimes for items such as cheap broadsheets. This had led to the development of a hand-colouring tradition, in which the labour of low-paid women had typically been used. Although the employment of women on low wages had sometimes allowed the appearance of colour at the cheap broadsheet end of the spectrum, for the ordinary reader the experience of colour in printed books had been largely denied. For most people, the pleasure of colour, which had been part and parcel of the medieval manuscript long ago enjoyed, if only by the few, until the nineteenth century was still practically unknown to the many. Instead the daily experience of the printed book had been in the main a plain diet of black and white, and because colour had not been usual it was not expected.

By the beginning of the nineteenth century, this position had already begun to change. Education in a taste for printed colour had gathered pace in the eighteenth century as new graphic means had made coloured prints more affordable to the common man, and this was

also linked with a popularisation of technical manuals. High enough standards of colour printing had already been achieved by several methods to make prints acceptable substitutes for original paintings. In the latter part of the century, printers had also used an element of colour as a business ploy, as they realised the power of colour, when used in advertising, to assist in widening the circulation of periodical literature to entirely new clients. The poor man's colour had up until then been available in the limited form of ballad sheets or 'penny plain, twopence coloured' prints.⁶ Until the technical advances of the nineteenth century, most of the colour printing processes had proven to be both laborious and prohibitively expensive, so that where colouring for the enhancement of printed materials was desired, it was often for economic reasons that its addition was made by hand. Pressure was there to develop cheaper colour printing methods for the emerging mass market, but at the same time to continue the high standards and favourable results being achieved by print processes such as aquatint, which was being used for much of the higher quality colour work of the time.

Early Influential Inventors and Innovators in the Old World

It was Gutenberg's fifteenth century invention at Mainz that, precipitating a rapid change, led to the first printing revolution, so that particularly text, principally printed with black ink on white paper, could be printed and disseminated to a much wider market than had hitherto been possible. In 1457, it was Fust & Schöffer who carried out the first two-colour printing, of the famous letter "B" for the *Psalterium cum Canticis*, also at Mainz. (See plate 3.) It is worth remembering that Gutenberg's printing experiments date from around 1440, so it had been only a few years later that colour printing in more than one colour other than black had been attempted. At this stage, printing in one other colour, usually red, perhaps to pick out important parts of a text, was a simpler way in which to use the element of colour.

In the pre-Gutenberg manuscript era, colour illustration had featured strongly, a fact that serves to underline that the element of colour was an everyday presence for those privileged to have access to books. Although the model for the early western printed book was the manuscript and the associated hand-colouring tradition was the inspiration for, and therefore the precursor to colour printing, after the tour de force of Fust & Schöffer, it was during the period of the appearance of the printed western book that, perversely, colour in fact largely disappeared. The evolution of colour printing was not to mirror the Gutenberg revolution that had occurred for text.

However, the desire for colour had not disappeared, but largely because of uneconomic processes and technical difficulties encountered by printers who attempted to print in

colours, up until the nineteenth century colour printing had largely evolved as an art process necessitating much time and manual work, especially to achieve the representation of tonal values. In this environment, when colour was required, most often it had continued to be manually added. It was to be only after the long slow development of the graphic arts that nineteenth century industrial changes at length allowed commercial colour printing to serve the mass market, eventually ousting hand-colouring, although in some instances the tradition of hand-colouring persisted into the twentieth century.⁷ Before colour printing for the mass market could occur, much experimentation leading to the linking of such developments as photography and colour theory had been required.

Much of the slow development of graphic printing had been due in part to the more complicated processes needed to represent the visual quality of tonal contrast which was an important and basic element of many images, necessary especially for reproductive colour printing. A continuing market demand for reproductions of the paintings of the 'old masters' had been a major reason for the sustained effort over the centuries to develop and improve such processes in Europe.

Antecedents

The seeds for some of the colour printing processes as we know them today were sown in the eighteenth century and further back. In retrospect it can be seen that processes tried then were the germ from which later processes evolved. The development of the viable colour printing processes of the future, especially those to be used for quality colour reproduction of artwork, in turn depended on these. The birth of one early eighteenth century colour process was first brought about by fruitful interaction of knowledge and ideas from separate fields of study. It had been an individual of genius who led the way to new knowledge, that, when combined with existing practice, enabled a breakthrough of significance in the field of colour printing to be made. In 1672 Sir Isaac Newton had communicated to the Royal Society an important discovery that he had made in the field of physics. By experiment, he had shown that white light contains all the wavelengths within the visible spectrum, and that when a beam of white light passes through a prism, refraction causes it to be dispersed into its component electro-magnetic chromatic wavelengths. Newton had also shown that these components could be recombined to form white light again. After this research, there were thought to be seven basic colours, although later the conventional view was that, in an additive system, there are three primary colours, representing the red, blue and green wavelengths, from which any other colour in the visible spectrum, including white light itself, can be mixed or matched.⁸

Also early in the eighteenth century, it had been the Frenchman James C. Le Blon who had applied Newton's principles "to the representation of colour by the processes of art."⁹ In so doing, Le Blon had invented an early three-colour separation process that allowed all colours to be printed by subtractive superimposition of the three primary colours, red, blue and yellow. Le Blon used a method of engraving in tone known as mezzotint, which was largely used for the monochromatic reproduction of prints after paintings.¹⁰ It was the grain produced by mezzotint that allowed for the representation of a great variety of middle tones. This process had been first invented in Amsterdam in the mid-seventeenth century by Ludwig von Siegen, whose first dated mezzotint print was made in 1642. The early procedure, used mainly for portraiture, was to work from light to dark, roughening parts of the copper plate to hold more ink where darker tones were required. Later, this procedure was reversed, so that the mezzotint process became one in which the whole copper plate was first roughened with a rocking tool in degrees according to whether lighter or darker tones were to be produced. For the light tones, the burr was scraped away, so that where the plate was smoother, less ink would adhere, creating lighter tones. Thus the process became one of working from darker to lighter, "and is characterised by soft and hazy gradations of tone and richness in the dark areas."¹¹

Le Blon invented his trichromatic colour printing process expressly to reproduce the artworks of the masters, and so his process was not applied to illustrative work for books. The essence of this process was described in the treatise of 1722, *Coloritto, or the Harmony of Colouring in Painting*. Briefly, the method consisted of first analysing the colour scheme of the picture to be copied, then preparing the colour plates using the mezzotint process, one for each colour, and finally printing in the order blue, yellow then red. The process relied on the three impressions following one another in succession, so that the required colours resulted from the blending of the inks while still damp. It was this blending of colours which was key to the process but also the reason that it was expensive, and mezzotint was not robust enough for many impressions. Each print required all three impressions to be taken before the next print could be commenced, and because of this the efficiency of long runs in each colour could not be achieved. Also, special inks were required: the colours "had to be transparent enough to show through one another, in order that the proper blending of tints might be obtained."¹² In 1704 Le Blon's first specimen prints had come off the press. The requirement for three passes through the press also raised the problem of obtaining exact register, one of a range of the technical problems for which solutions needed to be found before colour printing could become a reliable and cost-effective process.

Other intaglio methods of colour printing had been successively tried, although many, such as mezzotint, stipple engraving and aquatint, involved processes that were unsuitable for large editions. For instance, the richness of a mezzotint print depended on the burr raised by the rocker, but because this feature did not wear well in the press, it was more suited to the production of prints than for long run book illustration. In England, aquatints were printed from an intaglio process that had been developed in the eighteen sixties in France and later introduced, becoming popular in the early part of the nineteenth century. Rudolph Ackermann, the German artist and publisher who had come to London in 1795 at the time the Napoleonic wars had prevented imports of plate and prints from the continent, gained a reputation for excellence in aquatint. This process, by which the appearance of watercolour could be simulated, continued a popular style. Although early aquatints had often had more than one colour added from the press by means of separate plates, in England, many had been printed from a single plate in the manner of stipple engravings or mezzotints. By the years approaching the period under study, the process of aquatint often consisted of one printed colour only, but with additional colours added manually.¹³ After 1825, aquatint had declined, gradually giving way to the newer processes, especially the lithographic colour processes discussed below.

Preparing the Way for 19th Image Printing

Printing Surfaces: New and Modified Processes

Thomas Bewick and Wood Engraving

During the course of the eighteenth century, much book illustration in England had been executed by immigrants rather than by locally-born artists, but by the end of the century, “there was at last an eminent English illustrator, Thomas Bewick of Newcastle.”¹⁴ Bewick was attracted to the art of wood engraving during the time that he worked as an apprentice to Beilby, a metal engraver. Being of an innovative bent, he enjoyed trying new ways of doing things, and succeeded in making two technical break-throughs that were to again bring to the fore the age-old medium of wood as the material to facilitate an important graphic technique. This new approach would also form a basis for colour printing of the future, but not yet.

Instead of engraving on the plank face, Bewick began to engrave on the end of the plank, where the wood did not splinter as easily. As well, he devised a system of white line cross hatching for rendering fine detail, thus being able “to achieve perhaps the best results of any wood engraver.”¹⁵ Bewick’s relief technique proved more robust, and allowed more freedom in the basic drawing, because the non-print parts of the wood could be more easily cut away, facilitating the achievement of more subtle tone effects. A lowering of the block

where mid-tones were desired meant that printing was not as dark in these areas,¹⁶ so enabling a greater variety of tonal values to be employed in the illustration. The perfecting of this technique enabled Bewick to become a prolific engraver, and because a relief technique was an ideal press partner for text, wood engraving began to see a revival for book illustration across the whole spectrum, the size of the boxwood being the only limiting factor. Sections of boxwood were sometimes pegged together in the attempt to overcome this problem. The use of wood engraving continued throughout the nineteenth century, declining only with the introduction of photomechanical techniques in the 1880s.¹⁷

Because wood engraving afforded an economic means for printing good quality illustrations, the new technique both stimulated and fed an increasing demand for graphics in books, which over the next decades were to increase in quantity and variety for many diverse reasons. Bewick himself had a great interest in natural history, and accordingly, some of his best illustrative work was for natural history titles such as the well-known 1790 *A History of Quadrupeds*, and also for the famous *A History of British Birds*, which came out in two volumes in 1797 and 1804 respectively. J.M. MacRobert has said that because he was "a master of the miniature... he is admired most of all for the vivid pictorial tail-pieces, sometimes rough in subject, though graceful enough in execution, which he added, not to illustrate the text, but to express his own pithy, didactic outlook."¹⁸ Colin Clair has pointed out that thin black-line illustration drawn by an artist, but not cut on the block by the artist, began commonly to replace the white line engraving of Bewick, often for periodical illustration¹⁹ because it also possessed the virtue of the ability to be printed at the same time as the text. To produce a woodcut of this variety, the engraver merely followed a drawn line, and consequently the art of Bewick gradually degenerated into a trade.

Alois Senefelder and Lithography

Also preparing the way for the next century, and also the result of a technical innovation from an inventive individual, although this time in Germany, was the breakthrough for printing that would later form the basis for important colour printing processes. From 1796, Alois Senefelder had begun experimenting with engraving on stone, and by 1798 he and his musician partner were experimenting with a chemical method to produce a sharp impression, the beginnings of the process which was to become true lithography. They first wrote in mirror image on Solnhöfen limestone with greasy ink, after which the parts of the surface free from writing were etched away with nitric acid to leave the inked portions standing in relief by about two millimetres, enabling an impression to be taken in the press. From these beginnings the process was gradually improved to become the planographic

process of lithography, which was to provide a totally new option for producing the printed page, whether textual or graphic, although the two were printed separately. The new alternative existed side by side with intaglio and wood engraving. Essentially lithography became a process in which a design was drawn in greasy or soapy chalk onto a stone to which water was then applied. The grease repelled the water, so that only the non-design parts of the stone were wetted. When printer's ink was applied to the stone, the moistened parts of the stone repelled the ink, while the design took it up, enabling it to be reproduced on a suitable substrate as the impression when passed through the press. An 1897 issue of the *Inland Printer* reported that the essence of the process involved a chemical change, explaining more exactly that in drawing or transferring an image to the stone, "it is principally the soap which undergoes through the etching a chemical change" so that

a new substance called sebacic lime is produced. This then forms the printing face, and the change is distinctly visible. After washing off all the ink, these places will appear lighter, but are considerably harder in texture than the stone...

Further, the potential suitability of a variety of substrates for lithography was mentioned, and the necessity of etching was made clear:

The transfer embodies the real principle of lithography for every sort of stone or metal, provided it does not possess a high state of glassy polish or extreme condensation of texture; possesses the quality of absorbing grease as well as water, and allowing these to penetrate more or less below its surface. Where the water has lodged, the grease finds no hold, and vice versa; but to make a practical printing plate of stone or metal suitable for long runs, a third chemical principle is called in—etching. An inorganic acid, as nitric, sulphuric, muriatic, phosphoric, fluoric, etc. in combination with an organic product, as gum arabic, fills the bill. The ink and crayons for drawing and transferring to stone, etc., are composed mainly of soap, tallow, wax, resin, and lamp-black (the latter for no other purpose than to gauge the degree of strength of the former); by a very high temperature these substances are fused completely. This is what Senefelder discovered in 1798.²⁰

This revolutionary idea was to become the basis for the development of many more efficient printing processes of the future, including new and more successful ways of allowing the colour dimension in print to exert a greater influence on everyman. The nineteenth century was to be the century when graphic techniques, as well as entirely new processes and machines were to take centre stage in the world of printing and publishing, and colour printing was at last to be developed to fulfil the needs of the mass market. The nineteenth century proved to be the century in which colour printing's time had come. Almost simultaneously, several experiments were being made which would provide solutions to the old problem of how to successfully add the element of printed colour to the graphic image, and further, efficiently enough to be viable for the long runs required to satisfy a mass market. The optical behaviour of colour itself is also relevant, and it was the French chemist M.E. Chevreul who increased understanding of this aspect as he studied the science of colour between 1828 and 1864.

Equipment to Underpin Colour Printing: 19th Century Inventors and Improvers *Stereotyping, Electrotyping and Siderography*

An invention which was to be of particular benefit to illustrative work, especially where larger editions were required or wood blocks were to be used was that of the process of stereotyping. The invention had first been made by William Ged in Edinburgh in 1739, and although little used at the time, was later revived by Firmin Didot. Ged had taken casts of composed type in the forme in plaster of paris, so that instead of having to reset type if another edition was needed, the plate could be reproduced from the mould. Firmin used a similar but reverse process "by making the metal cast from sunk faces, thus halving the work of reproduction."²¹ In 1804, the secret was bought by Cambridge University and then converted to a commercial process by Stanhope in 1805. Stereotyping possessed the advantage that the original plate could be preserved, and also the advantage that multiple copies of the forme could be made so that several could be printed at one time if needed for fast and efficient production of large editions. By 1829, lighter paper mâché had replaced the heavier materials for the matrices, this material paving the way for taking from the formes the moulds or flongs from which curved plates could then be cast. Later, in 1839, another important advance occurred: the electrotpe was invented. The latter was to have not only the advantage of enabling its use for finer half tone screen work, but also was not subject to unwanted shrinkage, especially important for colour work, where good register is essential. Another invention which increased the durability of plates was made by the American, Jacob Perkins, who developed siderography, an electrolytic process which added a hardened steel face to copper plates to increase their durability, thus facilitating long runs and enabling finer engraving to be done. Some of the first publications to benefit from this improvement were the drawing room annuals that were fashionable in the 1820s. In the thirties Johannot is well-known for his steel engraved book illustration, for example his "darkly romantic steel engravings"²² which illustrated Hugo's *Notre Dame* of 1836.

Press Improvements and Colour Printing

The first decade of the nineteenth century immediately brought inventions that were to change the printing industry forever, opening up entirely new possibilities. In 1800 Lord Stanhope's invention, the all-iron lever press was tested in the Bulmer printing office in England. That the time was right at the end of the eighteenth century for such radical changes in printing press construction was, according to James Moran (*Literature Review*: 17), for two reasons. One was the great advance in techniques for the casting of metal, and the other was the appearance of the class of mechanics who were "the fore-runners of the engineers, [and] who were to transform the nineteenth century industrial scene" by making

possible the incremental improvement to printing machinery that occurred.²³ In the latter area, almost overnight letterpress production ability doubled because of the introduction of the iron machinery, both through its greater strength and "the more ingenious method of applying pressure."²⁴ In the arena of commercial production such improvements heralded the close of the era of the wooden hand press.

Another important invention in the same decade was that of the steam-run cylinder press that was built by the German printer Freidrich Koenig who had settled in London. By 1814 the *Times* became the first newspaper to be printed on a power cylinder machine. It was for newspaper production in particular that the efficiency of the faster printing of large runs enabled by this press was to be of huge economic benefit almost immediately; this development was said to be "the greatest improvement connected with printing since the discovery of the art itself."²⁵ For the newspaper market especially, the capture of an increasingly wide circulation and larger readership and was to become crucial. The Koenig press, by enabling the printing of 1100 sheets per hour, lowered costs by 25%, whereas the output of the hand press had been only about 300 sheets per hour.

The advent of cylinder machines opened up new possibilities for colour printing processes that in the era of the hand press had been slow. The cylinder machines speeded up the process by allowing two single colour printing units to be coupled together, with an intermediate cylinder carrying the sheet of paper between the two printing cylinders to more rapidly achieve two successive impressions.²⁶ Devices to facilitate quick drying were then developed: at first gas jets and then electric heaters.

Later in the century the invention of the rotary press in 1848, and in 1868 the introduction of the rotary web-fed machines enabled production to be increased to 20,000 sheets per hour. Faster printing enabled newer processes such as lithography to become more economic for longer runs, and as this branch of printing developed, special lithographic presses were invented. Other iron presses that followed the Stanhope were the Columbian, which was first introduced by George Clymer in 1816 in Philadelphia and which reached Europe in 1817, and the Albion, introduced by R.W. Cope in the early twenties. This was a press later used by William Morris. These presses, which replaced the jobbing presses of the time, were themselves replaced by the American Cropper machines in mid century. Later, such technological improvements paved the way for printers to introduce colour more successfully to the mass market, and further innovations were built on these to eventually allow colour to be employed in large circulation publications such as the daily newspaper.

In 1861, the British firm of Waterlow bought a two-colour machine designed by Conisbee. This press is considered by James Moran to have been the first really successful two-colour machine. It had two independently acting sets of inking devices, with the central cylinder making two continuous revolutions to give an impression for each colour. Conisbee's design allowed for a perforated gaspipe under each end to allow heating of the ink tables to facilitate the distribution of coloured inks in an even fashion. Others to invent single-cylinder two-colour machines were Harrild and Payne and Dawson. The latter firm modified a Wharfedale, the original two-revolution or stop cylinder machine that had been available since 1858,²⁷ to produce the largest machine to have been built up to that time.

The introduction of two-cylinder machines in the 1880s by the Massachusetts manufacturing firm of Huber and Hodgman was a factor that was to facilitate colour printing. This type of machinery required the introduction of feeding devices, or manual arrangements to allow the sheet to receive several impressions in different colours from different formes in succession. Much of the specialised colour printing knowledge became secret, the details of the preparation of cylinders and press often being closely held. Many different procedures, labour-saving devices and extensions to the basic machinery were tried in the effort to automate single-sheet printing in the last part of the nineteenth century. Typically "the sheet was fed on to the first cylinder to receive the impression from the first forme, and was taken by grippers to the second cylinder and carried up between the two cylinders and the bed again, where it received an impression from the second forme."²⁸ It was not until the closing years of the century, in 1897, that an efficient automatic paper sheet feeder was invented in America by Dexter. This device took a sheet at a time from the pile and fed them successively and evenly down the feedboard to be printed.

Paper, An Essential Requisite: The Fourdrinier Brothers

Other considerations, beside the question of suitable presses and processes were those of other essential materials such as paper and ink. Until the eighteenth century's end, paper had been made by hand, and was used damp in the press, something which contributed to registration difficulties because of the shrinkage that could occur if uniform dampness was not maintained. The problem of obtaining paper in quantities to match the new production levels of the industrial age was solved by the mechanisation of paper making, pioneered by Henry and Sealy Fourdrinier and others in the first decade of the century. After the first pioneering attempts in France, the introduction of the first practical paper making machine occurred in 1803, and after this, paper output increased tenfold,²⁹ cost decreased, and continuous as opposed to single sheet paper could be manufactured. By 1840 in Germany

and in Britain by the fifties wood pulp was beginning to be used for paper manufacture, and later esparto grass, the two materials which were to replace rags as the major components of paper.³⁰ Art paper, coated with china clay to provide various grades of smoothness, first introduced in the 1830s, was especially beneficial to colour printing.³¹ The problem of obtaining perfect registration was ongoing and various solutions were tried. From the eighteen seventies onwards printing on damp paper was able to be discontinued and this eliminated the inherent shrinkage problem. New graphic processes were rapidly increasing during the nineteenth century, and even by 1859 William Stannard's *The Art Exemplar* listed 156 separate methods for printing images.³² Many improvements in the manufacture of paper were needed, for example, to allow "the fine lines and small areas of rich black" that were characteristic of the now widely used wood engraving technique pioneered by Bewick to be accurately printed.³³

The Question of Ink: William Savage and George Baxter

In the past, the inks used in the printing industry for hand colouring had been water-based, often to achieve the effect in reproduction of a watercolour painting. On the other hand, inks for printing in colours usually had been oil-based, a factor which, in the past, had not been entirely satisfactory due to the frequent occurrence of the oil staining the paper. Until the 1840s letterpress printing was almost entirely monochrome. Michael Twyman has postulated that the introduction of colour into jobbing printing, for instance into poster work, was delayed because of the lack of reliable coloured printing inks. This was being noticed as far back as 1841—in his *Treatise on Printing* of that year Hansard had pointed out that "while colour printing was frequently used for pictorial work connected with the fine arts it had been entirely neglected in run-of-the-mill printing."³⁴

By around the middle of the century experimentation into the manufacture of coloured ink, a material that is crucial to the colour printer, had advanced enough to allow the supply of coloured inks that were more suited to the purpose, and after this colour printing developed very rapidly. Until the eighteenth century natural colorants had been in use, but early artificial colours were introduced after this time, the first being prussian blue, synthesized by Diesbach in 1704. This was followed by cobalt blue, although not until 1802, and chrome yellow was introduced soon after in 1809. However, it was not until the significant discovery of aniline purple, the first synthetic coal-tar dyestuff, by the English chemist William Perkin in 1856 that the ground was laid for the development of synthetic dyes and the subsequent foundation of the aniline dye industry. In 1869 alizarin had been discovered and in 1878, indigo. Over the next hundred years, more than four million coal-tar dyes were

manufactured, providing the bulk of the commercially made colorants for the painter, dyer and printer alike.³⁵

William Savage had been one of the early nineteenth century pioneers in the field of colour printing who worked on the ink problem. Although the printing processes he used did not turn out to be commercially successful, his ink experimentation, especially concerning the production of superior coloured inks, dating from the time he set up in business in London in 1803, was important to progress in that area. The key to Savage's printing inks was the use of copaiba balsam as the base, an ingredient which not only prevented oil staining but also enhanced the performance and permanence of the colours themselves. Savage's opinions on the subject of the theory and use of coloured inks for printing were demonstrated in the subscription publication *Practical Hints on Decorative Printing* which was completed in 1823, as well as in his *Preparations in Printing Ink in Various Colours* of 1832.³⁶ The medium used by Savage was wood engraving: because wood-block printing was relatively cheap this was compatible with the aim of finding a colour process suited to commercial printing. Savage used the new iron Ruthven hand press for his printing. Engraving for *Practical Hints* was done by well-known engravers of the time, and the colours used for the relief printing were brighter than those used in former chiaroscuro methods. The treatise features specimen sheets of his coloured inks and a series of plates demonstrating the successive stages of his process was included, the overall results being considered praiseworthy by Ruari McLean for the technical virtuosity of the plates rather than for aesthetic achievement. For the printing of the plate, 'Ode to Mercy', as many as twenty-nine blocks were used, although McLean has considered them lacking the richness of colour that would be expected from so many workings.³⁷ On the whole, plates made from only three or four colours were more successful, if variable, but R.M. Burch (*Literature Review*: 11) reported that Savage's reproduction of the famous Mainz Psalter initial was ugly. It appears that Savage's method was to complete the run for each colour block, with the sheets being kept damp until the next colour was printed from a subsequent block. Twyman has summed up this work, saying that "Savage's major contribution was to refine and extend the basic technique used by John Baptist Jackson in the eighteenth century."³⁸

Savage's second treatise was a more detailed account of his work, containing recipes for his inks, but although it was to have been expected that communication of his knowledge would have enabled the propagation of his ideas, this did not happen. It is thought that the recipes may have been unreliable: they were considered to have been 'incorrect' by the compiler of the *Reports of the Juries* of the Great Exhibition of 1851.³⁹ Savage's *A Dictionary of the Art*

of Printing, his final publication, is still seen as a useful reference work, for example for its account of the then new process of electrotyping, although it is not particularly informative on the subject of colour printing. That Savage's methods did not in the end lead to a viable commercial process for colour printing was due partly to the fact that the essence of his method required the printing of a wide range of colours in the effort to reproduce the colour of an original, and was in itself in the manner of an art process. Such a method, expensive of time, was not suited to mass production, the general direction in which nineteenth century printing was heading. However, Savage's valuable experimental work on types, presses and inks, especially on coloured inks, had helped to break ground that others would develop further. Almost simultaneously, several experiments were being made which would provide solutions to the old problem of how to successfully add the element of printed colour to the graphic image, but at the same time, efficiently enough to be viable for the long runs required to satisfy a mass market.

Another early nineteenth century colour printer to work on the question of ink was George Baxter, one of whose achievements was the improvement of oil-based inks, whereby he was enabled to achieve brilliant permanent colours. Baxter's processes involved a mixed approach, and because he worked both from wood and metal he would have needed a variety of inks, including water-based inks, to suit a variety of purposes.

19th Century Colour Printing Processes

George Baxter

It was George Baxter (1804-1867), son of a Sussex printer, who was the first to find a successful colour printing method based on the optical fusion principle, and who showed that the final step of in the process of image production, that of adding the colour, could be successfully mechanised. Consequently he had pointed the way for colour printing to be eventually taken into the commercial sphere, enabling hand colouring to no longer be the only option if colour was required. Baxter had been trained in many of the art techniques that were pioneered in bygone centuries, enabling him to base his 'new' process, which came to be known as 'Baxtertype' or chromoxylography, on these. Baxter, "an artist to his finger tips,"⁴⁰ used a mixed process in which he employed both the older intaglio and the newer lithographic methods in conjunction with relief techniques. Baxter himself referred to the process as 'Polychromatic' printing. Instead of using wood for the key block, Baxter substituted metal—either copper, steel or zinc, which had been prepared by using tone-producing processes such as mezzotint or aquatint. Occasionally he used a lithographic stone as the key, with tiny marks to indicate the colour boundaries. Impressions were made

on wood blocks (or metal), one for each colour used, and these were separately engraved. The first impression, which resulted in a complete intaglio print, saleable in itself, was taken in monochrome, usually in a neutral colour such as grey or terracotta and the rest of the colour was successively added from the blocks, requiring from ten to twenty printings but occasionally thirty.⁴¹ Rather than making an entirely new discovery, however, Baxter was updating and furthering a process that had been pioneered earlier by others, including Kirkall and Pond in the eighteenth century. His biographer, C.T. Courtney Lewis has said:

It is perfectly plain, however, that he was no copyist, but an inventor of genius. He had to do as Jackson had done, and recover a lost art, and to wander, as Savage had wandered, on a long dis-used road. He had to choose his metals, ink, and paper; and his choice of each of these materials involved exceedingly complex considerations...Baxter gave to colour printing the stimulus printing gave to letters; and from his day there could be taken into the homes of the masses, for the first time, for their education and other advantage, imitations of coloured pictures that were artistic and reasonably cheap.⁴²

This had been George Baxter's aim—to develop the means for mechanically reproducing the works of the masters in a creditably artistic but cost-effective way. Baxter patented his process in 1835, the terms giving him a monopoly that consequently prevented others from printing in a similar manner until the patent expired in 1849.⁴³ Although George Baxter had trained apprentices, he was reluctant to grant licenses to others wanting to set up a similar business. However, in 1849 he was able to extend his patent for the colour print process for another five years, but business difficulty eventually forced his hand, and in the end, at the suggestion of the court he granted licenses to others for a fee. The result was that about six English firms acquired the right to practise colour printing by the Baxter process, including J. Dickes, Le Blond & Co., the London firms of Myers and J.M. Kronheim, and Bradshaw & Blacklock in Manchester.⁴⁴ This was a factor which held back the spread of his colour printing process for a time. Baxter himself had retired from the business by 1860, and although these firms continued to supply prints to the market and altered the process, many of them were not able to come up to Baxter's standard. This doubtless contributed to the fact that much of the mid nineteenth century colour printing was thought to be, although expensive, of a low standard. For nineteen years Baxter had effectively controlled the process, although as Courtney Lewis pointed out, by the time the patent expired in the mid fifties, "chromo-lithography had so far advanced as almost to have taken the place of block and metal printing, and there was no prospect of material advantage in others using Baxter's or any similar processes."⁴⁵

The attention Baxter paid to quality inks, together with his techniques for key blocks, and the number of impressions that were necessary to build up the final print, did give his prints, in Ruari McLean's opinion, "the richness that none of his rivals ever attained and which still

amazes us today.”⁴⁶ Among Baxter’s subjects were images from Australia and New Zealand, and from examination, the detail seen in such prints, for instance in the companion Australian gold-diggings prints ‘Australia. News from Home’ (1853) and ‘News from Australia’ (1854)⁴⁷ the means for obtaining tonal contrasts appears to have been in the nature of a fore-runner to the prepared tones, for instance, the stippling and cross-hatching effects later used by lithographers. By 1857, Baxter had explored the possibility of machine ruling of surfaces, heralding a move towards a method to produce halftones mechanically, and by 1859, Baxter had also taken out a patent for colouring photographs by his process, although no actual pictures were produced. (See also chapter 11.) The high quality of Baxter’s colour work was also a product of the fact that Baxter carried out most of the work himself, grinding his own inks, making his own drawings, engraving the plates and doing the presswork.

At the time George Baxter had invented his Polychromatic printing, the field of colour printing was wide open in England, and Baxter had been able to fill a market niche by producing colour reproductions of art works entirely from the press. Any apprentices were very closely supervised, as were the boys who pulled the prints using the old-style platen press, where four points on the platen were used to obtain accurate register.⁴⁸ Baxter’s high standards meant that his process was relatively expensive, and this had contributed to his difficulty of surviving in business when the market was very competitive, when the growing need was for inexpensive printing for the mass market. Geoffrey Wakeman has noted that it was not until after the Great Exhibition of 1851, at which the Baxter stand had received an honourable mention, that colour printing in relief really began to come into its own.⁴⁹

Baxter’s achievements had been many. He had raised interest in colour printing to the extent that it was becoming more popular, and this had stimulated the exploration of a variety of processes to meet the growing demand, so that cheaper colour printing was on the way. After Baxter’s death in 1867, a cult arose, bewailing a lost art, although in fact many plates remained, some still being in the hands of Bramah of Sheffield into the twentieth century. In the latter part of the nineteenth century, some of the men who had worked for Baxter or had taken out a license from him carried on as colour printers, often using their own processes as well, for example, Dickes, Kronheim and Leighton. Kronheim, who modified the Baxter process, had the most prolific output. Having found that wood was likely to warp, he used copper and zinc plates throughout, preparing the key plate using stipple, line engraving and some aquatint. The colour was applied from relief plates, a typical ten colour job consisting of the application of yellow, two flesh tints, two blues, three reds, and a brown on top of the

black key. R.M. Burch reported that in the Kronheim printery “thirty or forty platen presses and the same number of copperplate [presses] were used, and about 1,800 pulls was considered a very good day’s work.”⁵⁰ This firm continued until 1878, producing both separate prints and book illustrations by the improved Baxter process.

The colour printing firm known as Gregory, Collins & Reynolds had originated from Baxter’s own workshop, both Gregory and Reynolds having completed apprenticeships there. This firm specialised in colour title pages and cheap books, especially children’s books, and had also diversified into textile printing. Advances in the latter field had been made in France in the late eighteenth century, where the colours were printed from successive plates, and also in Germany where a process using engraved copperplates was succeeded by one using engraved cylinders until the business closed in 1843. Until Leighton joined the firm of Gregory, Collins & Reynolds around 1847 the colour book-work had been mediocre, but Leighton’s expertise in using a modified Baxter process had seen standards improve. Book covers had been generally better, for instance, those produced for Clarke & Co. in 1845 had included an edition of Jane Austen’s *Pride & Prejudice* for which the lettering and an accompanying floral ornament was printed on a background in solid colour and gold.

Ruari McLean has described the later work from this firm as being of high quality, their best plates being up to the standard of the better known colour printers of the sixties, Edmund Evans and the Dalziels. Their process, employing the use of up to ten colours to print from wood blocks, was similar to that employed by Charles Knight, in that the tint work was followed by the black outline block, although sometimes aquatint plates were used as well as wood blocks. Thus the modification of the Baxter process was to lead on to one of the major colour printing processes of the second half of the nineteenth century, that of colour wood engraving. Michael Twyman has said that for colour relief printing, however, rather than such methods of colour printing, “the approach...which caught on commercially depended much more on the engraving of complex tones on the wood blocks themselves and the subtle optical fusion of juxtaposed tints.”⁵¹

In the new industrial environment of the nineteenth century, the renewed drive to print in colours resulted in scores of new approaches to age-old problems, while improvements in materials coupled with the expertise of the pressmen often enabled a better result, so that the path to viable colour printing for mass production was at last being mapped out. The many nineteenth century colour printing processes that were developed can be seen as falling

largely into three main groups: firstly, relief printing from wood or metal; secondly, lithographic colour processes, and thirdly a mixed process that depended partly on relief and partly on intaglio processes.⁵² The latter, typified by Baxter's process, aimed to combine the advantages of both approaches.

Relief Colour Printing

Towards Cheaper Colour Printing: Charles Knight

Charles Knight, who was working at around the same time as George Baxter, turned his attention to the production of printed colour for the popular market, and to this end his chief priority was for an efficient process to mechanise and speed up colour printing, so achieving a larger output more economically. In 1838 Knight patented the 'Illuminated Printing' method, a relief process in which either metal plates were used alone, or metal plates were used to colour a wood-engraved key. Knight's method, although akin to that of Baxter, was in a sense the opposite, in that the colour was first printed from metal plates and then the black image was added from a wood block last. Knight used a modified Ruthven press, and tried several different rotation methods, described by Burch, for applying several plates successively to a single page in an attempt to efficiently mechanise his colour printing process.⁵³ Each plate bore a separate colour which was printed successively on top of the last while the ink was still wet, with the last to be applied binding the others together. The intended colour mixing resulted in more colours, usually seven to twelve.

In keeping with the experimental tenor of the times, some of the coloured nineteenth century maps were being produced using innovative methods. In 1839, Charles Knight's woodblock process was employed at the Clowes printery to produce his patent illuminated maps, using a revolving apparatus to print the colour maps by one impression. Knight's method meant that the paper did not need to be removed from the press after each impression, thus giving a better chance of improved register, while allowing up to sixteen successive impressions to be made.⁵⁴ The colours used were blue, yellow, and red, in that order, and finally black to add the necessary letterpress, for example for the place names.⁵⁵ Thus Knight was a pioneer of the modern process of wet-on-wet colour printing, a process requiring quick drying inks "that were progressively less tacky."⁵⁶ Knight, like Baxter, used oil colours, and even tried to mechanise the inking process. Although Knight was not successful in perfecting a method of cheap mass colour printing, probably because the process was too slow, his books brought colour plates to the popular market on a wider scale than ever before. Knight only published a few coloured books and then discontinued colour printing altogether, the precise reason for this being unknown.

Mid-Century

By the middle of the century, when colour printed wood engravings were becoming more common, the firm of Vizetelly achieved importance in the field of the production of colour printed books such as gift books and children's books. Being expert engravers, much of their work was a success, the fact being that "the greatest difficulty in printing in colour from wood lay in the engraving."⁵⁷ Other notable printers who used colour wood engraving as an illustrative medium were Benjamin Fawcett, whose output was mainly in the area of natural history illustration, and the well-known Edmund Evans, both of whom, like Leighton, modified the Baxter process to tailor it to printing larger editions. These later printers had used a more efficient entirely relief colour method, employing wood blocks to build a picture from fewer colours without an intaglio key plate.⁵⁸

Benjamin Fawcett

Benjamin Fawcett was an English wood-block colour printer known for his high standards. Born in 1808 in Yorkshire, Fawcett operated his printing business at Driffield over a long period of time, dedicating his life to his work. He can be thought of as one of Bewick's successors; the basis of nearly all his work was wood engraving on the box-wood block. Whereas Bewick never printed in colour, Fawcett made his name as a colour printer: in their *Benjamin Fawcett: Engraver and Colour Printer*, Ruari and Antonia McLean have referred to Fawcett as the finest of the nineteenth century woodblock colour printers.⁵⁹ Early in his career, in 1844, he formed an alliance with the Reverend Morris who had moved to a nearby parish. Their common interest in natural history led to a long collaboration in book production, with Morris writing the texts and Fawcett being responsible for the production of the colour illustrations. An innate acute sense of colour was one of Fawcett's attributes, an ability that translated into the fact that a pure desire to print in colours was his chief motive, rather than a desire to maximise profits. Hence high standards were of more importance to Fawcett than cutting costs: he maintained his success without recourse to cheap colour printing but still produced a great many colour books in the second half of the nineteenth century.

Fawcett's colour printing achievement was due to many factors, one of which was the harmonious teamwork at the printery. With Fawcett the perfectionist setting the example in workmanship, the success of the firm's productions was also underpinned by the artistic ability of his apprentice, Alexander Francis Lydon, who not only had a gift for drawing, but who also became exceptionally skilled in the colour separation engraving work that was a crucial part of the plate preparation process. Although little is known about Fawcett's multiple wood block process, some of his press proofs have survived. From these, it can be

seen that Lydon often chose a key colour that served to both supply the natural hue for some of the detail as well as to provide a unifying element to draw the whole composition together. The printing procedure appears to have been that first the major colour blocks were decided, and then others were added to apply any extra desirable colours, the result being that the colour in Fawcett's finished plates has a quality of vivid richness that is characteristic of his work. Fawcett himself was painstaking, and spared no effort in choosing and grinding his pigments, mixing the inks, and importing the best papers. The quality of the inks was one of the secrets of Fawcett's success: his choice of stable mineral colours not only led to a finish that was dry and soft, but which also meant that his results were virtually permanent. This has allowed much of Fawcett's surviving colour printing to look as if it has been freshly printed, unlike Baxter's which has mostly faded. Fawcett's use of high quality materials was matched by his meticulous presswork, enabling him to achieve needle-fine register and "strong colours from sparingly inked blocks." It is known that Fawcett's habit was to painstakingly make numerous corrections until the desired standard was reached. As each plate was built from the overprinting of six to eight impressions, the skilled maintenance of an even platen pressure is also evidenced in the consistently high standards of colour printing that came from Fawcett's press.⁶⁰ (See Vol. 1, Plate 2, opp. 22.)

Edmund Evans

Edmund Evans, a man of vision and enterprise but also of simplicity and kindliness, was an artist who also printed in colours using a relief method. Setting up in business first as an engraver in 1847 and then as a printer by 1850, he early began to specialise in colour printing. Evans began his colour printing career with the production of "the bright cover designs for cheap yellow-paper-covered editions known as yellow-backs."⁶¹ This was the mid-Victorian period when wood engraving was at its height, and at the time wood engravers commanded considerable respect. Evans' engraving business flourished, as his strategy of simplifying the colour process to the use of two or three-colour blocks was effective, enabling him to produce colour in books more economically, including in the children's books for which he is well known. John Feather considers that he "was indeed largely responsible for the introduction of multi-coloured printing into ordinary commercial book production."⁶² Percy Muir has pointed out that Evans' significance consists in something more than his eminence as a colour printer. Not only did his best colour printing rival Baxter's standards, but he also had the ability to unify the textual and illustrative elements. That Evans "had an eye for the making of a book" contributed to the fact that "he raised the standards of book production at a time when they were very markedly in need of improvement."⁶³

Lithography and Colour Printing Advances from Europe

Alois Senefelder's Planographic Printing Included Colour Printing

For the future of graphics, including that of the graphic book, a leap forward had been taken in the early part of the nineteenth century when Senefelder's invention of lithography paved the way for further printing options, although the implications were not immediately realised by others. However Senefelder himself was remarkable in his realisation of the significance of his initial experiments and discovery of what was really a printing method which, as mentioned, depended on chemical principles. Senefelder was spurred to continue tirelessly in his experiments to improve this entirely new planographic printing, a process that came to be known as lithography, until his death in 1834. By this time Senefelder had in fact "already anticipated almost every other major development of his process," except for "the application of photography and the discovery of the principle of offset printing."⁶⁴

During attempts to transfer text and music characters from paper to a prepared Solnhöfen limestone surface, at the same time laterally reversing them so that they would be in normal mode after printing, Senefelder began to understand the principles of what became a new mode of printing. He saw that chemical affinities were the key that enabled both the printing and non-printing areas of the stone to be essentially at the same level. As discussed earlier, the principle, that when greasy ink is applied it adheres to the design on the stone but is repelled by the water, enables the design to be printed on paper pressed onto the stone. In 1912, *The Times Printing Number* described this aspect with particular regard to colour printing:

The process is a chemical one, and depends upon the combination of a fatty acid with the material used—stone, zinc, or aluminium. The drawing and transfer inks are mainly fats in such a concentrated state that the acid of the fat is very active. When used upon the stone or metal it makes an insoluble compound, and the new material thus formed is of a greasy character or repellant of water...The feature which governs the method is that the compound of the fatty acid and the material is practically without colour, and may be rolled up with any coloured ink, providing the surface is moist and the ink is slightly greasy.⁶⁵

An important early discovery made by Senefelder was of a suitable ink, made up of wax, soap and lampblack, that effected the transfer of the design. This was a considerable improvement on the use of pencil which was liable to rub off if used to draw directly on the stone. The essence of his initial discovery is described on page 31-32 of his treatise, *A Complete Course of Lithography* which was published in English in 1819. Senefelder said:

My whole process was, therefore, as follows:-to wash the polished stone with soap-water, to dry it well, to write or draw upon it with the composition ink of soap and wax, then to etch it with aqua-fortis; and lastly, to prepare it for printing with an infusion of gum-water. I had hoped to be able to dispense with the gum-water, but was soon convinced that it really enters into chemical affinity with the stone, and stops its pores still more effectually against the fat, and opens them to the water. In less than three days after my first idea, I produced as perfect and clear impressions, as any that have since been obtained.⁶⁶

Early experiments in connection with the publication of music led Senefelder to realise the possibilities for graphics, including the potential for coloured graphics. Senefelder's numerous refinements of the lithographic process, all described in his 1818 treatise, included discussion and description of various methods of printing in colours, including in gold and silver. Some colour illustrations were included in the treatise, for instance, a facsimile of a Mainz psalter initial in red, blue and black. From the early part of the century others had also made isolated attempts at colour lithography. One of the first in England was the use of red in the 1803 publication, *Specimens of Polyautography*, produced by Senefelder with one of his business partners, Johann Andre, soon after his early visit to England where a patent for the process of lithography was taken out in 1801. After only six months in England he returned to Munich where he already held a fifteen year privilege for lower Austria.

During the ensuing years Senefelder experimented with the application of lithography to textile printing, and also perfected a transfer method whereby a design is transferred from special paper to stone for printing, "a method much used by artists ever since."⁶⁷ He also explored the application of lithography to metals and composition plates, and the construction of suitable presses. He tried the adaptation of colour lithography for map printing. Senefelder's talent lay in the scope and variety of his exploration of all aspects of lithography rather than in his business acumen, and in spite of the privilege, many European printers began to use lithography, often learnt from Senefelder himself. In Germany especially lithography began to take hold, partly due to the promotion of the new process by Professor Mitterer who had seen the potential of lithography as an aid to teaching as well as its suitability to the cheap production of artist's drawings. Mitterer became a leading authority on the new process, which was named lithography in 1805, and which made great progress under his influence.⁶⁸

Pioneers of Chromolithography

Throughout the early period of lithography, the possibilities for the representation of tone had been explored, including systems of hatching and the use of tint stones to build up a tonal picture, usually in monochrome and from successive impressions in the old chiaroscuro style. The first lithograph considered to be of any importance was a coloured facsimile of the 1515 Dürer illustrations in the margins of the prayer book *Christlich-Mythologische Handzeichnungen* printed in 1808 at Munich by Strixner and Piloty, thought to have been probably under the supervision of Senefelder. In this production, coloured inks of green, purple, sepia and puce were used, although not on the same page. In 1818, J.A.

Barth of Breslau had produced the second edition of *Pacis Monumentum*, a collection of poems, with borders lithographed in several colours. Thus, chromolithography, as this style of printing was later named, “as distinguished from black-and-tint work... may be considered to date from the issue of *Pacis Monumentum*.”⁶⁹ This publication was followed by others which were lithographically colour printed, including Wilhelm Zahn’s notable work on ancient pictorial art in the buried cities of Campania, *Die Schonsten Ornament und Merkwurdigsten Gemalde aud Pompeji, Herkulanum und Stabiae*. This work, published between 1828 and 1859, was produced in several lithographic printeries in Berlin, including the Prussian State Printing Office. In the early parts of its production, some of the illustrations, which Burch describes as being coloured by plain flat solid tints, including black where necessary, are fine examples of the chromolithographer’s art of the twenties. Later parts included the representation of tone by stippling, a revival of an older tonal technique. In the thirties, the Munich colour printer, Franz Wieshaupt attempted to adapt the three-colour principle, first explored by Jacques Christophe Le Blon, to lithography. Wieshaupt’s attempt was not satisfactory at this stage, partly because the necessary transparent inks were not available. However, as R.M. Burch has said, “Germany led the way in chromo-lithography, as in most other branches of the graphic arts,”⁷⁰ The main applications of early German lithography were for art reproduction as well as for music printing.

French illustration of the early nineteenth century had begun in the classical style of Didot, with stereotyping allowing the production of larger and less expensive editions. But suddenly Romanticism replaced classicism with the appearance in 1828 of Delacroix’s illustrations to Goethe’s *Faust*, the fullpage lithographs which interpret the text being considered by Norma Levarie to be “full of verve, excitement and color.”⁷¹ In France, lithography had not at first advanced rapidly, partly due to political instability, but after the restoration of Louis XVIII to the throne in 1815, the presses of Godefroy Engelmann in Mulhouse and Lasteyrie and Engelmann in Paris were established, followed by Lasteyries’ own Paris press in 1816. Lithographic production here concentrated on the more ‘useful’ output, so that commercial work became dominant, including zoological and botanical book illustration, music, maps, and artwork—both professional and amateur.

Godefroy Engelmann

Godefroy Engelmann, who had studied the new art of lithographic printing in Germany, improved the process and became the leading French exponent of the art for twenty years, during which time he published two important treatises. By 1820, Engelmann’s lithographic

press had taken the lead and was to the fore particularly producing artist's prints. After 1820, lithography had spread rapidly in France with Paris becoming the leading world centre. Twyman notes that by the 1840s "all the main techniques used by artists for drawing on stone had really been evolved. Improvements now rested largely with the printer and were directed principally at finding a satisfactory method of producing colour prints by lithography."⁷²

By 1836, it was Engelmann who had perfected a similar method as had been used earlier by Le Blon for colour printing, this time successfully adapting it to the lithographic principle. In 1837 Engelmann obtained a ten year patent for the lithographic colour printing process which he called 'chromolithographie'. An advantage of chromolithography was that it increased artistic options by permitting the use of a large range of colours. In this process a separate stone was prepared for each colour to be used, a method which had earlier been suggested by Senefelder in his treatise. The image was divided into areas of colour, and separate stones were prepared for each. In practice, the number of stones used depended on the image to be printed, but for cheaper productions was confined to three, one each for the primary colours, red, blue and yellow, as Le Blon had done for intaglio printing in the eighteenth century. The main problem was that of obtaining perfect register. This problem, together with the separate one of manufacturing suitable coloured inks, lay in the technical area. Twyman considers this the reason that, in the second half of the century, the rapidly developing process of chromolithography was "taken out of the hands of artists and for nearly fifty years became almost entirely a commercial process,"⁷³ causing the separation of artist and draughtsman. It was not until the eighties that artists revived the process for their own use.

Colour Printing Becomes Commercial

When interest in the economic and industrial sides of the chromolithographic process began to increase, in France it became potentially a rival to letterpress printing.⁷⁴ Until the fifties, when powered lithographic machines were introduced,⁷⁵ handpresses were used, with various modifications of both the platen and the roller press being tried. In 1852 Sigl had obtained Austrian patents for a powered litho machine with a flat stone and roller that was damped and inked automatically. The questions of the development of suitable presses was one of the factors, recognised by Senefelder as a problem, that had at first held back the greater use of lithography. Senefelder himself developed several presses, including a pole press. Some of the presses adapted by Engelmann for lithographic colour work are illustrated in his *Traité de Lithographie*, published by his son in 1840.

In the forties, Engelmann's son, in partnership with the expert lithographer, Aug Graf, was producing lithographic plates of a high standard, for example for a series, published for the French government in 1845, of reproductions of paintings in the church of St. Savin in Poitou. Burch notes that in these reproductions "the old flat-tint method has here practically disappeared, and is replaced by a judicious blending of colours that foreshadowed the coming of the present [1910] type of chromo-lithograph, although the colouring is somewhat faint and cloudy."⁷⁶ In the second half of the century, the use of stippling on polished stones for tonal representation took over from the earlier chalk manner⁷⁷ used by artists on roughened stones, the change being necessary as the faster powered machines began to be used. The chalk style persisted for monochrome work, but for colour lithography, by the seventies stippling had largely replaced the earlier solid colour styles.⁷⁸ With the incorporation of this refinement, the process now constituted the standard technique of chromolithography that was to last well into the twentieth century, and which embodied the principles upon which later photographic colour printing processes were also to develop.⁷⁹

Lithography is Slowly Established in Britain

In England in the early part of the century, lithography had not become established quickly. Even though Senefelder had visited London, he had only stayed a short time, so that the early English lithographic printers "did not really understand how the process worked,"⁸⁰ and the Napoleonic wars had prevented them from travelling to Germany to learn, and cut off access to German lithographic stone supplies. After the publication of Senefelder's treatise, the very fact of Senefelder's thoroughness and his descriptions of numerous 'manners' of lithography, and of his many experiments, resulting in complicated detail, may have been merely confusing to those wishing to grasp elementary lithography. Although the process of lithography was very versatile—it could be used to reproduce imitations of practically every other process—this also contributed to the fact that at that time it did not have a well defined identity of its own. Eventually, both the English publisher, Rudolph Ackermann (originally from Saxony) and the artist Hullmandel did visit Germany to learn the art, and after this it began to become better established in England, being used in the future for a wide range of jobbing printing, portraits, maps, plans and circulars. The War Office was the first body to set up its own lithographic press in England in 1809. Autographic presses, such as those developed by the English firm of Waterlow were marketed by mid-century, and another improvement was heralded when, around the thirties, metal plates, at first zinc, were introduced as alternatives to the heavy slabs of limestone.⁸¹

One of the advantages of lithography was the ease of combining both text and image on the one page. But because it was relatively slower than letterpress printing, the use of lithography for jobbing printing in the first half of the nineteenth century was mainly confined to those jobs for which short runs were appropriate. Thus, although the potential was there, for book production at least, the advent of lithography did not immediately solve the inconvenience of the necessity for separate printing of text and image on separate presses. The advantage to artists of lithography lay in its autographic possibilities. The artist was able to draw directly on the stone with a wax crayon, without need for the intermediary skill of the wood or metal engraver. It was this which led to the eventual ousting of the middle-man, who had for so long been essential to the chain of work required in graphic printing. In the world of letterpress or intaglio printing, the artist's drawing had first to be translated to the block or plate by the engraver, and in the process, something of the artist's intent had often been lost. Another advantage afforded the artist by lithographic processes was mentioned by Michael Twyman: "the nature of lithography allowed for a range of marks with both hard and soft edges."⁸² In England, due to the popularity of aquatinting, there was already a market for topographical prints. Twyman comments that "it is no exaggeration to say that the approach to lithographic drawing was determined, as in aquatint, by the demands of the water-colour painter."⁸³ However, during the thirties and forties, colour was still commonly added to lithographs by hand. Many coloured lithographs were tinted in lemon or salmon, the practice often being to print a black outline on the tinted paper and to add the highlights by hand.

Charles Hullmandel and the First English Chromolithographs

The printer Charles Joseph Hullmandel was pivotal in the English expression of lithography, due to his work with J.D. Harding in the pursuit of methods of printing tonal effects that imitated watercolour paintings. It was in the twenties that they began their collaborative work. These endeavours culminated in the lithotint process that Hullmandel patented in 1840. Lithotint was a process whereby a print could be produced from a stone which had been prepared with graduated washes of ink, so that the finished product resembled a wash drawing executed by brush. The use of neutral tints rather than colours was characteristic of this genre, the prints being issued both singly or in collections. Although the lithotint technique spread to Europe, this style of lithography did not take root in France in the same way as it had done in England. This was due to the unpopularity of the 'brush-stroke' appearance of these prints, ironically the very characteristic that had been one of Hullmandel's main goals. Ruari Mclean considers that the English production of David Robert's *The Holy Land*, published in parts between 1842 and 1845, and later in three

volumes, represented, for “sheer size, the culmination of the lithotint.”⁸⁴ This topographical work, notable for the variety of techniques used to obtain half-tonal effects built up by means of chalk hatching, comprises one hundred and twenty four reproductive plates produced lithographically by Haghe. Especially for the depiction of skies, the Egypt and Nubia volumes showed an advance in the way tonal effects until then had been produced from tints, with a third grey-blue tint employed in the printing of many of the plates. For one plate, ‘The Approach of the Simoon’ the use of overprinting is such that it can be considered to be an early chromolithograph.⁸⁵ During the 1850s when such topographical images were popular, work was plentiful for many of the English printers, including those in the provincial towns.

In 1832 in London, Thomas de la Rue had patented a method of printing coloured playing cards using strong, quick-drying oil colour inks, and in order to obtain good register, he used a system of pins with matching points-holes in the stone situated at the corners of the steel plate laid over the sheet to be printed. R.M. Burch considers that de la Rue had in effect introduced a very early although rudimentary form of job chromolithography to England.⁸⁶ It is interesting that the first attempts at published colour plates for a book produced by lithography in England were made not by the direct choice of the printer but rather because of client demand. The events surrounding the effort made by Hullmandel in this direction has been constructed by Bamber Gascoigne in the paper ‘The Earliest English Chromolithographs’.⁸⁷ It appears that the work by George Hoskins, *Travels in Ethiopia*, published by Longmans in 1835, was the production that spurred Hullmandel to eventually try to print the colour for the four double page illustrations entirely in the press using lithography. Charles Hullmandel had already adopted lithography soon after its introduction to England for work in monochrome. It was his innovative disposition that was also a factor working in favour of his readiness to push the boundaries a little further in the attempt to fulfill his client’s expectations. Thus it came about that Hullmandel was to take some extra steps towards the beginnings of chromolithography in England.

The plates for *Travels in Ethiopia* were at first to be partly accomplished via chromolithography and partly by hand colouring. However, the author was not satisfied with the appearance of the colour in the early copies of the first edition. The black, red, blue and grey had been printed from lithographic stones with the rest of the colouring added by hand. In spite of attempts by Hoskins to supervise to ensure that the correct colouring was achieved, it was discovered that, particularly in a frieze which depicted a procession of Ethiopians from an Egyptian tomb at Thebes, the skull caps had been printed in black

instead of in blue. Moreover, the hand colouring gave “a powerful impression of incompetence,”⁸⁸ due to the fact that the artwork largely consisted of flat areas of colour; difficult to do well by hand painting. Notes of apology were printed to go out with the first urgently required orders, but Hoskin’s dissatisfaction caused Hullmandel to attempt to rectify the problems by trying to do away with the hand colouring altogether, as well as correcting the colour mistake. The result was that the later copies had the colour for the frieze plate printed entirely lithographically to a good standard and register accuracy was satisfactory. The success of this experiment led Hullmandel to apply the colour for the three other plates also entirely lithographically. The method he used seems to have involved printing more than one colour per stone, or by “rainbow inking which rolls varied tones of ink over different parts of the stone”⁸⁹ so that there was only a small amount of overprinting of colours. Gascoigne has shown that these plates are the first fully printed colour plates to have been achieved by lithography in England, and from his study of the publisher’s ledgers, the date given for the completed job was June 1835. Previously, this publication was thought to have been only partially printed in colour, presumably because copies examined were from the initial batch, most of which had probably gone to public institutions. Since the name chromolithography had been patented in France, Hullmandel, and others in England, often used instead the expression “Printed in Colours” when referring to this process.⁹⁰

Charles Hullmandel’s next attempt at lithographic colour printing was for the title *Colour as a Means of Art* by Frank Howard, but it was not a similar success, due to the much more demanding “very impressionistic” colours that were required to be reproduced for the illustrations. The difficulties and imperfect results caused him to resort in desperation to again having the colour added by hand, but he did not give up his efforts to print colour lithographically. Soon after this, in 1839, his perseverance again brought colour printing success for the plates in Thomas Shotter Boys’s *Picturesque Architecture in Paris, Ghent, Antwerp, Rouen*. (Plate 65.) Gascoigne asserts that “even if all the praise goes to Boys, probably rightly, for the making of the image on separate stones, the control of their printing and of the inks remains entirely Hullmandel’s achievement and is one of the great triumphs of English colour printing.”⁹¹ However, it was not to be until mid-century that the overprinting of colours became a recognised method of chromolithographic printing.⁹²

William Day, Owen Jones, Michael Hanhart, Noel Humphreys

As well as Charles Hullmandel, whose early work led to the establishment of the English style of lithographic colour printing, some other early English chromolithographers of note

were Day, Humphreys and Jones, the latter famous as a result of his publication *Plans, Elevations, Sections, and Details of the Alhambra*, which from the start he had envisaged printing in lithographic colour. William Day's lithographic firm had been operating in London since the twenties and had been mainly concerned with output of a utilitarian nature. Owen Jones, the Welsh architect, had returned from Spain with sketches for his project to produce an illustrated monograph on the Alhambra Palace at Granada, intended as a vehicle to record and convey the brightly coloured detail of the geometrically styled ornamentation. The colour printing for the project was so daunting that Day, for whom the Belgian artist Haghe worked, was the only printer willing to help him realise the publication. Because Day and Haghe could not take on the entire project, Jones set up his own lithographic press to help accomplish the printing, and by 1836, the production was well under way. Six or seven tints were used, as well as gilding which Burch said "in no wise disconcerted Jones or Day, who printed gold by lithographic methods with the same facility as other lithographers printed black."⁹³ This was a great technical achievement because although previously the printer Whittaker had used heated stereo plates to apply gold or silver, it is known that he accomplished this more by blocking than by printing, even though the process was kept secret at the time. By 1842, the first volume of *Alhambra* was published, and by 1845, the second. Ruari McLean has commented that after the appearance of the first volume, it was evident that "Jones' mastery of his new art [was] complete; page succeeds page of blue, scarlet and gold, and the foundations are laid, not only of a new kind of book illustration, but of a new school of designers, the pilers-on of reproduced ornament."⁹⁴ However, if Jones' *Alhambra* had ushered in a great new industry of printing in colour by chromolithography, nevertheless Hullmandel's style, which embodied a simpler concept and use of fewer colours, was closer to the approach which had led to more standard methods.⁹⁵ Joan Friedman (Literature Review: 15) has commented that Hullmandel had become so proficient in lithographic technique that even Ackermann had "soon abandoned his press and sent all litho work to Hullmandel".⁹⁶

One notable English printing firm that had come to the fore in the thirties and forties was that of Michael Hanhart, who had been manager of Engelmann's London press. Having

Plate 65: 'La Chapelle de l'Institut, Paris.'

Chromolithograph, 40.8 x 29.1 cm. designed and lithographed by Thomas Shutter Boys and printed by Charles Hullmandel as plate [XXIII] for *Picturesque Architecture in Paris, Ghent, Antwerp, Rouen, &c* (London: Thomas Boys, 1839).

Reproduced in Joan Friedman, *Color Printing in England, 1486-1870: An Exhibition, Yale Center for British Art, New Haven, 20 April to 25 June 1978* ([New Haven]: The Center, c1978), color plate XVIII.

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started his own press, Hanhart had begun first to specialise in printing tinted lithographs and later moved on to colour printing by chromolithography. Noel Humphreys, another printer famous for his colour work, was known especially for the style known as illuminated printing. Not only did Humphreys reproduce the colour and illumination of the old medieval manuscript pages, but he also drew inspiration from them, creating “fresh designs in their spirit”.⁹⁷ In his orientation to the past, as a printer his interests were akin to those of the later William Morris, but Humphreys’ interest in the illustrative possibilities was more especially oriented towards the effects of the combination of illumination and rich colour. Although not of even standard, many of Humphreys’ coloured books achieved attractive and innovative results.

Innovative English Firms and the ‘Modern’ Lithographic Style

By the fifties and sixties, a later development of the chromolithographic style was evident in the work of such firms as Day and Son for prints, books, journals and maps. Robert Carrick’s chromolithographic reproduction of Turner’s ‘A Vessel Burning Blue Lights’, printed at Day and Son in 1852, exemplifies this later style. Burch states that this can be considered to be one of the first of the “modern type of lithographic colour work, in which the black outline...is altogether dispensed with, the picture being the product of the colours alone.”⁹⁸ In 1856, J. Aresti, chromolithographer to the Queen, used three colour theory to reproduce a fresco by Michelangelo by overprinting from three stones, each inked in one of the three primary colours red, yellow and blue. Vincent Brooks, who took over Day and Son, carried on the work of that firm, producing plates for an 1862 edition of Shakespeare’s *Songs and Sonnets*, for which Burch considered the illustrations to be “excellent examples of lithography in blended tints.”⁹⁹

Because there was no patent held in England for chromolithography, many printers began to practise this form of printing by mid-century. The Great Exhibition of 1851, a forum for the display of the work of many of the contemporary printers, also resulted in the publication *The Industrial Arts of the Nineteenth Century*, which came out between 1851 and 1853 in forty parts with four plates in each, and served to record the state of the printers’ art of the period. R.M. Burch commented that the work was said to be “the most important application of chromo-lithography, to assist the connection which should subsist between art and industry, which has yet appeared.”¹⁰⁰ This production was printed by Day and Son via chromolithography using between seven and fourteen colour impressions upon a black outline for each plate. After the Great Exhibition, chromolithography began to take root and during the second half of the nineteenth century, came to be a method more commonly used

to print commercially for the mass market. However, due to the changes of style to suit the faster machine printing, the artists of the chalk manner period began to be replaced by the commercial stipplers, and in this climate, standards were often compromised. As scientific advances were extending the range of tools available to the lithographer, the vigour of the chromolithographic art was seen to be all too often declining.¹⁰¹

By the second half of the nineteenth century, lithography began to be used to produce a greater variety of printed material in addition to prints, book illustrations, maps, and music. The introduction of the jobbing platen press in the 1860s helped to make jobbing work cheaper because it enabled colour work to become faster, at the same time facilitating accurate registration. As colour became cheaper to print, ephemera in the form of such newcomers to the market as coloured postcards, greeting cards, and scraps began to become popular and colouring began to be used for printed posters, for both image and text.

Some Specialised 19th Century Processes

Nelsons

The English firm of Thomas Nelson and Sons were active from the late eighteen fifties and sixties, publishing small topographical views particularly for that specialised market segment, the railway tourists. They developed a hybrid printing method suited to speedy production in the new steam presses to cater to the popular demand. Bamber Gascoigne has made a particular study of these prints in his 1997 book *Milestones in Colour Printing 1457-1859: With a Bibliography of Nelson Prints*. Nelson prints were essentially pen-and-ink lithographs with the tint colours, typically two, added from engraved wood blocks, a method akin to that of Baxter. However, later, this firm also experimented with other methods of bringing colour to the mass market, and by the eighteen nineties were executing chromolithographic work in the usual style of the period.¹⁰²

Alois Auer, Henry Bradbury and Nature Printing

Stemming from the increasing emphasis on a requirement for verisimilitude for printed graphics, especially those of a scientific nature, an unusual method of colour printing known as nature printing was perfected in the nineteenth century in the Old World. Experiments to use the idea of printing from a naturally occurring object such as a feather or a leaf were not new, but in the 1850s Alois Auer brought the process to fuller fruition in Vienna.¹⁰³ His nature prints enjoyed favourable public reception, an example printed in three colours being plate 13 in *Die Entdeckung des Naturselbstdruckes* of 1854. (Plate 66, opp. page 722.)

The principal form of nature printing required an object that had been placed between heavy metal plates to be passed through two rollers, one of lead and one of copper or steel, the

pressure thus applied causing the object to be embedded in the lead plate. Coloured ink was applied to the stamped impression to ready the plate for printing. If several colours were used, these were applied by hand to appropriate areas of the plate and printed at one impression. An improved method required an electrotpe to be taken of the stamped impression "and from the relief thus obtained an intaglio electrotpe was made... that formed the actual printing plate."¹⁰⁴ The process was also adapted to lithography. For instance, after ink-covered leaves had been pressed onto the stone the design could be etched into it to allow printing. In this case the resulting print appeared embossed with the image standing up perhaps above a coloured ground. In 'Experimental Graphic Processes in England 1800-1859', Elizabeth Harris has cited Ferguson Branson as claiming that both he and William Aitken had first used a nature printing process based on lithography in 1853.¹⁰⁵ After Auer had developed his method of producing nature prints,¹⁰⁶ the Englishman Henry Bradbury learnt the process in Austria and then brought it to England where he secured an English patent in 1853. Around that time many related processes were being developed. By 1857 Christopher Dresser described to the Society of Arts methods he had used that ranged over lithographic, relief and intaglio styles in the paper 'A New System of Nature Printing'.¹⁰⁷

Auer himself provided nature prints for three journals, *Faust*, *Gutenberg* and *Kosmos*, using them as a promotion for the process. In 1854, Bradbury's first folio volume, *A Few Leaves Represented by 'Nature Printing'* containing thirty-three prints from wild flowers, printed in full colour, was published, according to Harris, "at the low price of 21s or 1s 6d for separate prints."¹⁰⁸ The method of inking the plate was to work from the darkest to the lightest colour, applying each to the appropriate area, with the plate being wiped between applications.

William Congreve, J.H. Ibbetson and Colour Banknote Printing

One specialised method of colour printing invented in response to the need to guard against bank-note forgery was the compound plate method developed by both Sir William Congreve and J.H. Ibbetson at about the same time. Congreve also invented a special printing machine for his process. In 1819 Congreve patented a method of constructing interlocking blocks that fitted together to make up the printing surface that he described in the publication *A Practical View of an Invention for Better Protecting Bank-notes Against Forgery*. In 1820 he took out a further patent for an improvement which further complicated the process in order to make it harder for forgers to copy the appearance of banknotes printed from the plates.

The essence of the invention, described by Burch, was to engrave a filigree design for relief printing over the joins between the parts of a metal printing surface, the interlocking ‘male’ and ‘female’ dies. The dies were split apart for inking, each part in a different colour, and then fitted back together for printing, so that perfect register was achieved. Much of this kind of colour printing was done by the firm Branston and Whiting, mainly for official documents. Lottery bills were also designed and printed in this way with the filigree design in green and the lettering white: the lottery brokers believed in the “drawing” power of colour. Another use for these filigree designs after the abolition of the lotteries, was for the printing of coloured borders in the popular Victorian drawing room scrap books, used for mounting collections of printed scraps.¹⁰⁹

Colour Printing Processes and Maps

Until the nineteenth century it had always been difficult for mapmakers to add colour from the press, particularly to large, flat areas of colour. Apart from a few isolated attempts to print in colours for maps, the application of colouring, where desired, had nearly always been by hand. Elizabeth Harris cites an early nineteenth century attempt by the printer Firmin Didot to print a map in colours to create an illustration as a part of patenting the method in 1823. Using intaglio and relief plates, eight impressions were needed, including two in black from formes of type, to add the textual elements. Part of the patent was the schematic colour to show map features, which were to be

keyed to levels of significance and shared by all features. The hierarchy of colours was, in descending order, blue, red, brown, dark green, light green, yellow. Thus the biggest rivers and tops of the highest mountains were blue. Second-class rivers were red, third were brown, and so on. A high mountain showed all five colours on its slopes.¹¹⁰

The successful result was due to the great skill and intense effort needed for the block making and the presswork, and included a special system to ensure perfect registration.

A comment made in the *Journal of the Royal Geographical Society* of 1845, on the occasion of the presentation by M. Dufrenoy of his *Memoir on the Colouring of Maps*, is indicative of the fact that colour was regarded as an important element of map-making, and a very useful tool. Of the element of colour it was said that it had “long been considered a powerful auxiliary to mere engraving in maps of every kind; indeed, for certain special purposes, as in geological maps, it is indispensable.”¹¹¹ The memoir described Dufrenoy’s

Plate 66: ‘Unidentified Flower.’

Nature printing in 3 colours, 29.6 x 19.3 cm. Engraved and printed by Alois Auer as plate [13] in his *Die Entdeckung des Naturselbstdruckes* (Vienna: Kaiserlich-Königlichen Hof- und Staatsdruckerei, 1854).

Reproduced in Joan Friedman, *Color Printing in England, 1486-1870: An Exhibition*, Yale Center for British Art, New Haven, 20 April to 25 June 1978 ([New Haven]: The Center, c1978), color plate XXII.

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Ref. No.: 02/2002

Naturselbstdruck.

Aus der k. k. Hof- und Staatsdruckerei zu Wien. 1853.

and M. Elie de Beaumont's method as being easy and accurate, both factors that contributed to the lowering of the costs of adding colour to maps.

Until the nineteenth century, intaglio engraving on copper plate, and later on pewter and steel had been the predominant method for map printing. During the nineteenth century most maps were produced from copper engraving or lithography, but for colour map printing, it was not until the introduction towards mid-century of chromolithography that the breakthrough that had been long awaited by mapmakers came. This was at last the technical improvement that for the first time enabled more successful and affordable mechanical colouring of maps. David Woodward has asserted that the nineteenth century demands of speed and versatility in printing, joined with the need to print extensive areas of flat tone and colour, saw the intaglio methods relentlessly replaced by lithography, lithographic transfer, photolithography, and in the twentieth century, offset lithography.¹¹² In fact lithography, which lent itself to the reproduction of graphic images, was well suited to the printing of maps, which can be considered as partially graphic entities, because it solved the problem of including textual elements integrally. In Austria, from 1826 onwards, many maps were being produced lithographically both for official purposes and also commercially. During the eighteenth twenties, lithographic printing output had begun to include a greater variety of cartographic printing, such as multiple sheet topographic maps, nautical charts, transportation maps, city maps, military maps and atlases. It was Franz Ritter von Hauslab, the compiler of the 1828 environ maps of Vienna, Graz, Brunn, and Lemburg, who introduced colour to lithography for map-making, just prior to the New Zealand period under study. In the same year, it is believed that "the first successful applications of two-colour lithographic printing to maps" was employed in Freiburg by Woerl and Herder to print a nineteen-sheet topographical series.¹¹³

¹ 'The Industrial Revolution', in *When Where and Why it Happened*, (Adelaide: The Griffin Press, 1993), 182.

² Norma Levarie, *The Art & History of Books* (New York: Da Capo Press, 1982), 257.

³ Michael Twyman, 'The Emergence of the Graphic Book in the 19th Century', in *A Millenium of the Book. Production Design & Illustration in Manuscript & Print 900-1900*, ed. Robin Myers & Michael Harris (Winchester: St. Paul's Bibliographies, 1994), 139.

⁴ Michael Twyman, *Printing 1770-1970: An Illustrated History of its Development and Uses in England*, reprint with a new foreward by Ruari McLean and an additional bibliography (London: British Library, 1998), 2.

⁵ Twyman, 'The Emergence of the Graphic Book in the 19th Century', 136.

⁶ Ruari McLean, *Victorian Book Design and Colour Printing*, 2nd ed., enl. and rev. (London: Faber, 1972), 34.

⁷ Geoffrey Wakeman, *The Production of Nineteenth Century Color Illustration* (Loughborough [Eng.]: Plough Press, 1976), 1.

⁸ Kurt Nassau, *The Physics and Chemistry of Color: The Fifteen Causes of Color* (New York: Wiley, c1983), 5, and Harold Osborne, ed., *Oxford Companion to Art* (New York: Oxford University Press, 1970; 1995), 259.

⁹ R.M. Burch, *Colour Printing and Colour Printers* (London: I. Pitman, 1910), 52.

- ¹⁰ Harold Curwen, *Processes of Graphic Reproduction in Printing*, 3rd ed. rev. and enl., rev. by Charles Mayo (London: Faber, 1963), 30.
- ¹¹ Osborne, ed., *Oxford Companion to Art*, 716.
- ¹² Burch, *Colour Printing and Colour Printers*, 62.
- ¹³ Robert A. Peddie, *An Outline of the History of Printing: To Which is Added the History of Printing in Colours* (London: Grafton & Co., 1917), 42.
- ¹⁴ T.M. MacRobert, *Fine Illustrations in Western European Printed Books* (London: Her Majesty's Stationery Office, 1969), 10.
- ¹⁵ John Feather, *A Dictionary of Book History* (London: Croom Helm, c1986), 24.
- ¹⁶ Morna Daniels, *Victorian Book Illustration* (London: The British Library, c1988), 7.
- ¹⁷ Feather, *A Dictionary of Book History*, 277.
- ¹⁸ MacRobert, *Fine Illustrations in Western European Printed Books*, 10.
- ¹⁹ Colin Clair, *A History of Printing in Britain* (London: Cassell, 1965), 230.
- ²⁰ *Inland Printer*, 19 no.5 (1897): 560-561.
- ²¹ S.H. Steinberg, *Five Hundred Years of Printing*, 4th ed. rev. by John Trevitt (New Castle, DE: Oak Knoll Press, 1996), 138.
- ²² Levarie, *The Art & History of Books*, 260.
- ²³ James Moran, *Printing Presses: History and Development from the Fifteenth Century to Modern Times* (London: Faber, 1973), 49.
- ²⁴ Joseph Blumenthal, *Art of the Printed Book, 1455-1955, Masterpieces of Typography Through Five Centuries From the Collections of the Pierpont Morgan Library*, with an essay by Joseph Blumenthal (New York: The Library, 1973), 32.
- ²⁵ *The Times*, 29th November 1814, in Steinberg, *Five Hundred Years of Printing*, 139.
- ²⁶ Moran, 'Koenig and the Cylinder Machine', chap. 7, in *Printing Presses*, 101-112.
- ²⁷ Geoffrey Wakeman, *Victorian Book Illustration: The Technical Revolution* (Newton Abbot: David & Charles, [1973]), 12.
- ²⁸ Moran, *Printing Presses*, 167.
- ²⁹ Colin Clair, *A History of European Printing* (London: Academic Press, 1976), 208; Steinberg, *Five Hundred Years of Printing*, 138-139.
- ³⁰ Twyman, *Printing 1770-1970*, 50.
- ³¹ Bamber Gascoigne, *How to Identify Prints: A Complete Guide to Manual and Mechanical Processes From Woodcut to Ink Jet* (London: Thames and Hudson, 1986), 70d.
- ³² Twyman, 'The Emergence of the Graphic Book in the 19th Century', 161.
- ³³ Twyman, *Printing 1770-1970*, 21.
- ³⁴ *Ibid.*, 45.
- ³⁵ Roy Osborne, 'Colorants', in Augustine Hope and Margaret Walch, introduction by Michel Pastoureau, *The Color Compendium* (New York: Van Nostrand Reinhold, c1990), 65.
- ³⁶ Clair, *A History of European Printing*, 389.
- ³⁷ McLean, *Victorian Book Design and Colour Printing*, 2nd ed., enl. and rev. (London: Faber, 1972), 34.
- ³⁸ Twyman, *Printing 1770-1970*, 48.
- ³⁹ Percy H Muir, *Victorian Illustrated Books* (London: Batsford, 1971), 151.
- ⁴⁰ Burch, *Colour Printing and Colour Printers*, 127.
- ⁴¹ C.T. Courtney Lewis, *George Baxter (Colour Printer): His Life and Work: A Manual for Collectors*, (London: 1908), 86.
- ⁴² *Ibid.*, 37-38.
- ⁴³ Wakeman, *The Production of Nineteenth Century Color Illustration*, 2.
- ⁴⁴ Burch, *Colour Printing and Colour Printers*, 130.
- ⁴⁵ Courtney Lewis, *George Baxter (Colour Printer)*, 43.
- ⁴⁶ McLean, *Victorian Book Design and Colour Printing*, 37.
- ⁴⁷ Alexander Turnbull Library, Drawings and Prints, items: B-088-011 and B-088-012.
- ⁴⁸ Burch, *Colour Printing and Colour Printers*, 127.
- ⁴⁹ Wakeman, *Victorian Book Illustration: The Technical Revolution* (Newton Abbot: David & Charles, [1973]), 45.
- ⁵⁰ Burch, *Colour Printing and Colour Printers*, 135.
- ⁵¹ Twyman, *Printing 1770-1970*, 43.
- ⁵² *Ibid.*, 38.
- ⁵³ Burch, *Colour Printing and Colour Printers*, 142.
- ⁵⁴ Wakeman, *Victorian Book Illustration*, 43.
- ⁵⁵ Burch, *Colour Printing and Colour Printers*, 142-3.

- ⁵⁶ Moran, *Printing Presses*, 167.
- ⁵⁷ McLean, *Victorian Book Design and Colour Printing*, 171.
- ⁵⁸ Twyman, *Printing 1770-1970*, 43.
- ⁵⁹ Ruari and Antonia McLean, *Benjamin Fawcett: Engraver and Colour Printer: With a List of His Books and Plates* (Aldershot: Scolar, c1988), 9.
- ⁶⁰ *Ibid.*, 35-41.
- ⁶¹ Levarie, *The Art & History of Books*, 271.
- ⁶² Feather, *A Dictionary of Book History*, 103-104.
- ⁶³ Muir, *Victorian Illustrated Books*, 157.
- ⁶⁴ Michael Twyman, *Lithography 1800-1850: The Techniques of Drawing on Stone in England and France and their Application in Works of Topography* (London: Oxford University Press, 1970), 17.
- ⁶⁵ *The Times Printing Number*, Tuesday September 10th, 1912, 159.
- ⁶⁶ Twyman, *Lithography 1800-1850*, 11.
- ⁶⁷ Osborne, ed., *Oxford Companion to Art*, 666.
- ⁶⁸ Twyman, *Lithography 1800-1850*, 19.
- ⁶⁹ Burch, *Colour Printing and Colour Printers*, 177.
- ⁷⁰ *Ibid.*, 179.
- ⁷¹ Levarie, *The Art & History of Books*, 260.
- ⁷² Twyman, *Lithography 1800-1850*, 160.
- ⁷³ *Ibid.*, 161.
- ⁷⁴ *Ibid.*, 162.
- ⁷⁵ Twyman, *Printing 1770-1970*, 57.
- ⁷⁶ Burch, *Colour Printing and Colour Printers*, 181.
- ⁷⁷ Gascoigne, *How to Identify Prints*, 19b and 53d.
- ⁷⁸ Wakeman, *The Production of Nineteenth Century Color Illustration*, 11.
- ⁷⁹ Twyman, *Printing 1770-1970*, 44.
- ⁸⁰ *Ibid.*, 26.
- ⁸¹ Wakeman, *Victorian Book Illustration: The Technical Revolution*, 40.
- ⁸² Twyman, *Printing 1770-1970*, 44.
- ⁸³ *Ibid.*, 27.
- ⁸⁴ McLean, *Victorian Book Design and Colour Printing*, 77.
- ⁸⁵ Twyman, *Lithography 1800-1850*, 223.
- ⁸⁶ Burch, *Colour Printing and Colour Printers*, 183.
- ⁸⁷ Bamber Gascoigne, 'The Earliest English Chromolithographs', in *Journal of the Printing Historical Society (JPHS)*, no.17 (1982/83): 63-71.
- ⁸⁸ *Ibid.*, 63-64.
- ⁸⁹ *Ibid.*, 68.
- ⁹⁰ Peddie, *An Outline of the History of Printing*, 43.
- ⁹¹ Gascoigne, 'The Earliest English Chromolithographs', 70.
- ⁹² Peddie, *An Outline of the History of Printing*, 44.
- ⁹³ Burch, *Colour Printing and Colour Printers*, 185.
- ⁹⁴ McLean, *Victorian Book Design and Colour Printing*, 78.
- ⁹⁵ Burch, *Colour Printing and Colour Printers*, 195.
- ⁹⁶ Joan Friedman, *Color Printing in England, 1486-1870: An Exhibition*, Yale Center for British Art, New Haven, 20 April to 25 June 1978 ([New Haven]: The Center, c1978), 43.
- ⁹⁷ University of Delaware Library, *Color Printing in the Nineteenth Century: An Exhibition at the Hugh M. Morris Library, August 27-December 19, 1996*, curated by Iris R. Snyder (Newark, Del.: The Library, 1986), 'Lithography'.
- Note: URL: <http://www.lib.udel.edu/ud/spec/exhibits/color/>
- ⁹⁸ Burch, *Colour Printing and Colour Printers*, 206.
- ⁹⁹ *Ibid.*, 208.
- ¹⁰⁰ *Ibid.*, 202.
- ¹⁰¹ *The Times Printing Number*, Tuesday September 10th, 1912, 172.
- ¹⁰² Gascoigne, *How to Identify Prints*, 30.
- ¹⁰³ In her article 'Experimental Graphic Processes in England 1800-1859. Part IV: Nature Printing', in *JPHS*, no.6 (1970): 53-70, Elizabeth Harris has described the general history of nature printing and on p.56 some of the early simpler forms of English nature printing, such as those used by Nottingham lace manufacturers to print their pattern books. These had been carried out "well before" Alois Auer had begun his nature printing experiments in earnest. After examples of the English lace prints had been brought to Auer's attention in 1852

he had been prompted to make further efforts to improve this branch of printing, one in which he had been interested since 1849 (p.57). The main English nature printing developments have been listed chronologically by Harris (p. 83-86) in 'Part V' of her paper, 'Explanation of Processes', 71-89.

¹⁰⁴ Wakeman, *Victorian Book Illustration*, 61.

¹⁰⁵ Harris, 'Experimental Graphic Processes in England 1800-1859. Part IV: Nature Printing', 62: the reference, in connection with a dispute concerning nature printing inventions, is to "*The Journal of the Society of Arts*, ii (1854), 258." However, Roderick Cave, an authority in this field, has communicated the following to me: "both Branson and Aitken mention the possibility of lithographic transfer from nature prints, but neither seems to have used it – all their surviving nature prints are intaglios." (August 2002.)

¹⁰⁶ Ibid, 57: Harris states that Alois Auer "took out an Austrian patent for the process in October 1852 under [Andrew] Worrington's name" (his assistant)...but "in April 1853 the patent was cancelled at Auer's request, 'thus to ensure to Austria not only the honour of the discovery, but also proof of disinterestedness'".

¹⁰⁷ Ibid., 63.

¹⁰⁸ Ibid., 59.

¹⁰⁹ Burch, *Colour Printing and Colour Printers*, 121-123.

¹¹⁰ Elizabeth M. Harris, 'Miscellaneous Map Printing Processes in the Nineteenth Century', chap. 5 in David Woodward, ed., *Five Centuries of Map Printing* (Chicago: University of Chicago Press, 1975), 129.

¹¹¹ Coolie Verner, 'Cooperplate Printing', chap. 3 in Woodward, *Five Centuries of Map Printing*, 70.

¹¹² David Woodward, 'Maps Music and the Printer: Graphic or Typographic', in *Printing History* (1986): 8.

¹¹³ Walter W. Ristow, 'Lithography and Maps 1796-1850', chap. 4 in Woodward, *Five Centuries of Map Printing*, 94.

COLOUR PRINTING PROCESSES AND THE PHOTOMECHANICAL ERA IN
BRITAIN

Northern Hemisphere Pioneers of Photography

Photography was to enable mechanisation of the production of printing surfaces. Sometimes photographic images themselves were used as actual printing surfaces. In addition, photography, a new means of generating images, came to be an art form in its own right. The heart of the new technology was the production of photographic prints from negatives which had been formed by the action of light on specified chemicals contained in a film. The negatives or the prints themselves could then become the originals from which reproductions could be made by means of printing from inked plates. Many photomechanical processes were developed to produce the printing plates, for example the exposure of a sensitized plate through a negative, the development of the image and then etching of the non-image areas, to leave the image in relief. Photographic prints had the inherent versatility to fulfil a wide spectrum of needs for images, and the potential to later be employed diversely in, for instance, the re-production of art works, the immediate recording of events, or the exact appearance of aspects of the world around us—objects, scenes and people.

Through its versatility, photography began to provide a range of new options for producing single prints or illustrations for reading matter and, in time, came to revolutionise the production of images for all forms of printed material. A great deal of experimentation began to take place in the field of photography from its beginnings in the nineteenth century onwards, and discoveries which led to the widespread commercial use of photomechanical printing processes eventually included colour processes. As applications of the principles of photography were explored, new ways of approaching methods by which coloured images could be obtained were also opened.

Photography became an important aid in meeting the demand, especially of the sciences, for verisimilitude, so that the means of determining scientific truth was extended and enhanced. The quality of colour was a part of this truth. Over the second half of the nineteenth century, and well before the development of colour films in the twentieth century, the application of photography to colour printing followed on the heels of its application to the production of monochrome images, whether printed from relief, planographic, or intaglio surfaces. By the beginning of the twentieth century, “the path was prepared for the wide commercial

application of photography to colour printing in all three major processes.”¹ In this way, photography was to become a tool of scientific enquiry. This aspect of the importance of photography as a tool has been summed up by William Ivins, who said that “for the first time it became possible to have a reproduction of a drawing or a painting or a piece of sculpture that told enough about the surface of its original for anyone who studied it to tell something about the qualities of the original.”² Not only as vehicles of knowledge were photographs to revolutionize the world of images, but they were also to profoundly affect the nature of artistic expression.³

It is known that in 1802, Thomas Wedgwood (son of the English potter Josiah Wedgwood) and Sir Humphrey Davy had made first steps towards the understanding of the principles of photography. Writing on the history of photography, John Szarkowsky (Literature Review: 17) stated that Wedgwood first succeeded in making temporary prints of objects such as leaves on glass, by the action of sunlight passing through them onto paper which had been coated with a solution of silver nitrate or silver chloride.⁴ In 1826, the Frenchman Joseph Nicéphore Niépce was the first to invent a process to make permanently fixed images via a camera when he discovered that if bitumen of Judea was exposed to light it hardened to form an acid resist. He coated a metal base with this substance, exposed it to light under copied engravings and so obtained an image that he called a heliograph. By etching the heliograph he was able print from it to make multiple exact copies of the image. In 1837, Louis Daguerre used a similar principle to fix reversed images on metal. Although the resulting ‘daguerreotypes’ proved difficult to etch, they were sometimes used in England as originals from which wood engravings were made for illustrative work, for example, for Mayhew’s *London Labour* of 1851. Daguerre documented his work in two early books on photography, published in 1839. In 1851, Frederick Archer invented the photographic wet-plate collodion process.⁵

About the same time, Fox Talbot had been experimenting in England along similar lines, using the light sensitive substance bichromated gelatine, and produced negatives from which he made paper prints known as calotypes, meaning “beautiful pictures”. Talbot patented his processes in 1841 and 1852. The first book to be illustrated with calotypes pasted in, *Pencil of Nature* by Fox Talbot, was published in 1844, and others followed on a variety of subjects, including 130 special copies of the *Reports of the Juries* from the Great Exhibition of 1851, each of which contained 155 prints. Being moderately priced, books with calotype illustrations became popular during the sixties, but problems included the fact that they were relatively slow to produce and that the prints faded, a drawback that led to

experiments in photolithography in which both Australian and New Zealand inventors were later involved.

Photography and Reproductive Printing

However, the new technology had ushered in an era when reproductions could theoretically be made "with a minimum of human intervention, though some years of experiment were needed before the photographic processes and those of engraving and printing were finally linked together."⁶ Until the nineteenth century, the faithful reproduction of an artist's work had depended on the skill of the craftsman, the engraver or lithographer who transferred it to block, plate or stone. By the middle of the century, developments in the transference of photographic images to the printing surface had begun to accelerate and consequently use of manual processes began a slow and steady decline. Although early developments towards photomechanical processes had involved experiments with intaglio plates, it was not until much later, in 1879, that photogravure, the most viable of the intaglio processes, was finally invented.

One of the strengths of photography was its ability to faithfully record continuous tones. This is a strength that is shared by the painting arts where visual beauty of continuous tone is also obtainable by the artist. But the nature of photography was to allow multiplication of copies, and in this way it was potentially a rival to printing. It is therefore not surprising that in the second half of the nineteenth century much experimental activity in connection with the new art of photography was directed towards achieving the perfection of tonal effects for printing plates using photomechanical means. An equal ability to represent continuous tonal quality to that possessed by the new competitor, photography, was sought by the printer for pictorial and reproductive work whether in colour or not.

After Niépce's initial experiments, Fox Talbot had also tried a photo engraving process, but this was never made commercial. Although his ideas were pursued by continental workers who used it for line etching to produce some book illustration, it did not seem to have been used for that purpose in England until the eighties. Paul Pretsch, from Vienna, was the first to market prints made from an intaglio surface produced with the aid of photography when he came to England and took out a patent for his process, photogalvanography, in 1854. Geoffrey Wakeman has described the process in detail in his book *Aspects of Victorian Lithography: Anastatic Printing and Photozincography*.⁷ From a photographically produced plate, Pretsch took an electrotpe cast from which he ultimately produced an intaglio printing surface, in a similar way to that used by Auer (for whom Pretsch had worked) for his nature printing process. Tones were produced as a result of the property of bichromated

gelatine (with which he coated the plate) to swell in direct proportion to its exposure to light, so that the reticulation of the surface produced a “cellular pattern” on the intaglio plate ultimately cast from it. However, Pretsch eventually abandoned the process probably because it had proved too difficult to obtain successful results from its use.⁸

James Clerk Maxwell’s Development of Colour Theory

Since the beginning of photography, colour had always been thought to be a future possibility, and the problem had been explored quite early. John Szarkowski has stated that “the first tentative approach to a solution sought a substance that would take on and hold the colors of the light that shined on it rather as sand records footprints.” Apparently the Reverend Levi Hill of Peekskill, New York, claimed in 1850 that he had managed to produce such a substance on daguerreotype plates, but unfortunately he had neglected to make good notes, and was afterwards unable to replicate the substance, thus anticipating in photographic terms, as Szarkowski puts it, the tragedy of “The Lost Chord.”⁹

It was James Clerk Maxwell who, following in the footsteps of Le Blon, had in the eighteen sixties again applied Newton’s theory of light to the problem when he was able to demonstrate a photographic three-colour separation principle that theoretically could be harnessed to colour printing methods, even though colour photographs were not yet available. However, at the time, knowledge of the science of colour theory was not well developed. Before a more easily repeatable application of three-colour photographic separation theory could be successfully developed to provide photomechanical colour printing methods, the printing processes themselves, to be predictably repeatable, also needed such advances as a scientific colour theory and the development of standard inks as a footing for practical procedure, rather than wholly relying on the skilled judgement of the artist which was in turn reliant on excellent colour vision, especially to criticise the proof with a view to colour adjustment. (See chapter 12.)

The first step made by Maxwell towards such development of the modern scientific approach to colour printing was his 1861 demonstration of the possibility of the separation of white light into three primary colours and the subsequent recombination of the three coloured lights to produce white light. This was to become a basis for modern colour theory as it became applied to colour printing in the context of the photographic separation procedure required to produce the colour printing plates. Using this approach, the image ultimately to be represented as a print must first be photographed three times through three different specified coloured filters to record on negatives the whole of the visible spectrum of light coming from that subject. The principle used is that of additive colour, that is, if red,

blue and green spectral lights are mixed in the right proportions, white light results. Through the use of photography in conjunction with coloured liquid filters, Maxwell found that the light reflected from any subject could be separated into three wavelength components representing the red, blue and green content of the subject. By making positive transparencies, Maxwell attempted to show that this process could also be reversed, and thus that it adhered to Newton's theory of light: that white light consists of a mixture of the colours of the visible spectrum. (Plate 67.)

However, in Maxwell's 1861 lecture demonstration, when the three separation transparencies of a coloured ribbon, taken through three coloured solutions, were superimposed and projected through a lantern to form a colour image of the ribbon once again, due to the fact that at the time the sensitivities of the photographic plates to red and green were poor, the true colour of the ribbon was not realised. Over the course of the next three decades, experimentation into the production of colour sensitive plates led to their eventual employment as envisaged by Maxwell.¹⁰ The principle involved can be demonstrated by first making three separation negatives for the red, blue and green components of an image, printing these three negatives "on new plates" (making positive transparencies) and then "project light through those three transparencies from three projectors onto the same screen – coloring the light of each projector by directing it through the same colour filter that was used to make the corresponding negative – one will produce something resembling a modern color photograph."¹¹ Maxwell also developed equations to describe the way in which light is modified when it falls on objects, and this was a large step forward in the understanding of the behaviour of colours, and contributed to placing colour printing on a more scientific basis.

Linking Photography and Image Printing: The Photomechanical Era

A revolution in the way that images were printed, whether in black and white or coloured, was ushered in with the linking of photography and printing. The coming of the photomechanical era enabled new methods to be employed in all the major printing processes, and the general thrust for greater mechanisation saw the transformation of colour printing from a largely art-based pursuit to a more scientifically-based activity in both hemispheres.

Early Northern Hemisphere Intaglio Photographic Processes

The First Colour Photomechanical Prints

Paul Pretsch's process had been further developed experimentally by the London lithographers, Lewis and Böhm, to supply colour to the intaglio prints made from the

process, by means of wood, metal or stone printing surfaces. R.M. Burch has stated that this process also had the distinction of being, in 1857, "the first example of colour being added by means of the press to photomechanical prints," and was a forerunner of the later Photochrom process,¹² for which the base was, however, usually collotype. (See later planographic processes below.) Although an early photogravure process, it was not at that stage a commercial success. The process was later used commercially by the English firm A. & C. Dawson from about 1872, as more experience had by then been gained in the handling of gelatine.

Early attempts at the photomechanical were in conjunction with intaglio processes, and have been traced by Geoffrey Wakeman. In 1864, Joseph Swan, an English physicist and chemist who was later knighted, had patented a process that made use of carbon tissue, which was a light sensitive paper, to print toned photographic images by means of which copper plates could be etched. An improvement to Swan's method resulted in the production of autotype prints, some of which were used to illustrate English books of the late sixties. The Autotype Company used the process from the eighteen sixties to produce art reproductions, but the autotype had the disadvantage that shrinkage occurred in the drying stage. However, Wakeman has commented that advantages possessed by "the autotype version of 1871" over albumen prints was both the wider range of colours they made possible and their ability to achieve "a good match with the originals."¹³

Experiments had been made using other methods of producing intaglio tone plates photographically in following years, and these included the Goupil process which derived from methods for making woodburytypes, the patent for which was bought by Adolphe Goupil in 1867. Named after their English inventor, woodburytypes were in the nature of imitation photographs, and had been used in the 1860s for book illustration. During the Goupil process, woodburytypes were produced by a method related to Swan's, but involved the extra step of first making a stereotype mould from the carbon relief, and then printing from it in a range of colours.

Using a similar method, the Parisian firm of Goupil and Company had made toned prints that were similar to mezzotints, using the fact that when a mixture of gum, glucose and

Plate 67:

i: Represents the three primary printing colours on a white page: cyan absorbs red, magenta absorbs green, and yellow absorbs blue, so that where the three are superimposed, red, green and blue are all absorbed resulting in black. This is a subtractive mixture.

ii: Represents projections of the three primary coloured lights, red, blue and green in darkness onto a white screen to produce white light where all three are superimposed. This is an additive mixture.

i. Subtractive colour synthesis

ii. Additive synthesis of coloured lights

bichromate covering a plate was exposed to light under a positive transparency, a gradation of tackiness of the mixture occurred. This led to coarse particles adhering to the areas corresponding to the darks, and the fine particles adhering to the lights when the plate was dusted with emery powder or fine glass. Using electrotyping, a lead mould was made, and from this a relief mould and finally an intaglio printing surface. Wakeman has mentioned that some of the prints made by Goupil and Company were exhibited in 1877 at the Caxton Exhibition, one of them being in colour, and explained that although the relief so produced was not marked, and hand-work was later needed to accentuate it, "the method worked because the rough grains in the gelatine caused cells to be formed in the mould and these allowed the electrotypes to hold ink."¹⁴ The addition of colour to the plates from which these prints were taken was apparently made by hand, *à la poupée*, from a standard coloured inker's reference copy, the printing to be at one impression, although exact details were not patented and hence kept secret.¹⁵ However, the groundwork had been laid for the later colour gravure processes. The Goupil process was known in England by 1879 as "photomezzotint."¹⁶

Advances in Photomechanical Planographic Printing

Photolithography and Photozincography Underpins Later Colour Printing

The introduction of photography into planographic photolithography and photozincography has been discussed in chapter 5, in relation to the work of the Australasian lithographers John Osborne and Herbert Deveril whose innovative work on photolithography in Melbourne and Wellington was influential. Such processes were especially advantageous to map printing. (See also below.)

Old World Innovators and the Relief Processes

One of the drawbacks that had always been inherent in intaglio printing was the fact that it was incompatible with letterpress printing, and in the nineteenth century this had not changed. In fact, it was not to be until the first decade of the twentieth century that the half-tone screen was used in conjunction with monochrome rotogravure, and for planographic printing, not until the development of offset lithography had paved the way for later processes of photographic colour, did lithography become more fully mechanised and therefore more economic. However, for illustrative work, the convenience resulting from the fact that relief blocks could be printed at the same time and locked into the same forme as type was an advantage, and had been a factor in making printed illustrations commercially viable for the mass market. In Britain from the eighteen fifties through the sixties and seventies it had been from wood engravings that the greatest number of illustrations was produced, although only a small percentage of them were colour printed. In

the Old World, photomechanical printing was to bring the greatest transformation to the production of illustrated books in the last two decades of the century through changes to the relief printing processes,¹⁷ and it was to be the relief processes that were the first to bring the photomechanical revolution to colour printing in general.

Robert Langton: an Early Pioneer in the Relief Printing of Images

From the time of photography's invention, attempts to print a photographic image on the surface of a woodblock for subsequent engraving had been tried. In the early fifties¹⁸ Robert Langton was experimenting by photographing on wood to provide an accurate copy for the wood engravers to work upon. Moisture needed in the processes hindered early attempts by causing damage to the block. Later processes were more successful although details seem to have been kept secret. However, the essence of the process was that an albumen silver print was pasted face downwards on the block with glue, and when dry, the paper backing was rubbed away to leave a laterally inverted image on the block. Geoffrey Wakeman considers that in England the process was in use from the 1860s, and that, for illustrative work, by 1896 its employment had gradually increased to the extent that photography on wood in England had become a separate trade. On the other hand, wood engraving, the illustrative method favoured by William Morris for his Kelmscott Press publications in the 1890s, had been in sharp decline from the early eighties onwards.¹⁹

The Gillots: Relief Printing and 'Process' Line Blocks

By 1875 the Frenchman Charles Gillot had been the first to succeed in using photography to directly produce metal relief printing plates. Known as 'line cuts', such plates are capable of reproducing solid lines but not areas of tone. Developed in 1872 from his father's invention in 1850 of paneiconography which was later known as gillotage, since much past illustration had been in line mode, Gillot's method proved suitable for such reproductive work as well as for the transference of contemporary line drawings to the printing surface. Gillot the elder had substituted zinc plates for lithographic stones, mounting them on wood to print in relief. Whereas the elder Gillot had used a transfer method to then make an etched relief block, the son made a photographic image directly on a zinc block.²⁰

Gillotage then became a process in which a zinc plate coated with a light-sensitive chemical was exposed to a photographic negative. After development of the negative and the etching away of the non-printing area, the image remained in relief and the plate was mounted on a block of type height for subsequent printing. Line blocks, also called process blocks, appear to have been used at first in France for the production of illustrations in periodicals such as *L'Art Pour Tous*, 1861-91. Later they were used to print book illustrations, the most

celebrated from the French press being Francesco de Quevedo's *Pablo de Segovia*, illustrated by Vierge and published in 1882. It is thought that photo-engraving was introduced to England in 1876 from France, and that by the late seventies that it was in commercial use. It is interesting to note that the process is a descendant of Blake's relief etching process of many years before.²¹ Many printing firms were experimenting with the production of line blocks by photomechanical means around this time, a great many variations in the basic process being tried. Geoffrey Wakeman has estimated that by the end of the century, printers "were affording work to at least the thirty-six firms listed [in *Kelly's Post Office Directory...for Printers*] under Automatic and Photographic Engravers."²²

Experiments in Relief Printing of Large Areas of Flat Tone

Engraving techniques needed to be adapted from wood engraving to accommodate to the new mechanical line-cut process blocks, but this took time. After an image had been effectively encoded on a block by photographic exposure to light, one problem was that Gillot's method of etching a block into relief was not satisfactory for printing in flat tones if the flat areas of tone were too large. Since the 1850s exploratory efforts towards applying photography to the mechanisation of printing tonal variations had been made by many workers both in England and on the continent, but it was not until the development of half-tone screens in the 1880s that really successful commercial photomechanical tonal processes were developed. Aubrey Beardsley had been one of the first to experiment, arriving at a system that represented areas of textured tone by means of small patterns such as dots. Other early experimenters included Rose-Joseph Lemerrier, Paul Pretsch, Alphonse Poitevin, and Fox Talbot himself.

Fox Talbot had at first explored a method of reproducing photographs in ink on ordinary paper in a printing press, using an etching process, and later using a plate with an aquatint ground to produce the half-tones. The latter was the method used for his patent specification in 1858. Fox Talbot had also experimented with the use of a screen to get half-tone reproductions. It has now been shown that, although not a success at that time because technical knowledge had not then advanced far enough, the half-tone method tried by Fox Talbot could have worked. Harold White has discussed this aspect in the paper 'A Note on W.H. Fox Talbot and Photo-engraving' in which he described a modern repetition of Fox Talbot's 1852 experiments.²³ However, the invention of viable half-tone screen methods for use in the printing industry had to wait thirty years beyond Fox Talbot's time.

A Northern Hemisphere Invention: The Half-tone Screen

Frederick Ives and George Meisenbach

It was not until 1881 that Frederick Ives of Philadelphia invented a commercial method for the relief printing of half-tones, although at first not by use of a screen. Ives' method involved "using dots that were obtained by pressing a woodburytype or swelled gelatine block against grained paper, thus making a pattern on its surface. The size of the dots would be proportional to the thickness of the woodburytype."²⁴ A year later, George Meisenbach used ruled lines which were turned to produce a cross-lined grid, and as a result patented his half-tone relief process.²⁵ This was an immediate success, showing the need for such a device, especially for relief printing which was compatible with letterpress. Use of the half-tone screen to achieve the appearance of tone variation in pictorial work was to eventually become commercially dominant. Meisenbach set up a London business in 1884 and by the nineties half-tone blocks were becoming established to produce popular journal illustrations, and were beginning to take over from wood engraving.

In his 1910 book, R.M. Burch described the principle of the half-tone screen. The early screens were made up of two plates of glass ruled with fine lines

which may vary in number from thirty to 200 or more per inch- and placed in contact with each other in opposite directions, so that the two sets of lines are crossed at an angle of ninety degrees, and form transparent squares. The interposition of this screen between the lens of the camera and the sensitive plate which is to receive the image, results in the light reflected from the object photographed being split up into an infinite number of small rays, each passing through one of the tiny squares between the crossing lines of the ruled glasses. The dark parts of the object reflect the light only feebly, and thus the rays, being small and thin, only affect a very minute portion of the sensitive surface, producing, when the plate is developed, a tiny dot. The rays from the lighter parts on the other hand, being stronger, produce larger dots.²⁶

The printing plates were then prepared by printing the negative onto the plate, reversing the tone representation in the process, the darks being represented by the larger dots, and the lights by the smaller. In the highlight areas the effect is of "small transparent openings, brought about by the joining-up of the corners of the dots arranged in chess-board fashion, as a result of the action of the screen."²⁷ The plate was prepared for relief etching to varying depths according to the dot pattern, so that the image contained corresponding tonal variations when printed. The finer the screen the less visible the dot pattern in the final printed picture, as the eye tends to run the dots together to form a more or less continuous tone impression. As with most technical developments for printing in black and white, the extra step to further develop the half-tone screen for colour printing soon followed.

American Influences: Frederick Ives and the Colour Half-tone

It was the second half of the nineteenth century that had seen a turn of the tide for the American printing industry. Whereas at the beginning of the century, the influence of Britain was still a dominant force, by the end, America was asserting its own influence on

the world of printing. As in Britain, a wood engraving style after Bewick was in use for illustrative work in the early decades. Alexander Anderson, the first American illustrator of any standing, had worked in that medium to illustrate the famous *General History of Quadrupeds* of 1804.

After the civil war of the eighteen sixties significant change was occurring as American industry expanded. This turned the tide, eventually leading to greater export from American shores, including the export of technical expertise and printing machines such as the linotype and monotype, as well as, from the eighties, colour machines such as the two-cylinder machines for colour from Huber and Hodgman. It was also in America that the Levy brothers, Louis and Max had, with Frederick Ives, invented the first commercial cross-lined screens, opening the way for the employment of half-tone plates for commercial illustrative work, early seen in the publication *Harpers* magazine.

By the mid-eighties also, Frederick Ives had further pursued pioneering experimentation into half-tones and then had pushed the experimental boundaries to adapt the crossline half-tone screen to colour printing.²⁸ This was one of the key discoveries that was to aid the cause of the mechanisation of colour printing, including in New Zealand. By 1881, Ives had first employed three single line screens for a three-colour process to make coloured half-tone from blocks, using red, green and blue, with black used to give extra definition and better shades.²⁹ R.M. Burch mentioned that during Ives' investigations he had reproduced chromolithographs, using the screens to make negatives "with bromide emulsion and treated with chlorophyll, eosin, and tannin, in order to dissect the colouring contained in the original."³⁰ It is an interesting fact that this important development for illustration, a colour half-tone process, was public property: although Ives had developed a satisfactory colour half-tone screen by the mid-eighties, it was not patented.³¹

Other Innovators in Colour Half-tone

In England, Dr E. Albert patented improvements in the use of colour screens, and in Germany Ernest Vogel did some early work in which he used a separate screen for each colour. One of the early problems of colour half-tone work was that the angles of the screens turned out to be critical because of the fact that undesirable moire-like patterning occurred with the superimposition of impressions needed for tri-chromatic printing. Several patents were taken out in the nineties in connection with the rectification of this problem. The Americans Max and Louis Levy introduced glass screens that had the ruled lines engraved in the surface, and this was to be an important factor in the future development of the three-colour process.

Maxwell's Colour Theory is Applied to Colour Printing

Maxwell's exploration of colour theory in the early 1860s had sparked off much effort by printers to exploit his findings to achieve printed colour more easily and reliably, and hence more cheaply. This eventually resulted in the modern three and four colour printing processes. Some of the first attempts had been frustrated by both technical and theoretical imperfections. One of the wrong directions taken was to use the traditional printing concept in accordance with post-Newton colour theory but employing inks in arbitrary, rather than standardised primary red, blue and yellow colours. This turned out to be inappropriate, due to the fact that colour printing essentially relies on a subtractive principle, and it was later found that for the best and most easily manipulated system, the primary colours must be standardised and carefully chosen for compatibility with the original photographic plates to facilitate reliably good results.

According to Maxwell's equations, light is modified when it falls on an object. The nature of the modification, which occurs at the surface of the object, is that the light is attenuated, different wavelengths being attenuated by different amounts. Some light is absorbed, and some reflected. In a subtractive system, white is the starting point. If an object is such that by successively laying down on it a substance that causes the shortwave light to be absorbed at the surface, followed by a substance that absorbs the middle wavelengths, followed by a longwave absorbing substance, then at that point the whole visible spectrum has been absorbed, resulting in black. That is, there is no visible light being reflected, therefore there is no colour perceived. (See plate 67.)

Consequently, perception of printed colour relies on the fact that as the ink is laid down by overprinting it successively subtracts light from the white paper, the unabsorbed light being reflected to the eye. If a red ink image is first laid down on the paper, it owes its colour appearance to the fact that when viewed in a daylight situation the paper has absorbed all but the red or short wave part of the visible light spectrum, reflecting the rest. If green is added on top of the red, this ink causes absorption by the paper of all but the middle of the spectrum, while blue subsequently added causes all but the short wave light to be absorbed. Black results whenever the accrual of pigment is such that it no longer allows the reflection of any wavelength of light. It can be seen that the property of transparency was important to printing inks, especially those employed in overprinting processes, in order that light is not excluded too rapidly.

After Maxwell had laid the groundwork, a first suggestion of three-colour printing was made in Vienna by Baron Ransonnet in 1865,³² and by 1869, Louis Ducos du Hauron set out

principles of additive and subtractive colour theories in the work *Les Couleurs en Photographie*. In the same year, Charles Cros first announced theories of three-colour printing using photographic separation.³³ However, it was not to be until the nineteen twenties that, through experiments in mixing coloured lights, quantification methods were developed so that mixtures of the three primary coloured lights, red, blue and green could be repeated to produce a given colour match. It had been learnt that all colours could be produced from these three primary colours, and from this a method of colour measurement based on the mixing of red, blue and green lights was developed. Anthony Mortimer has commented that “this principle is fundamental to most modern methods of colour reproduction whether by printing, photography or television.”³⁴

Thus modern colour printing developed by marrying photographic separation with successive over-printing of colour applied from photographically prepared plates, using a palette of transparent coloured inks that are in keeping with the filters used to obtain the separation negatives. After extensive testing in the mid-nineteen twenties, it was finally proven that the palette that gave best results for modern colour printing is roughly that complementary to red, blue and green light, that is, a palette of the colours, cyan, magenta and yellow respectively—the palette still in use. In the colour printing arena, where overprinting of colours constitutes a subtractive mixture, (in which light is gradually absorbed from a white page so that black eventually results), these three colours as primaries have been found to produce the greatest workable colour range, although the chemical constitution of the actual pigments used plays an important part.³⁵ As colours are laid down in the printing process

Cyan absorbs red, magenta absorbs green, and yellow absorbs blue. Thus if the three are added, red, green and blue are absorbed and this results in black. Cyan absorbs red, magenta absorbs green and yellow absorbs blue.

The plate is prepared by exposing it through the negative to actinic (ultra-violet) light, so that at this stage the negative is itself used as a filter. The light passes through the clearer area, or not-red part of the negative, hardening the light sensitive plate in those areas, thus recording an image of the not-red portions of the original, that is, of the complementary cyan (blue-green) areas. The non-image areas of the plate are then chemically washed away leaving a record of the reverse colour components to the filter used as the image on the positive plate.

If secondly the subject is photographed through a filter that transmits the blue, short wave light, then similarly the complementary yellow portion of the spectrum coming from the object can be recorded. In this case the image areas on the positive plate correspond to the non-blue, or yellow wavelength components of the subject. At this point it is helpful to note that yellow light is composed of the green and red wavelengths. If finally the photograph is taken through a filter that transmits the green or mid wavelengths, the complement of the total light coming from the subject is recorded in a similar manner. This time the image areas on the printing plate correspond to the non-green or magenta (red-blue) components of the subject.

Thus it can be seen that after the three photographic separations are made by exposing the original through three filters, red, green and blue, the resulting separation negatives contain silver deposit areas corresponding to these primary colour components of the original. During subsequent conversion of the negatives to positive plates, the tonal values are reversed. This concept, at the heart of modern photography, was one of the breakthroughs made by Fox Talbot. Each of the positive images produced by using filters to achieve a three colour separation then represents one of the three primary colour components of the original, but in reverse, that is, representing the colour that is complementary to the original filter used.³⁷

The Printing Process: Three or Four Colours

The chemistry of the photographic production of the image on the plates must provide for the image areas to represent these colour components, cyan, magenta and yellow (CMY) as described above. This is because the process must accommodate subsequent colour printing in which a subtractive colour principle operates. For the example above, when cyan ink is applied to the positive plate, the image areas, representing the no-red components of the original, or cyan-corresponding parts of the image, take up the ink and thus are printed. The colour appearance of the result is due to the subtractive principle, the fact that inks subtract light from white paper when they are laid down during printing. Thus after printing, the

cyan ink on the paper is seen as a blue-green colour because it reflects only the blue green light and absorbs (or subtracts) all the other spectral light.

The palette choice of cyan, magenta and yellow for the printing inks has been found in practice to be the best in the sense of allowing all others to be generated from them by overprinting. This is explained by the general principle that "all colours can be matched by a mixture of the three primary coloured lights,"³⁸ red, blue and green, and that the subtractive colour theory used in the printing trade is related to this additive colour principle in the way described. However, this relationship is imperfect, and in printing practice there are many compensatory procedures to cope with this. If analysed, it can be found that the requirement is that "the yellow printing contributes to all the colours in the print that contain yellow, namely reds, greens, browns and black. Similarly the magenta contributes to the reds, greens, browns, and black, and the cyan to the blues, greens, browns and black."³⁹ Thus all the colours and tints in the final picture are produced from the overprinting of cyan magenta and yellow proportionally to the density of the printing surface. (Plate 68.)

To avoid the finished effect having the appearance of a cheap print, many variables must be carefully considered, such as correct colour proportions, the right degree of pressure, and the density of the printing surface in addition to the achievement of accurate register. At first, many trichromatic printing attempts in the second half of the nineteenth century were faulty in a scientific sense partly because the scientific understanding of the behaviour of colour was in its infancy. As well, the science of the physiology of how we perceive colour, the reciprocal factor, was unresolved, and in fact was to remain so until the second half of the twentieth century. The understanding of how colour is perceived and also of how colours change according to the kind of light conditions operating during viewing gradually helped to improve scientific understanding over the course of the twentieth century and hence the ability to control the compensatory procedures alluded to.

Colour Compatibilities in Plates and Inks

From the eighteen sixties onwards, new colour knowledge was gradually gained which eventually resulted in the modern colour printing processes that depend upon scientific colour theory. In the *Process Work Year Book* of 1896, it was reported that in 1873 the German scientist Professor Hermann Vogel had first "found that a photographic plate could be made sensitive to different rays of colors".⁴⁰ These were the colours in the blue and green regions of the spectrum, and by 1882 the manufacture of orthochromatic plates which were sensitive to these colours (but not to red) had begun. It was not until 1902 that Arthur Traube and Adolf Miethe discovered the efficacy of ethyl red as a sensitizer for red light.

Also in the eighties, Vogel established that compatibility between the sensitive dyes used to make the photographic plates and the dyes used in the printing inks was important. In 1885 he said:

The sensitizer of the photographic plate must be used as printing ink; or if the sensitizer, being an aniline dye, could not be turned into a permanent printing ink, an ink has to be selected which shows a spectroscopic efficiency as alike as possible to the sensitizer.⁴¹

Another problem to be grappled with was that printers have always had to allow for the fact that, even when principles are thoroughly understood, printing inks are never pure in the sense of behaving as ideal primary colours. Thus the use of a fourth printing, a final black impression, remained controversial during this period, as it historically always had done. By 1891, Vogel had shown the promising results of adding a greyish tint at the German Exhibition in London, where he took a medal, but much more experimentation was yet needed for such colour processes to be standardised.

Northern Hemisphere Pioneers in Three-Colour Relief Printing

The eighteen eighties was the decade in which the linking of photography with the relief processes was beginning to transform image printing practice in the Old World, so that by the end of the nineteenth century, printing of images from blocks was to become more efficient. It was not until the eighteen nineties that three-colour printing processes had begun to be applied to the commercial production of images by relief printing from process blocks. Burch notes that in 1891, when photochromic prints from all the Continental firms were shown at the Royal Photographic Society lecture, only two, the firms of Angerer & Goschl of Vienna and Albert of Munich, showed three-colour prints produced by relief methods. Other prints in the exhibition had all been produced by planographic means.⁴² Because coloured process blocks were not signed by the blockmaker, the commercial development of this line of work for book illustration has been difficult to trace. However the contemporary trade journals show examples, such as those printed in the 1892 edition of *British Printer* in which some of the illustrations have been printed direct from relief blocks without a screen by Waterlow and Sons, who referred to them as 'chromo-typographic' blocks. Writing in 1917, Robert Peddie mentioned that by the end of 1891, several English firms had taken up colour process work, one of the first examples to have been widely seen being a plate of the racehorse that won the Derby in 1890, as it was produced at Waterlow & Sons as a supplement to the paper *Land & Water* in February 1892.⁴³ In the following

Plate 68: 'Reproduction of the Spectrum in Three-Colour Printing.' Negatives made by H.O. Klein in the Penrose Collodion Emulsion Laboratory with Dr. E. Albert's collodina emulsion. Published in the *Penrose Annual* 1902/03 to illustrate an article by the journal's editor, William Gamble, 'What is This Three-colour Process?' Opp. 4.

TAKEN WITH BLUE SENSATION SCREEN.

TAKEN WITH GREEN SENSATION SCREEN.

TAKEN WITH RED SENSATION SCREEN.

THE THREE COLOURS COMBINED.

REPRODUCTION OF THE SPECTRUM IN THREE-COLOUR PRINTING.

Negatives made by H. O. Klein in the Penrose Collodion Emulsion Laboratory with Dr. E. Albert's Collodion Emulsion.

year electrotypes of grained blocks for colour printing were advertised by Raithby, Lawrence, printers of *British Printer*,⁴⁴ indicating that there was a demand for them.

First Commercial Colour Three-colour and Half-tone Blocks

In 1892, The Photochromatic Printing Company of Belfast, Whitehead and Company, and Waterlow and Sons of London were the first in the United Kingdom to begin in earnest employing three-colour unscreened blocks commercially for colour printing. This process had been introduced from the continent, and at about the same time began to be used in America. After this many such three-colour blocks began also to be employed by British printers. The Prague firm of Husnik and Häusler had begun the use of trichromatic half-tone printing in 1891, an example of "a genuine trichromatic print"⁴⁵ appearing from this firm in the 1893 volume of the *British Printer*. Subsequently the process style of colour printing also gathered ground in Britain around the mid-nineties, the successive volumes of Cassel and Company's *Chums* bearing witness to this—the increasing appearance from 1893 onwards of three-colour prints in this publication being noted by Burch.⁴⁶

At this time, standards for use in many aspects of colour printing were being developed, including for the dyes used for transparent three-colour printing inks, and for colour screens. Combination ruled and grain screens were tried, and many combination colour printing processes, so that from the range of options, the most suitable for a particular job could be chosen, as different characteristic effects were achievable by each approach. The superimposition of impressions in tri-chromatic work necessitated the use of transparent inks to enable them to provide the subtle blending of colours necessary for tints, tones and shades by means of the property of the inks to show through one another, unlike printers' inks containing body or finely ground colouring matter held in suspension in a medium which was relatively more opaque, being more like painters pigments in this respect. A transparent ink needed the property of a dye which does not have body in itself, but which may be used to create a pigment by combination with a substance that can be ground. A dye is the colour produced in a substance by saturating it with a colouring agent, tint or hue, such as a coal-tar or metallic colour which may be dissolved in a medium, for instance, to make an ink.⁴⁷

Planographic Photomechanical Colour Printing and Tonal Values

Around the time that Fox Talbot had been experimenting with half-tone screens, the Frenchman Alphonse Poitevin had discovered that, on exposure to light, bichromated gelatine hardened to become not only less soluble but water repellent as well in a similar way to the lithographer's greasy crayon. Thus if the unhardened gelatine on a bichromated

gelatine coated plate was washed away after exposure through a photographic negative, the resulting image accepted the ink. He patented his process, the basis for the later collotype processes, in 1855. R.M. Burch explained that the almost continuous tone quality of collotype resulted from the fact that the absorption of water was “in exact accord with, but in inverse ratio to, the action of light,”⁴⁸ giving it similar properties to a lithographic stone. A granular effect was produced on the printing surface as the gelatine reticulated upon drying, giving a ground effect similar to an aquatint, with the tonal values represented by the degree of darkness of the resulting dot pattern. Thus, during printing, the ink was taken up in direct proportion to the action of the light on the plate. An invention incorporating the collotype process as a basis for colour printing was made by Mothay and Marechal of Metz around 1865, colour collotype being begun in 1870, by Josef Albert. Other means of obtaining photomechanical tints and tones for lithographic printing that were developed from around this time were the transfer patterns such as stipple and grain that were in use at least by 1870, and that were also employed for relief woodblock colour printing in the eighties. (Plate 69.) Such mechanical tints were marketed in England by Ben Day from about 1885. Geoffrey Wakeman has described their production:

The grained films marketed by Ben Day...[were] impressed with designs produced from hand work and cast in moulds faced with film...placed face down on the stone and rubbed off in the areas required...⁴⁹

Colour Collotype

The first experimental process exploring a three-colour separation method for colour printing using planographic photomechanical processes had been carried out in conjunction with collotype. After Josef Albert of Munich had begun to use the chemically determined collotype process as the basis for colour printing using three-colour separation principles, during the seventies other continental printers, such as Hustnik of Prague, followed his lead, although the collotype approach did not gain general acceptance in England until the nineties, when several firms began to use colour collotype. Geoffrey Wakeman has observed that although it was both slow and expensive, colour collotype was one of the best colour reproductive processes yet invented, because the collotype basis at the time provided “the most perfect tonal printing system yet seen.”⁵⁰

As well as the use of lithographic stone as a base for collotype, other materials including

Plate 69: ‘Transfer with Chromotints.’ showing 1. *Vanessa urticae*; 2.3. *Pyrameis cardui*.’

Published as Plate 13 in *Lloyd's Natural History*, 1894-97. The plate is a reproduction of plate XVIII from the earlier publication *Jardine's Naturalists' Library*, 1843, and uses chromotinting to reproduce the previously hand-coloured butterflies. The chromotinted reproduction appears in Geoffrey Wakeman, *The Production of Nineteenth Century Color Illustration* (Loughborough [Eng.]: Plough Press, 1976), 13.

By permission of the State Library of Victoria.

1. *Vanessa urticae*

2.3. *Pyrameis cardui*

Plate 13. Lloyd's natural history.
Transfer with chromotints.

glass and the metals zinc and later aluminium, the latter of which were able to be bent for fitting to a cylinder for rotary printing, were being used. Although excellent half-tone results were obtained using a collotype base for colour printing, one difficulty was that it was not easy to make it adhere well to its base. This meant that it did not stand up to much wear and tear in the printing process, and hence was not suitable for long runs. As well, it was very sensitive to atmospheric moisture changes, and needed skilled handling, especially if printing from successive colour collotypes. Thus collotype was expensive, and at a time when economical methods of colour printing were needed, it was only used to produce high quality colour reproductive work.

Photochromolithography: the Quest for the Colour Photograph

In the meantime, overseas photographic processes had been adapted to chromolithography, such a method for using negatives to act as the basis for colour printing having been proposed as far back as 1857 by Burnett who was a member of the Edinburgh Photographic Society. This proposed process involved stopping out the parts that were not to be printed of a series of identical negatives taken of the subject, one for each colour to be printed. The first negative was then to be transferred to the stone covered with a solution of asphaltum in ether, by exposing it to light through the negative, and printing in the appropriate colour. This was to be repeated using all the negatives in succession, accruing colour by overprinting so that the entire colour picture resulted. Although probably not used at the time, a similar idea, that is, an asphalt method of photochromolithography, was developed and first used commercially by a Swiss firm in Zurich in the eighties, when it was known as the 'Photostone' process. This process may have required only one negative to be used, with each successive colour being subtracted by lithographic artists who "proceeded by a system of elimination to take away the parts not required on each colour plate, at the same time strengthening or retouching the parts to be printed."⁵¹ The asphalt method of photolithography itself had been patented in 1852, but had not been used for colour work at that time. A photochrom gives the appearance of a colour photograph in a way similar to a modern screenless offset lithograph.

After the introduction of Photochromolithography to England, the Photocrom Company was founded in 1896, using the asphalt method to produce what was "in spirit if not in fact, a colour photograph, the base being generally a collotype print, either produced direct from the film or through the medium of transfer onto stone."⁵² Photochroms resulting from photochromolithography did not need to be produced from a scientifically based three-colour process, since they were not half-tone colour prints: a photochrom could be produced

from many more colour impressions if wanted. However, other printers were working to simplify chromolithography by exploring photolithographic processes for reproductive purposes, using only a few colours, where the original may have been produced by another method using many more. An example by Ernest Nister of Nuremburg, who took out a patent for his process in 1895, is a reproduction in three colours of a chromolithograph originally produced in fourteen colours in Fritz's *Handbuch für Lithographie und Steindruck*, published in 1897-1900. Among the books with coloured illustrations produced by photochromolithography in England are those produced by the firm of Griggs and Son, and include the 1897 production *Facsimiles from early Printed Books in the British Museum* and *Illuminated MSS. in the British Museum* by Warner, printed over the period 1899-1903. William Griggs had built experimentally on Col. James' photolithographic processes since the sixties, and developed colour transfer methods in the seventies, in 1882 publishing *Illustrated Pamphlet of Photo-chromolithography*. Geoffrey Wakeman, who has said that Griggs' photolithographic colour printing was his most important innovation, described his method thus:

He first printed a very faint impression from a photolitho transfer that comprised most of the outlines of the picture and formed a key for printing on the colours. His colour transfers were obtained by painting out on each negative the unwanted portions, so that the transfer would consist of only the portion of the picture to be printed in one particular shade. These transfers were then used to produce one stone for each colour, and they were printed in order on to the paper.⁵³

This method had been used by Col. James, but such part photomechanical planographic processes generally had not proved commercially viable for the mass market, as the production of the tonal contrasts necessary for most picture reproduction that was deemed satisfactory by the print market was not possible for cost-effective long-run production until the colour half-tone screen was developed later in the mid-eighties, providing part of the solution to the problem. Such a solution, initially pursued for relief colour-printing, was in time also developed for planographic and intaglio colour processes. In the meantime, experimentation proceeded on all fronts.

Mechanisation and Colour-Printed Maps

The photomechanical revolution also figured in the mechanisation of the printing of colour for maps during the second half of the nineteenth century. In the middle of the century, cartographers were still working under quite primitive conditions. At that time there was no access to electricity, no transparent drawing films, no rotary presses for running large editions, no screens for printing tints from one stone, and photomechanical plate-making processes were not yet in use.⁵⁴ Most maps could not be printed easily in more than one colour from the copperplate or from the stone, and the alteration of scale was difficult. Many firms had been slow to try alternative map-printing processes, due to their

considerable economic commitment to copper engraving and intaglio printing. In spite of this, C. Koeman, who has researched the photomechanical with regard to map printing has asserted that "it is true that, notwithstanding the modern equipment of today, the technical virtuosity seen in maps produced between 1850 and 1920 has never been surpassed."⁵⁵ In 1860 the first reprographic cameras had been introduced, heralding changes to the way cartographers were to work from that time onwards. At first however, photography had been used only reprographically and not for the generation of the printing surface. This was because many maps were required in relatively small editions of perhaps less than ten. A little later photography was used to effect lithographic transfers, and to directly make the printing surface.

It had been in the 1860s that the Ordnance Survey in Britain was using photozincography to produce maps and plans in facsimile, and at this time the process was being explored as a means of doing away with the heavy stones and using a lighter material as a substitute. In the second half of the nineteenth century experimentation had also been under way in other parts of the world in this connection, such as at the Australian Department of Lands and Survey, where lithographic printing was also in early use, and was in fact the principal process. As discussed, it was here that John Osborne worked on a photolithographic process to be used specifically for map printing. (See chapter 5.)

In France, the process of zincography for printing colour maps was in use by the seventies, where it was brought to a high standard. Using this process, a new edition of *Carte de France* on 950 sheets in five colours was produced in the late nineteenth century. The process was different to modern zincography which consists of lithographic printing from a zinc plate, although going by the same name. For the earlier process, an image was first made by photographic means and transferred to a coated zinc plate by photographing through the negative for the production of proofs. The proofs were then transferred to a zinc plate by means of a press. Next the image was lightly engraved with a steel needle to produce ink-holding grooves on the surface of the plate that had been chemically prepared to resist the ink. The advantage for map printing was twofold. Not only were finer lines obtainable than by means of lithography, but also, because it was a dry process, no water being necessary, "it guaranteed excellent register of the various colors."⁵⁶

In the eighties, pattern-producing methods other than halftones were employed to facilitate colour map printing, with standard symbol textures and colours often being incorporated on the printing surface by means of a paper transfer technique. Especially used for the

geological maps which were prevalent at the time, and which required conventions for colours and symbols, they were published in the 1889 *Standards for Geological Cartography*. Examples are to be seen in the first geological maps to be produced for the United States Geological Survey around that time, the last years of the century.

Another nineteenth century process that enabled in particular the printing of flat colour on maps was invented around the eighteen sixties by Charles Eckstein, who at the time was director of the Dutch Topographical Department of the Ministry of Defense. The Eckstein process provided for the lithographic printing of multi-colours by a three-colour process in which the colour was applied from three stones, one for each of the primary colours, red, blue and yellow. "All the shades of one color were printed from one stone, whereon a parallel line screen of uniform density had been drawn mechanically and subsequently etched."⁵⁷ Koeman gives a detailed account of the Eckstein process which allows various graduated tone values to be produced for each colour from the controlled graduation of the etching times. Among the high quality Dutch maps produced between 1864 and 1910 by this means, the topographical maps of Java and Madura demonstrate the suitability of the Eckstein colour system to the handling of cartographic complexities. This system is the more remarkable in that it predated the invention of the half-tone screen for colour work by twenty years, and worked by the production of many colours from the superposition of the three screened colours. Its use spread to Austria and Sweden where it was employed to reproduce geological maps. Koeman has commented that in spite of the slowness of the processes, and the fact that revisions to plates were extremely difficult, its legacy is some of the "most attractive map specimens of the nineteenth century."⁵⁸

The process of heliogravure was also developed in Europe in the nineteenth century particularly for map-making. As in the photomechanical age engravers became fewer, efforts were needed to find a worthy substitute for the engraver's art. In 1875, copper engraving was still viewed as the superior technique for mapmaking, although anastatic printing and lithography "either on stone or zinc, subdivided into gravure, drawing with lithographic ink, and drawing with crayon"⁵⁹ were the other main processes in use. A new alternative, heliogravure, developed by the military survey in Vienna between 1872 and 1885 produced such good results that it was acclaimed throughout Europe as an excellent topographical mapping achievement. The heliogravure process employed photography for scale reduction and electroplating to produce the plates, achieving a more economic cartographic method than copper engraving without sacrificing quality.⁶⁰

Offset Lithography and Maps

The invention of offset printing in the early years of the twentieth century, discussed in chapter 6, had the potential to particularly come into its own where long print runs were needed. As discussed by Koeman⁶¹, it was offset lithography that was also to eventually have a beneficial effect on map printing. In spite of some reluctance to make use of the cheaper lithographic processes, by the end of the nineteenth century, engravers were becoming less common and the major alternative processes of copper plating and heliogravure were becoming more expensive by comparison. While the output from the copperplate press was around six to eight copies per hour, the lithographic hand-press yielded twenty to fifty per hour, rising to three to five hundred per hour if steam driven. The original stone was preserved as the master copy and printing took place from a transfer image from which up to four thousand impressions could be taken before a new transfer had to be made. The process of heliogravure which became popular during the last part of the nineteenth century had become a viable rival to copperplate engraving. The excellent results were achieved by both the application of photography to fair drawing reduction and also to the production of intaglio plates in conjunction with an electroplating process. Heliogravure was estimated to have been around four times less expensive than copper plating in the 1880s, but it was not speedy. The making of the heliogravure plate alone took around five weeks from exposure, through developing, electroplating and finally retouching.

Another step forward, the invention of the chromium-gum copying process made this possible by improving the durability of plates. This meant that for long runs, the capabilities of the plate could be matched to those of the offset press. Previously, for large editions printed from photomechanically produced plates, the problem had been the lack of strength of the light-sensitive coatings for running large editions. This was due to the fact that "during the exposure, the emulsion hardens and, after developing, takes the ink, but in the course of time the printing elements wear out."⁶² In 1901, a new method of plate making, also called deep etching, was invented by Dr Strecker, and is a process that is still in use for lithographic printing from metal. The essence is the initial use of a positive rather than a negative.

Instead of a negative, a positive is printed down on the chromium-gum coating. After exposure, the non-hardened lines under the diapositive are washed off and the bare metal is etched with a weak acid. The hardened emulsion under the transparent parts of the diapositive serves as a protective coating. Next the plate is rubbed with a lacquer that sticks to the metal. Subsequently greasy ink, which sticks to the lacquer, is rubbed onto the plate. It is then cleaned with a brush and water and is ready for printing eight to ten thousand copies.⁶³

Due to the fact that many of the topographic survey master copies had been created on stone, there was a considerable time lag before offset machines were introduced for map

printing. It was not until between 1925-30 that the use of zinc superseded stone, but then generally only for new series. The Military Topographical Survey of Austria had been the first to install an offset press in 1910. Soon after this two-colour printing by offset had been introduced in Europe also for military survey.⁶⁴

Photogravure and Colour

Karel Klic

Around 1875, Karel Klic of Switzerland had first investigated photo intaglio methods, had made further experiments in 1879, and by 1895, assisted by Samuel Fawcett, he had produced his first successful prints at Storey Brothers of Lancaster, calico printers and sail clothmakers, where he had arrived early in the 1890s.⁶⁵ Because these photogravure processes still involved handwork they were slow and expensive, being mainly confined to the high quality colour reproduction of oil paintings or old engravings. The process of photogravure is particularly suited to art reproduction because of its superb ability for the rendition of soft, rich continuous tone.⁶⁶ Examples seen in *Great Masters of the Louvre Gallery* are the reproductions produced from some of Goupil's plates, published in 1899-1900. This publication was considered to be, aesthetically, a great achievement. When the process had been perfected it was marketed by the Rembrandt Intaglio Printing Company, although for some years it was limited to the production of prints.⁶⁷ Otto Lilien states that Klic made the first three-colour photogravure in 1905 on a wallpaper printing press. The impressions were taken from a cylinder, although prints were embossed with a plate mark to maintain the impression that they were genuine heliogravures printed on a starwheel press. The process was kept secret, and neither Fawcett nor Klic took out patents. By 1906, the first reproductive colour prints were being produced in long runs by the Rembrandt Intaglio Company from the photogravure process, and in the next few years numerous such prints came on the market.⁶⁸

Colour Gravure Comes of Age

The first photogravure illustration to have appeared in a daily paper had been for the Canadian *Saturday Globe* of 28 March, 1891, when a photograph of Wilfred Laurier was featured, three weeks after the 1891 election. Particularly in Paris, Vienna, and New York, colour printing of a high standard, although expensive, was being achieved by means of photogravure quite early in the new century. In England some of this high-class printing was also issued from the Art Reproduction Company. After first attempts had been made in 1908, in the following year both the Rembrandt Company of Lancaster, and the Van Dyck Gravure Company of New York were able to successfully print colour photogravures on a rotary press at a speed of several thousands per hour from separate plates. R.M. Burch

asserted that this development heralded a method of producing superior colour that was nevertheless cheaper to produce, moreover with "the flat mechanical effects of the trichromatic process being altogether absent."⁶⁹

By the time that Burch was writing in 1910, the first fast speed photogravure presses were in use for the printing of newspapers and magazines, the German newspaper *Frieburger Zeitung* being the first paper to carry illustrations printed on normal newsprint by this method in that year. The rotary press was built by the firm Société Alsacienne de Constructions Mécaniques. The British weekly, the *Southend Standard* had begun to use the same process in 1911.⁷⁰ By this time, although colour printing was appearing in the American Sunday newspapers, for images coming off the fast-running rotary machines, it was often the case that neither the colour nor the register was of a good standard.

The State of the Art in Britain to 1914.

From Geoffrey Wakeman's bar-graphs showing different illustrative methods in use in each decade from 1850-1900 in Victorian England,⁷¹ an indication of the relative importance of various colour printing methods can be observed, and used to indicate progressive changes in the range of colour printing possibilities as time went on. In the fifties, when photographs were just appearing, and when wood engraving and lithography were the dominant illustrative processes, accounting for almost thirty and around twenty five percent of total production respectively, engraving and etching accounted for just under a further twenty-five percent of all illustrative production, while colour printed wood engravings accounted for only three percent. However, colour planographic processes accounted for just under twenty percent of all graphics produced as illustrations, and chromolithographic processes were used to produce just over half, and tint lithography just under half of these.

By the sixties, the relative incidence of the utilization of these processes had not greatly changed proportionately, but there was a definite increase, although not yet in colour, in photographically produced illustration, especially photographs themselves, which in that decade had been used for around fifteen percent of total illustration, and photolithographs had begun to appear. By the seventies, colour printed wood engravings had declined, as had tinted lithographs, although chromolithography was still accounting for around eight percent of all illustrations. Photolithographs were increasing and other planographically produced illustrations such as heliotypes and collotypes were beginning to be seen. For typographical colour work, by the sixties, woodcut letters facilitated relief colour printing of jobbing items such as posters, which had begun to appear since the early forties in two to

three colours.⁷² From the fifties such colour printing had also been given a boost by the greater availability of better inks.

The eighties marked the decade in which wood engravings had given way to line illustration and half-tone, while coloured wood engraving had made a re-appearance. Chromolithography had declined and tinted lithographs had disappeared, but lithographs had not: at this particular stage colour itself was simply not as prevalent as heretofore. By the decade of the nineties, the photomechanical was dominant, with relief processes producing nearly half of all illustrative matter; half-tone producing thirty percent, line engraving eighteen percent, and coloured wood engravings another one percent. From intaglio processes, just over a further third were produced: photo intaglio was used to execute twenty-seven percent, engravings around three percent, and etchings four, while planographic printing, which also included the photomechanical, made up the remaining seventeen percent. Of these, nine percent were collotypes, lithographs about six percent and tinted lithographs around two. These were the major processes, but many other experimental processes were being explored for commercial viability.

At this stage, photomechanical colour illustration was in its infancy in Britain, and especially for intaglio and planographic colour printing more research had to be done to effectively harness the photomechanical processes to commercial colour printing in these spheres. However, in the last decade of the nineteenth century photomechanical colour was being added from the press using both relief and planographic processes: colour half-tones, colour collotypes and photochromolithographs were on the market.

Photomechanical Variety

By 1891, a list of the names of the "large and bewildering number" of processes for book illustration, many of them colour processes, had been collected by a correspondent to the *Gutenberg-Journal*, and later printed by R.C. Harding in *Typo*, with the comment that the list might be greatly extended:

Tissiérography, zincography, paniconography (or gilotage...), photogravure, photozincography, heliogravure, heliography, heliotype, heliochromotype, hélioglyptie, phototype, hélioplanography, photoglyptie, phototypography, photochromo, pantotype, woodburytype, panotype, albertype, typochromo, callotype, autotype, diaphanotype, chrysogypy, gelatinography, léténotype, lencography, chaostype.⁷³

As well as the plethora of existing processes, many combination colour processes were coming into use at the time, and the variety of trade names being established increased still further. By the beginning of the twentieth century, colour printing had come of age, and the inventions of the second half of the nineteenth century had begun the transformation of the

processes from largely art-based methods to more scientific procedures, paving the way for colour printing to reach into all corners of the twentieth century mass market. Around the turn of the century, chromolithography was still being used, more on the continent, to colour half-tone key blocks, by the process known as Autochrom, and was often used to reproduce such items as picture postcards. Burch commented that this process was “best suited to the reproduction of ordinary negatives, or silver prints, thus avoiding the use of orthochromatic negatives.”⁷⁴ It was not to be until 1935 that the first Kodachrome film was marketed.⁷⁵ By the early years of the twentieth century, colour gravure had also appeared, and by 1910 offset lithography had begun to facilitate the improvement of photomechanical planographic colour printing in Britain. (See also chapter 6.) The photomechanical changes that occurred in the British printing industry were a part of the nineteenth century industrial revolution, against which a closer chronology for a similar shift from colour processes based on art towards those that were facilitated by successive scientific discoveries can also be traced for New Zealand, as discussed in volume 1, section 3.

¹ Michael Twyman, *Printing 1770-1970: An Illustrated History of its Development and Uses in England*, reprint, with a new foreword by Ruari McLean and an additional bibliography (London: British Library, 1998), 47.

² William Ivins, *Prints and Visual Communication* (Cambridge, Mass.: M.I.T. Press, 1969), 176.

³ National Art Gallery, *Face to Face: A Survey of Artists' Prints* (Wellington: National Art Gallery, 1986), introduction.

⁴ John Szarkowski, *Photography until Now* (New York: Museum of Modern Art, 1989), 21.

⁵ John Hedgecoe, *The Art of Colour Photography* (London: Mitchell Beazley Publishers, 1978), 256.

⁶ Harold Osborne, ed., *Oxford Companion to Art* (New York: Oxford University Press, 1970; 1995), 973-974.

⁷ Geoffrey Wakeman, *Aspects of Victorian Lithography: Anastatic Printing and Photozincography* (Loughborough [Eng.]: Plough Press, 1970).

⁸ Geoffrey Wakeman, *Victorian Book Illustration: The Technical Revolution* (Newton Abbot: David & Charles, [1973]), 120.

⁹ Szarkowski, *Photography Until Now*, 265.

¹⁰ William Gamble in R.M. Burch, *Colour Printing and Colour Printers* (London: I. Pitman, 1910), 253-4.

¹¹ Szarkowski, *Photography Until Now*, 265.

¹² R.M. Burch, *Colour Printing and Colour Printers*, (London: I. Pitman, 1910), 221.

¹³ Wakeman, *Victorian Book Illustration*, 104.

¹⁴ *Ibid.*, 124.

¹⁵ Burch, *Colour Printing and Colour Printers*, 222.

¹⁶ Wakeman, *Victorian Book Illustration*, 124.

¹⁷ John Feather, *A Dictionary of Book History* (London: Croom Helm, c1986), 205.

¹⁸ Wakeman, *Victorian Book Illustration*, 76-79.

¹⁹ *Ibid.*, 80-81.

²⁰ *Ibid.*, 131.

²¹ Osborne, ed., *Oxford Companion to Art*, 974.

²² Wakeman, *Victorian Book Illustration*, 131-134.

²³ Harold White, 'A Note on W.H. Fox Talbot and Photo-engraving', in *Journal of the Printing Historical Society*, no.13 (1978/79): 64-65.

²⁴ Wakeman, *Victorian Book Illustration*, 139.

²⁵ Twyman, *Printing 1770-1970*, 32.

²⁶ Burch, *Colour Printing and Colour Printers*, 233.

²⁷ *Ibid.*, 234.

²⁸ *Ibid.*, 233.

- ²⁹ Feather, *A Dictionary of Book History*, 72.
- ³⁰ Burch, *Colour Printing and Colour Printers*, 232.
- ³¹ Twyman, *Printing 1770-1970*, 47.
- ³² F. Matthias and John Gartner, *Historical Events in the Graphic Arts* (Melbourne: The Melbourne Technical College, Department of Printing, 1935), 19.
- ³³ Hedgecoe, *The Art of Colour Photography*, 256.
- ³⁴ Anthony Mortimer, *Colour Reproduction in the Printing Industry* (Surrey: Pira International, 1991), 28.
- ³⁵ Osborne, ed., *Oxford Companion to Art*, 260.
- ³⁶ Mortimer, *Colour Reproduction in the Printing Industry*, 30-31.
- ³⁷ *Ibid.*, 42: fig. 2.11, 'The Principle of Separation'.
- ³⁸ *Ibid.*, 29.
- ³⁹ *Ibid.*, 8.
- ⁴⁰ Martin Cohn, 'Three-color Process: Its History and Adaptability to Printing Methods', in the *Process Work Year Book*, 1896, 33.
- ⁴¹ *Ibid.*
- ⁴² Burch, *Colour Printing and Colour Printers*, 237.
- ⁴³ Robert Alexander Peddie, *An Outline of the History of Printing: To Which is Added the History of Printing in Colours* (London: Grafton & Co., 1917), 49.
- ⁴⁴ Wakeman, *Victorian Book Illustration*, 155.
- ⁴⁵ *Ibid.*
- ⁴⁶ Burch, *Colour Printing and Colour Printers*, 239.
- ⁴⁷ Articles in the *Process Year Book* and the *British Printer* appeared on such subjects at around this time.
- ⁴⁸ Burch, *Colour Printing and Colour Printers*, 225.
- ⁴⁹ Geoffrey Wakeman, *Victorian Colour Printing* (Loughborough [Eng.]: Plough Press, 1981), 27.
- ⁵⁰ Wakeman, *Victorian Book Illustration*, 99.
- ⁵¹ Gamble, 'Modern Colour Processes', in Burch, *Colour Printing and Colour Printers*, 265-266.
- ⁵² Burch, *Colour Printing and Colour Printers*, 214.
- ⁵³ Wakeman, *Victorian Book Illustration*, 92.
- ⁵⁴ C. Koeman, 'The Application of Photography to Map Printing and the Transition to Offset Lithography', in David Woodward, *Five Centuries of Map Printing*, 139.
- ⁵⁵ *Ibid.*, 139.
- ⁵⁶ *Ibid.*, 146.
- ⁵⁷ *Ibid.*, 147.
- ⁵⁸ *Ibid.*, 149.
- ⁵⁹ *Ibid.*, 145.
- ⁶⁰ *Ibid.*, 149-150.
- ⁶¹ *Ibid.*, 151-152.
- ⁶² *Ibid.*, 151.
- ⁶³ *Ibid.*
- ⁶⁴ *Ibid.*, 152.
- ⁶⁵ Otto M. Lilien, *History of Industrial Gravure Printing Up to 1920* (London: Lund Humphries, 1972), 46.
- ⁶⁶ Osborne, ed., *Oxford Companion to Art*, 974.
- ⁶⁷ Colin Clair, *A History of European Printing* (London: Academic Press, 1976), 382.
- ⁶⁸ Lilien, *History of Industrial Gravure Printing Up to 1920*, 52.
- ⁶⁹ Burch, *Colour Printing and Colour Printers*, 223.
- ⁷⁰ Clair, *A History of European Printing*, 382.
- ⁷¹ Wakeman, *Victorian Book Illustration*, 161.
- ⁷² Twyman, *Printing 1770-1970*, 45-46.
- ⁷³ *Typo*, 5 (May 1891): 76.
- ⁷⁴ Burch, *Colour Printing and Colour Printers*, 216.
- ⁷⁵ Hedgecoe, *The Art of Colour Photography*, 1978.

BRITISH COLOUR PRINTING IN THE MARKETPLACE

19th Century British Colour Printed Reading Matter

Early Nineteenth Century Britain and its European Setting

At the beginning of the nineteenth century, many fortunate factors had come together to bring book illustration in England to a level of importance that was comparable with that in Germany and France. An upsurge of creativity was in progress, with some of the major contributors being Blake, Bewick, Turner and Martin. As well, general printing standards had been rising due to the efforts of such eighteenth century figures as Caslon and Baskerville, so that for the first time English books were both "respected and bought by connoisseurs abroad."¹ This was a period when the taste for watercolour was at its height and the economy was more buoyant, but although by then the aquatint method had been introduced, at the time of the Napoleonic wars around 1795, the fact that the supply of engraved plates and prints to Britain had been cut off was a stimulus to their production in England. Political instability had also hindered the progress of colour printing in France. All these factors meant that the time was right for excellence in British book illustration, and a golden age ensued in the period between 1790 and 1840.²

As pointed out by Norma Levarie, for English books it had been the formal perfection of Bodoni's books that had set the style in the first two decades of the new century.³ Although hand-colouring was the usual method of applying colour to the aquatints of the day and there were few examples in England with more than two printed colours, in general standards were high. One early botanical work, *The Temple of Flora or New Illustration of the Sexual System* published in 1807, one of the best of that genre of any period, foreshadowed the focus on botanical subjects of nineteenth century illustrative art, a focus that was later to be mirrored in New Zealand. The work contains aquatints printed in three colours from a single plate, but finished with hand-colouring. Rudolph Ackermann, the German artist and publisher who had come to London in 1795, had gained a reputation for excellence in aquatint, and it has been said by Ruari McLean that it was his first English production, *The Microcosm of London*, published between 1808 and 1810, that had "set new standards in coloured book illustration in Britain." The hand colouring had been executed by refugee artists from the continent.⁴ This was an example of migration of both personnel and technique that was to act as a catalyst for change in the wider British industry.

Other publishers had followed suit, so that hand colouring became a popular style used in the first quarter of the nineteenth century for producing coloured books, and helped to encourage the taste for colour in the marketplace. Another well-known title from this period was Daniell's *Voyage Round Great Britain*, published in 1825, which had the colour added partly *à la poupée* and partly by hand. Aquatint was also still in demand as a means of producing prints. As pointed out by Stanley Hayter, aquatint employed for art reproduction had been capable of imitating painted surfaces in a way that was almost as perfect as that provided by the later photographic processes, and "in some cases [it] was perhaps even more accurate."⁵ As well as the retarding influence of the Napoleonic wars, artists' initial suspicion of the revolutionary technique caused lithography to go through a protracted gestation period in England, but the eventual rise of the new lithography, which was a cheaper and more flexible process, had seen the aquatinter's art in decline.

Social, Intellectual and Print Cultural Influences

It was in the course of the nineteenth century that the expectations of the average man had begun to rise, partly due to the advent of compulsory education, and it was this that was at the root of the necessity for the development of what has been termed an entirely new publishing trade for the growing middle classes, and this necessity included a pressure for the development of viable methods of mass colour printing.⁶ Michael Twyman has stated that it was "highly significant ... that books and magazines began to be fully illustrated in the nineteenth century, despite the extra cost involved" and that "this point alone might be taken as evidence for the underlying demand for the graphic book."⁷

It is interesting that as the ability to mass produce printed material progressed, amongst the greater volume of items coming from the press was much that was in the category of dogma and tradition, but more graphic and coloured material was also being printed, and a hierarchy of reading matter emerged. Many of the social changes were gradual, and the path to learning was not smooth for everyone: for instance, in this period serious or learned reading was not considered suitable for women. It was then thought that even novel reading among fashionable young ladies would lead to such things as "hysteria" or "the vapours", and the Victorian psychiatrist Thomas Clouston warned that "if women who spent their energies on their brains married, they seldom had more than one or two children, and only puny creatures at that, whom they cannot nurse, and who either die in youth or grow up to be feeble minded folks."⁸ Attitudes such as these served to keep women in their place, with reading aspirations that did not go far beyond those of their children.

The Victorian scrap book and the coloured women's magazine served to fill the gap for this section of society for whom higher learning was for so long denied. Rather than being intended for reading, the prolifically illustrated scrap book was designed to be looked at, the exterior usually being particularly attractive. At the time, steel engravings were the usual illustrations found in scrap books. However, the 1834 *Scrap Book*, published in Fisher's *Drawing Room Scrap Book* series which was produced between the 1830s and the 1850s, is interesting from the point of view of colour printing in that it contained one of Baxter's earliest colour prints as a frontispiece. In the arena of children's books the nineteenth century was to be the period in which printed colour began to appear on the market in the form of toy books, gift books and picture books. Success in this section of the market often depended on the skilful use of colour, and the introduction of more economical and sophisticated methods of printing in colours began to serve this end, as many colour printing innovations were tested in children's books.

The Gothic revival, which had begun in the eighteenth century, originating at first in literature and also as a breakaway in architecture from the prevailing classicism, had caused an interest in the medieval era, and had a particular expression in England in the nineteenth century. Sir Kenneth Clark referred to this movement as "the most widespread and influential artistic movement which England has ever produced."⁹ The Gothic revival had also re-created interest amongst antiquarians and scholars in illuminated and decorated medieval manuscripts, and this taste then led to the need for the means to print the characteristic initials and decorated borders in colour. As mentioned, a later important influence in the growing taste for colour was the publication of M.E. Chevreul's treatise *The Principles of Harmony and the Contrast of Colours, and their Applications to the Arts*, published in France in 1839, and in English translation in 1854. This publication greatly influenced colour theory and sparked interest not only among artists, but also among many others who were interested in the application of colour principles to many fields, including those of apparel, fabric, and wallpaper, as well as architecture, map-colouring and other aspects of printing. Chevreul stated the principles of colour harmony, the law of simultaneous contrast of colours and revealed the facts of visual mixtures: it has been said that "no other writer has had a greater influence in the field of art and theory of the visual and aesthetic realms of color."¹⁰

In the climate of experiment in the graphic fields of the time, one of the important thrusts was for the improvement of techniques to advance the realization of verisimilitude for printed colour, especially for scientific works where this was of paramount importance.

Previously, hand-colouring mistakes or approximations would have had serious consequences for the veracity of, for instance, colour information on a map as it related to the key. Michael Twyman has said that the increasing need was for “a reliable method of producing a number of identical, or as nearly identical as possible, copies of a scientific diagram or illustration,”¹¹ and was another factor that spurred the need for colour printing development because colour was an obvious visual element that could be advantageously employed to represent factual content in such items as maps. As the industrial revolution progressed, and new machines enabled faster printing, a further influential factor was that hand-colouring for the larger editions that were becoming possible could not keep up with market demand in either quantity or quality. The pressure was there to develop colour printing techniques that would be viable commercially in the new industrial climate.

Social changes that were creating pressure for an increasingly larger printed output in a greater variety of formats went hand in hand with an increased ability to meet that need. The inventions that were part and parcel of the industrial revolution had produced a diversity of machines and tools to solve the technical problems. When this new ability was coupled with knowledge, both old and new, of how to make the basic printing surfaces and plates, the synergy led to a whole new range of printing options emerging during the nineteenth century. As a result, the printing and publishing trade expanded as mechanisation in many areas lowered costs and greater production and distribution efficiencies were achieved. With machines overtaking the old craft methods, one result, as Levarie has observed, was that “very early the books begin to have a familiar look; we recognise them as belonging to our world.”¹²

This was the period in which John Ruskin, the English critic and art theorist was influential. His philosophical approach had led to the advocacy of the naturalistic style which led many artists, including those working in New Zealand, such as George O'Brien and J.C. Richmond, to attempt to represent the natural world as it appeared, so to mirror its natural beauty in their works. Such a trend followed into book illustration and print editions, as artists were called upon to prepare originals from which printing plates were made. The adoption of such a mode fitted with the impartial observation required as a part of a rising nineteenth century interest in science. This brought with it a marketplace demand for images which offered such verisimilitude, a characteristic which photography had the potential ability to provide. In some cases it was considered that photographs themselves could be used for illustrative purposes, but reliable colour photography was yet a long way off. Another limiting factor was that photographs did not exist to fill illustration needs that

predated the invention, although photography was sometimes instrumental in overcoming this difficulty if used to facilitate the reproduction of past illustrations for re-use in contemporary publications.

As new printing processes were created the climate was right for renewed attempts to solve the problem of printing in colours, and as many new options were created to fulfil needs for colour graphics in established formats such as maps and book illustration, and in addition, as the industrial age gave rise to new formats, fresh opportunities were created for visual enrichment using the advantages of colour. The return of printed colour after a long absence has been seen by Twyman as “paramount in the development of the graphic book in the 19th century; its significance extends beyond verisimilitude, and takes many forms.”¹³

Colour in Illustrated Books and Periodicals

At the time of George Baxter, the field for colour printing was wide open in England, and Baxter, aiming to print true colour reproductions of water colours or paintings entirely from the press, had seen the potential, and from around 1830 was able to fill a market niche. Although his major output was for the print market, Baxter also produced prints for book illustration, especially frontispieces which were easily detachable for use as separate prints. Baxter’s biographer, Charles Thomas Courtney Lewis has recorded over one hundred book titles that contain illustrations by Baxter.¹⁴ The first book to contain a print from Baxter’s patented process was Mudie’s *Feathered Tribes of the British Islands* (1834),¹⁵ then other Mudie books that followed in 1835. The publication, *The Pictorial Album; or, Cabinet of Paintings* of 1837, intended for the Christmas annual market, was a one-off production containing eleven typically small, richly coloured reproductions of paintings from Baxter’s process. Speaking of these, Ruari McLean asserted that “it is certain that nothing like the colour plates had ever been seen before.”¹⁶ Although it appears that the book was not a success in business terms, it is interesting because it was the first book published in England for the popular market to have the illustrations printed in colour.

Books from English Wood-block Colour Printers

Although the pressure was there to print coloured books for the mass market, other colour plate books were destined for the wealthy and the connoisseur for whom many expensively colour printed books were produced. McLean rates the title *History of the Orders of Knighthood of the British Empire* by Sir Harris Nicolas, printed by Whittingham and published by Pickering in 1842, as an example of a great Victorian book. This was not only because the typography was by Whittingham, wood engravings by Mary Byfield, and the prose by Nicolas, but also because Baxter had supplied the series of coloured illustrations

for the four quarto volumes.¹⁷ To give them an illuminated quality, Baxter had used gold leaf instead of yellow ink for the plates. Percy Muir considered that their overall production was so good that he thought it doubtful that their technical quality could be surpassed even in the twentieth century.¹⁸

Towards the end of the eighteenth century, Charles Whittingham the elder had established the Chiswick Press, which built up a reputation for high printing standards. This reputation was enhanced during the 1840s when Henry Shaw, whose lifelong antiquarian interests led to many publications on this subject, particularly on illuminated manuscript art, had most of his books printed there. Many of Shaw's productions included lavish illustration, upon which he spared no expense. A variety of the basic processes used in the production of illustrative plates, such as aquatint, woodcut and lithography were shown in Shaw's work. The Chiswick press was equal to Shaw's projects, their colour work being of a high standard. *The Encyclopaedia of Ornament*, completed in 1842, included some after the Baxter process of chromoxylography. This showcase book was the forerunner of many similar publications that followed the Great Exhibition.¹⁹ Much of the magnificent colour was used as a vehicle to reproductively present the gold and colour that embellished old manuscripts to the nineteenth century marketplace.

A later production from the Chiswick Press, Byrne's edition of *The First Six Books of the Elements of Euclid*, was designed and printed in colours from wood by Whittingham, and published by Pickering in 1847. This highly original volume made use of colour as a memory aid for students, substituting colours for diagrams and as symbols, referring for example to angles, not as A or B... but showing them in perhaps red or blue. In tandem with the publisher Pickering, under Charles Whittingham the younger, the Chiswick became the greatest press of the Victorian era. His antique style prayer books were printed on handmade papers in black and red, one example, *Queen Elizabeth's Prayerbook*, published in 1869, being a masterpiece. The younger Charles Whittingham was described by R.M. Burch as "mixing and grinding his colours on a marble slab, and taking infinite pains to get them to the proper consistency and shade"²⁰ in order to give excellent solid colour. However, eventually the colour work was discontinued at the Chiswick Press because of the expense.

A contemporary of Baxter, Charles Knight, a printer who was exploring colour for the mass marketplace, had turned his attention to the market for books and periodicals rather than that for prints. His prolific use of wood block illustrations greatly stimulated their

increasing production. In conjunction with the Society for the Diffusion of Useful Knowledge, Knight was a pioneer in the field of cheap periodicals, having begun *Penny Magazine* in 1832. This publication had achieved a circulation of 200,000 copies per week by 1832,²¹ and lasted until 1862. It was Knight's 'Illuminated Printing' process that was employed as he strove to supply coloured books for the general populace, the actual printing being accomplished by the firm of William Clowes and Sons. One of the finest of his productions, which appeared early in the period under study, was the well-known *Old England*, a publication in two volumes that was issued between 1844 and 1845 in ninety-six parts. Serial publication was used to make it more affordable. In addition to numerous wood engravings, each volume contained twelve colour plates, which, although not reaching the standard of Baxter, either for detail or finish, were admirable especially for their chiaroscuro effect. Burch considered that "there is a boldness and originality about some of these pictures that forms a welcome change from the rather finical elaboration of Baxter."²²

By 1845, a colour printed gift book *The Rose Garden of Persia* by Louisa Costello had appeared on the market from the Vizetelly brothers who were active in wood-block illustration at the time. This was the first of several British productions with oriental subjects, some appearing from other printers such as Stephen Austin. The vogue had probably been sparked by Owen Jones' earlier chromolithographic production, *The Alhambra*. The Vizetelly brothers also produced colour-printed children's books, as well as undertaking work which included colour borders and initial letters in the Gothic style. A good example of the Vizetelly's decorative ornamental printing was the classically styled border work in several colours that was executed for John Murray for Milman's *Horace*.²³

From the Yorkshire business of Benjamin Fawcett, the artist-printer known for his high standards of wood-block printing, came a long list of publications resulting from his collaboration with the Reverend Morris. They have been listed by Ruari and Antonia McLean, who consider that each successive book was characterised by the consistently high quality of the colour plates that illustrated all aspects of a great variety of predominantly natural history topics, including birds and animals, nests, bird's eggs, ferns, grasses, fish and pondlife. (See Plate 2.) From the fifties until the demise of the firm in the eighties, Groombridge of London was Fawcett's main publisher. Many of Fawcett's productions were issued in parts, and Groombridge sometimes re-used plates from a natural history book in the illustrations, for example, for a storybook.

At first Fawcett had used hand-colouring in his plates, but soon began to print in colours from engraved woodblocks with great success. For the 1856 title *A Natural History of the Nests and Eggs of British Birds* alone, Fawcett completed two hundred and twenty three plates, with colouring partly achieved from up to three impressions from the press, but with much still added by hand. The first plates to come from Fawcett's press that were fully colour printed were for *Gems From the Poets* of 1860, followed by *Beautiful Leaved Plants* in 1861, and show that even at this stage, the colour printing was of an exceptionally high standard. Entomology was a special interest of Morris, and the production of the plates for one of Morris' titles on moths was to be the reason for one of Fawcett's only forays into lithography. The forty-one plates published in 1879 for *British Freshwater Fishes* has been acclaimed as a very fine example of woodblock colour printing of the nineteenth century, and is testimony that Fawcett's colour printing standards endured throughout his career.²⁴

Partly because of his success in bringing colour to the nineteenth century mass market, the colour-printed books of Edmund Evans became particularly well-known. Examples of Evans' colour work are to be seen in *Common Wayside Flowers*, (1860) with colour wood engravings of naturalistic flowers by Birket Foster printed alongside the text on the same page. For the 1864 publication of James Doyle's *A Chronicle of England, B.C. 55 – A.D. 1485*, Evans printed eighty engravings in colour, which McLean views as Evans' colour printing "at its very best."²⁵ With both text and illustration on the same page, the effective page layouts exemplified Evans' innate feel for book design. Martin Hardie commented that Evans told him that he himself considered this to have been his most carefully executed book.²⁶

Colour for Some Well-known Periodicals

Under the leadership of Leighton, the firm of Leighton Brothers had begun to produce coloured plates for the *Illustrated London News* in 1855, after the proprietor Herbert Ingram had approached Leighton. Joan Friedman has stated that the first of these, for the Christmas supplement, were "the first plates printed in color to appear anywhere in the field of journalism."²⁷ Ingram had been inspired by the hand-coloured watercolours which had recently appeared in the periodical *Coloured News*. At first the engraved wood designs had been coloured from etched tone blocks, and immediately became so popular that it had been hard to keep up with the demand. This situation apparently caused Ingram to send the plates for publication after only one or two of the colours had been applied, saying the pictures had been printed by a 'chemical solution' process to imply a more expensive aquatint method. By 1858, Leighton was appointed printer and publisher of the *Illustrated London*

News, which continued to contain coloured supplements produced by the modified Baxter colour printing process which he improved until it was superseded by chromolithography in the eighties.

Some of the later colour book work printed at Leightons included *Gems of English Art of the Century*, published by Routledge in 1869 containing twenty-four excellent full-page illustrations which were reproductions in oil colours from woodblocks of pictures from the National Collection. Also in the sixties, the folio volume *Specimens of Colour Printing* appeared, containing "examples of practically every phase of Leighton Brothers' colour work, from reproductions of pictures in the highest style of their art down to purely commercial subjects like tile patterns."²⁸ In the late sixties, *The Graphic* magazine also tapped the market for popular colour. The first issue of this periodical came off the press in London on December 4th 1869, and by the eighties this illustrated journal was providing summer numbers that contained extensive sections of entirely colour-printed illustrations, some executed by adding chromolithographic colour to a basic black and white engraved image transferred to the stone, possibly photographically.²⁹ New Zealand images were among those printed, for instance, those concerning the first European ascent of Mount Cook by two Swiss guides, Ulrich Kaufman, Emil Boss and The Irishman Reverend William Spotswood Green who were forced to turn back within a few metres of the summit.³⁰ Taken from watercolours by Green, nine images appeared as black and white engraved illustrations on a page of the 29th July 1882 issue, for instance one entitled 'The Summit of Mount Cook'.³¹

The New World

In America, in the field of printed reading matter, the periodical literature and newspaper industry had always been the most important side of publishing. But imported magazines such as the *Illustrated London News* were also popular, and it was an Englishman, Frank Leslie, who having emigrated in 1855 to America, began a similar publication there, *Frank Leslie's Illustrated Newspaper*. Soon after, many more magazines including *Harper's Weekly* appeared, the illustrative style of the day often derived from overseas, and reminiscent of perhaps Cruikshank or Doré. As in the old world, wood engravings also became a popular nineteenth century American illustrative medium, especially for the gift books of the eighteen thirties and forties.

European Influences

Elsewhere in Europe colour woodblock printing had been tried in the early part of the century. In France, at the Royal Printing Office, experiments in the twenties had laid the

ground work for the production of the publication *Album Typographique* in 1830, in which the colour work was accomplished by use of three colours, one of which was gold. For illustrative work, wood-engraving, brought to France by Gigoux, who had been one of Bewick's pupils, was becoming common. Between the thirties and the sixties, this was the most popular of several concurrently used media, one in which the vignette appeared prominently. Illustration of the forties was beginning to take on a comic twist,³² with Daumier's satiric work appearing in French magazines such as *Le Charivari*, and Doré's gift for caricature apparent in some of his illustrations such as those for *Rabelais*. Doré, the last of the Romantics, dominated the illustrative scene of the eighteen fifties. Levarie has commented that it was "the great depth of colour—the sudden light areas within the brooding blacks [that gave] his work much of its dramatic vitality."³³ By the middle of the century, German illustrative work had reached a high standard, with such accomplishments as Retzsh's designs to *Faust*, Rowlandson's and Rethel's revival of the *Dance of Death* and Chodowiecki's wood engraving for the biography of *Frederick the Great*.³⁴ It was in Strasbourg that Silbermann was adding colour to graphic work using the wood block technique. In 1840 he produced the above title in four colours, with the text in brown. In Vienna Knöfler used the same technique to print the religious prints for which he became well-known. In 1861, he used twelve colours as well as gold to print a frontispiece for a folio edition of the *Romana Missal*. Later, Knöfler's sons carried on the business, reproducing Old Masters in colour as both single prints and book illustrations. Burch was of the opinion that they were the only printers to have produced chromoxylographs for sale in separate form.³⁵

Other Trends in English Illustration

In England, the satire of Hogarth had been appearing in the thirties in his illustrations for magazines such as *Illustrated London News* and *Punch*. Caricature was a tool used by the essentially English illustrator Cruikshank who was at first a magazine artist but whose large output included his well-known Dickens illustrations, for example those produced for *Oliver Twist*. Notable for the fact that, unlike most illustrators of the time, he etched his own plates, Cruikshank's individual approach, that was "combined with a certain lovable grotesque, ... could give sentient expression to a barrel or a wig-block, a jug of beer, a pair of bellows, or an oyster."³⁶ Hablot Knight Browne, or 'Phiz' as he was known, a popular illustrator especially of the new novels by contemporary writers in that period, and well-known for his Dickens illustration, was also interested in design. Much of his colour work was concerned with sporting themes. Printed in colour lithography by Vincent Brooks, eight of his plates were used, for instance, to illustrate an 1866 book of humorous verse by

Lindon Meadows, *Dame Perkins and Her Grey Mare, or the Mount for Market*.³⁷ Edward Hodnett considers that “he understood and practised better than most English illustrators the art of wedding image and text.”³⁸ In that regard he followed in the steps of Blake, whose *Book of Job* published in 1825, had also exemplified the integration of text with image.³⁹ Later, Aubrey Beardsley, who had been one of the first to pioneer new engraving methods for the representation of tone by means of small patterns for relief illustration, also had developed a distinctive style. Of Beardsley’s illustrations for Oscar Wilde’s *Salome* of 1894, the author is said to have remarked that “they are cruel and evil and so like dear Aubrey who has a face like a silver hatchet with grass-green hair.”⁴⁰

Books from the British Chromolithographers

After Charles Hullmandel’s pioneering efforts to use lithography for full colour printing (see Appendix 2A), other British lithographers followed suit and a host of chromolithographed publications ensued. By the time of European settlement in New Zealand, one of the most famous of the English chromolithographic publications, Owen Jones’ *Alhambra*, a manifestation of the medieval revival, was well underway. However, in spite of its colour printing virtuosity, the *Alhambra* was not successful as a commercial venture, probably because it appealed to a limited, mainly architectural audience.⁴¹ Jones became known for his illuminated gift books, which were inspired by the sumptuous appearance of the old manuscript books in their use of gold and colours, often with text from the Bible. His *Prism of the Imagination* published in 1844 is an example, with both borders and chapter titles decorated in colour and gold, and the illustrations in black and tint. In 1856 his masterpiece, *The Grammar of Ornament* was published.⁴²

Springing from his especial interest in medieval manuscripts, the coloured books produced by Noel Humphreys in the illuminated printing style included *Illuminated Books of the Middle Ages*, which was produced between 1844 and 1849. An example of excellent colour printing, the chromolithography was by Jones and Graf. Considering it one of the best of this class of book, Burch said that “some of the pages in this grand volume are of exceptional beauty, such, for example as the reproduction of a page from the *Hours* of the Duc de Berri, [which is] a veritable triumph of the colour printer’s art.”⁴³ Many of the books produced by the early English chromolithographers *were* works of art, produced as a total design concept. McLean has commented that this period of book production displayed “richness, variety, and idiosyncrasy...that was then the most inventive, tasteful, energetic and powerful in the world.”⁴⁴ Although his books were not of even standard, Humphreys’

achievement was that he brought many innovative and attractive coloured books to the marketplace of print.

Michael Hanhart was another chromolithographer of the early period who advanced the art of chromolithography, as seen in the example *A Booke of Christmas Carols* published by Cundall in 1846. This work, printed by Hanhart at the Chiswick press, contains as frontispiece an example in gold and colour of a miniature reproduced from an old manuscript that was typical of this kind of production. The firm of Day & Son were the influential chromolithographers of the Great Exhibition publication, the 1851-1853 two-volume folio *The Industrial Arts of the Nineteenth Century*, printed to show exhibition items in colour. This was one of their most important works. Joan Friedman has commented that by then it had become clear that chromolithographic printing was the best means available for colour reproduction at the time, and, as demonstrated in these volumes, for such printing “the best printer [was] the firm of Day & Son.”⁴⁵ Publications appearing on the market on the art of chromolithography itself included the journal *The Chromolithograph* also published by Day and Son from 1867 to 1869. (Plate 70.) Burch has stated that the first non-technical British periodical with chromolithographed illustration was claimed to be *The Little One's Own Coloured Picture Paper*, begun in May 1885 by the London firm of Dean and Son.⁴⁶ This was the same year that Richmond's *Colour and Colour Printing as Applied to Lithography* was published in London by Wyman.

Nature Printed Books

After Henry Bradbury had introduced Auer's improved nature printing to England to a receptive response in the eighteen fifties, although it was not used extensively, a few scientific books for which exactness of detail was paramount were published with illustrations printed in this way. The most important of these were the 1857 publication, *The Ferns of Great Britain and Ireland*, and *Nature-printed British Sea-weeds*, which came out in 1859-60. Nature printing for these had proved “ideal for showing the thin two-dimensional fronds of ferns and sea-weed, but less successful with more fleshy plants.”⁴⁷ (See also Appendix 2A.)

Children's Books

The cheaper printing methods pioneered in the nineteenth century by printers such as Edmund Evans had enabled the addition of the element of colour to illustrated children's

Plate 70: 'Peaches and Strawberries' by T. Gronland.

Published in *The Chromolithograph* no.15, 11 July 1868.

By permission of the Alexander Turnbull Library, Wellington, N.Z., New Zealand and Pacific Collection.

Ref. No.: S-L 368-

Peaches and Strawberries, by J. Greenland.

books, a market sector for which colour has been in great demand ever since. It had been by the eighteen thirties and forties that children's books had begun to appear in greater numbers. Publications such as the Peter Parley annuals and Coles' *The Home Treasury of Books, Pictures, Toys, etc. Purposed to Cultivate the Affections, Fancy, Imagination, and Taste of Children* were published, the latter being printed by Whittingham at the Chiswick Press. By mid century children's books were widespread throughout Europe and North America,⁴⁸ and the stories of such well-known authors as the Grimm brothers and Hans Christian Anderson had become established on the market. From the start, colour was attractively employed for book covers and for illustrations, many of which were hand-coloured, although this inevitably raised the cost. The earliest illustrations to have been printed in colour for children's books were for the frontispieces in three books published in 1835 by Darton. The colour for these titles, Mary Elliott's *Tales for Boys* and *Tales for Girls*, and *Caroline Mordaunt*, by Mrs Sherwood, had been printed from wood blocks by Baxter.⁴⁹

For *The Home Treasury* titles, most early illustration, often from the best artists, was printed by lithography, with more of the later illustration accomplished from wood blocks. By the forties, colour printing for this series, also usually from woodblocks, had been introduced, and school-books began to include colour work, especially for covers, while title pages and opening pages were sometimes enhanced in this way. At this time, the firm of Gregory, Collins and Reynolds were prominent in children's publication colour printing. An example of their work was the colour printed paper cover for *The Playmate*, a children's monthly magazine, which began in 1847. In the 1860s and 70s, colour printing for children's books became more common with the popularity of the Toy-Books, that were analagous to modern picture books. Although the Toy-Books of the period are not dated, Percy Muir names Routledge as the first publishers of such books, and *The Railroad Alphabet*, published in 1865, as probably the first title, although the *Farmyard Alphabet* appeared at about the same time. Profits were dependent on the popularity of these books: for a typical edition "ten thousand had to be printed to make it a commercial proposition and even then the return to all was exceedingly small."⁵⁰

Edmund Evans engraved especially for the children's book market, and his colour method came into wide use, mainly for books where his essential simplicity of style was found most appropriate. Evans is famous for the production of Toy-Books, which were frequently illustrated in printed colour executed using the relief wood block method. These books are well-known for their illustrations from drawings chiefly made by the artists Walter Crane,

Randolph Caldecott and Kate Greenaway, and it is the character of these illustrations which give the Toy-Books their graphic quality.⁵¹ Having a gift for achievement of great effect with an economy of detail, Caldecott was recognised for the particularity of his humour. Percy Muir has said that his 1879 colour illustration for Goldsmith's parody of funereal poetry, *An Elegy on the Death of a Mad Dog* from *The Vicar of Wakefield*, is one of the most brilliant that appeared in his series of Toy-Books, asserting for instance, that his "drawing of the dog posed against wooden palings on waste land is one of the best things he ever did in colour."⁵² This had been created for the fourth book of the series. The work of Greenaway had a freshness and appeal which was suited to the medium, while Crane's decorative colour work, which reflects the influence of the Aesthetic Movement, and also of Japanese art, especially the Japanese woodblock prints, is often seen at its best in the early Toy-Books. In the latter, in which large areas of flat colour were employed, special attention was paid to the harmony of the page.

It has been observed that the works of Shakespeare have been the all time best money-spinners for book publishers as they were produced in successive editions over the centuries. They have been truly international best sellers. In the twentieth century, when publishing proceeded in general along more nationalistic lines, it is interesting that it was the field of children's literature that remained more international in nature.⁵³ Also from the twentieth century the application of colour printing began to increase with the proliferation of children's picture books. In this genre the integration of text and often coloured illustration was occurring to stimulate interest in the printed page from an early age. At the beginning of the century, Arthur Rackham, who from the 1890s had been solely a book illustrator, was well-known for his use of colour and silhouette especially in children's book illustration. Leonard Brook was also at work illustrating for children's titles, including those of Edward Lear. The Beatrix Potter books, which were both written and illustrated by the artist, were uniquely designed to a scale suited to the child, and featured true-to-life colour illustrations that were fully integrated with the text. The Beatrix Potter series, which began in 1900 with *The Tale of Peter Rabbit*, continued until 1930, and had affinities with the English water-colour tradition. These books were well-known examples of this genre from the illustrative period of the early twentieth century.

Illustration and the Photomechanical Revolution

In spite of the proliferation of variant processes based on all three of the major printing methods, intaglio, lithography and relief, in fact it had been the relief woodblock techniques employed for book illustration that had facilitated the printers' ability to economically bring

printed images to the mass market during the course of the nineteenth century, and it was through the connection of photography with the relief processes that in the last decades of that century the photomechanical revolution first allowed a complete change in the way book illustration in the Old World was accomplished. Throughout the sixties and seventies illustrative images had been largely printed from relief after the first introduction of line cut and of experimental halftone images. However, it was the adoption of the half-tone screen from the eighteen eighties, because of its inherent ability to represent tonal contrasts, that eventually was to bring the greatest changes to book illustration. (See Appendix B.)

Since the forties the fruits photography had threatened to replace other forms of graphic representation and this potential had been feared by artists. However, art still held the trump card: colour. Writing in 1842, a *Spectator* author commented: "the artist cannot compete with the minute accuracy...of the Daguerreotype but...not all the delicate truth of the photographic delineation can supply the want of colour. By imitating the local colour and atmospheric effect alone can landscape painters hope to stand against such a formidable rival as Nature."⁵⁴ It was not until the sixties that some of the very early, albeit impermanent, natural colour photographs had appeared. It has been said that in the face of such a threat, "the apparent dichotomy in Impressionistic painting between its photographic accuracy of tone and its more arbitrary colour and brush-work may well have reflected the general artistic dilemma resulting from the progress of photography."⁵⁵

It is ironic that in the last decades of the nineteenth century, during the transition to photomechanical reproductive techniques, there seemed to be fewer examples of fine illustrations to be found. Contributions from French artists, such as etchings by Manet, Alphonse Legros and J.L. Forain, and lithographs by Manet, Redon and Toulouse-Lautrec, although occasional, exemplified the best standards of the time.⁵⁶ Under influences such as that of the Japanese print, and the entrepreneurial efforts of Ambroise Vollard, who was an individual of inspiration and vision, the book again began to be enriched by artists, and from the late eighties a major revival in colour printing began in France. Vollard, a French art dealer and publisher, encouraged many of the best artists of the day to participate in the publication of illustrated books. In the last years of the nineteenth century, new specialist magazines were coming out and some of these, such as *L'Estampe et L'affiche*, encouraged the trend for colour as well.⁵⁷ In 1889 the French Society of Printers and Engravers had been formed with the aim of improving standards by stimulating the interest of the best artists in book illustration. It has been said that "the sheer style of these artists was refreshingly new, but their use of the page was even newer, and broke all the boundaries of the past."⁵⁸

In France it had been the artist Manet who began the trend towards a unification of text and illustration. The 1875 production of Mallarmé's translation of Poe's *Raven*, illustrated with Manet's "free full-page lithographs, completely separate from the printed text but deeply interpretive of its mood" was an example.⁵⁹ Between them artists began to use the gamut of graphic means in the service of illustration, although at this time avoiding the current illustrative quality of photographic reality. It was to be at a later time, in the twentieth century, that the photograph was to become but another element that fuelled the imaginative fire. The surrealists in particular were to make use of the photographic look, but twisted to achieve new effects.

Later in the nineteenth century, the pre-Raphaelite Arts and Crafts movement centred about William Morris reacted to the lowered standards that were seen to be a consequence of the march of industrialisation. Inferior print quality, perceived to be due to new methods of book production for the mass market, was deplored. Working to restore art and beauty to everyday life, Morris and his artist friends employed their own art and craftsmanship to produce a wealth of products including furniture, fabrics and wallpapers. It is a tribute to their appeal that many of the Morris patterns are still available today. In the nineties, inspired by the appearance of fifteenth century books, Morris carried his convictions into the area of fine printing when he founded the Kelmscott Press, aiming to produce books that were unified works of art, with text and illustration integrally related. William Morris said of illustration in general that it should be "the most harmonious decoration possible to the printed book."⁶⁰

Morris had printed the illustrations for his own Kelmscott Press publications by means of relief blocks, and his last production, the 1896 folio edition of the *Works of Chaucer* is now viewed as one of the great books from the English private press movement. Set in gothic style type, this book was decorated with black-ground vine-leaf borders by Morris and with woodcut illustrations by Burne-Jones. However, Levarie considers that it was the Ashendene Press, founded in 1894, that probably came closest to producing books with the "actual appearance of incunabula", due not only to the use of heavy types, vellum as the printing substrate, and book design that included the wide margins of handmade paper, but also, tellingly, because of their completion in colour: "rubrics in red, blue and gold."⁶¹

British Colour Printing and International Illustration Trends to 1914.

In any period, as publishers have made attempts to meet market demands, and at the same time contain costs in a competitive environment, quality has often suffered in the effort to deliver more for the money. The twentieth century was no exception. To counter the

tendency towards a lowering of standards, the focus was on all elements of book design, and this included a new emphasis on the element of colour. In the twentieth century, the recognition of the centrality of the role played by print materials as both a mirror of culture and a shaping influence coloured the new view of print culture that was emerging. Part of this was that the book began to be seen not only as "more than a triumph of technical ingenuity, but as also one of the most potent agents at the disposal of western civilisation in bringing together the scattered ideas of representative thinkers."⁶²

At the beginning of the century, Ambroise Vollard was facilitating the incorporation of the products of some of the most creative minds into books. In the year 1900 itself, Vollard published Verlaine's *Parallèlement* with one hundred and eight lithographs printed in rose-sanguine by Pierre Bonnard, who was said to have "composed them on the printed page with rare harmony and tonal delicacy."⁶³ Levarie said of them: "They were as light and fresh as if they had been drawn in soft red crayon on the cream-coloured handmade paper."⁶⁴ This fine book has been described as epoch-making. Just as the ways between the artist and the book publisher and printer seemed to be parting due to the advent of the photomechanical revolution, the unexpected happened. Because of the determination of a single individual to raise the standard of the illustrated book, at one and the same time the cause of both art and book was furthered. The result was "the most important characteristic of twentieth century illustration: the massive contribution by famous artists to a large number of books."⁶⁵ By this means the late nineteenth century revolution that had occurred in painting had also become the means of changing the illustration and layout of books. An important ingredient in the change was the element of colour.

The impressive list of painters contributing to book illustration included such names as Chagall, Derain, Degas, Dufy, Rouault and Picasso. It was not long after the turn of the century that Pablo Picasso's first collection of paintings, many from his so-called Blue period, was hung at Vollard's, during the Spanish painter's second visit to Paris in 1901. In time, Picasso was to become one of the most prolific of the artists whose work appeared as illustrations in twentieth century books, the inherent graphic quality of his work lending itself to that purpose. Although "Paris had excited Picasso into an exaltation of color"⁶⁶ in the manner of the Fauves, the phase did not last long and his work began to shift emphasis, increasingly becoming more schematic and clearer in design with the colour applied in large flat planes in blue, mauve or green. Much book illustration by French painters was in black and white, but colour printing processes were becoming equal to the task where expression in colour was required. The vocabulary of colour was part of the forceful technique of the

Fauves, led by Henri Matisse from around 1910 onwards, as they strove to “express the dynamic energy of modern life.”⁶⁷ From this time Rouault had used combination intaglio techniques for his powerful colour prints. For example, intense colours were used in the etching ‘Le Cirque de L’étoile Filante’ to depict clowns and acrobats. Rouault provided his own text for this work. Also in France the Imprimerie Nationale printed many fine books for both commercial and private publishers in the twentieth century.

Around the turn of the century, continental printers, for instance, the French firm of Lemercier in Paris, the Dutch firm of Emrik & Binger in Haarlem, and Nister of Nurmenburg in Germany, had “fairly consistently” supplied plates for English publications.⁶⁸ Ordinary chromolithography had waned in England during the first decade of the twentieth century, whereas in France it was still an important means of colour printing for limited editions, for which the expense was justifiable, because the market was, unlike in Britain at the time, willing to pay. A notable production of this era was *Les Aventures du Roi Parisole*, published by Blaizot in Paris in 1906, which contained eighty-two chromolithographs integrated into the layout of the text page. Designed by Pierre Vidal, these, as well as the handsome borders and fine initials, were all in colours. At this time book-covers were also often printed in chromolithographic colours.

Colour printing had disappeared in England from around 1894 from the cheaper magazines, but re-emerged when web-feeding processes enabled costs to be cut, making it viable once more. In America, rotary presses had been in use for the printing of colour from stereotyped half-tone blocks for newspapers since 1888, the Christmas numbers of the *New York Herald* and the *Journal* carrying colour supplements that had come from the press at 48,000 copies per hour. The *Boston Post* had also featured colour in its Sunday editions. In Europe, colour was part of some of the weeklies such as *Petit Journal* in Paris, and *Simplicissimus* in Munich, but at the time, colour work of the kind was absent in Britain. Although *Coloured Pictorial* had appeared in 1902, it had been of a poor standard, and soon died. Thus, not until Harmsworth’s *Puck* appeared in 1904 from the London Printing Company, “printed from the web on rotary machines in four colours, from nickel-faced line blocks,”⁶⁹ did colour return to the periodical literature. Also published by the same company, the *Daily News* had contained colour by 1910: it had been used for a political chart printed in red and green and black. However, it was not to be until the years after the first World War that the great period of news photography began, but, partly because of technical limitations, even at this time illustration was largely seen as ancillary to the text.

As the photomechanical revolution gathered pace in the early twentieth century, coloured halftones were being commonly used for book illustration, and in combination with trichromatic colour principles and the use of papers with suitably treated surfaces, had resulted in reproductive methods that gave "a wide color palette with the colors appearing bright and true to the original."⁷⁰ During the twentieth century there were many improvements and refinements, as application of this method widened, until the introduction of the computer in the late twentieth century brought a new revolution to the printing industry, including to colour printing. However, it was to be the trichromatic halftone that was to continue in use right into the late twentieth century for the few books still printed by relief methods by then.⁷¹

Prints in Colour

Britain in a European Context

Much early experimental colour printing had resulted from efforts to create colour reproductions of the great works of art. One of the influential English printers working towards this cause in the earlier part of the nineteenth century had been George Baxter. (See Appendix 2A.) It appears that Baxter had produced a print of three butterflies in seven colours by 1830, a feat that heralded the main direction his work was to take, as Baxter's major output was destined for the print market. His first dated colour prints had appeared on the market in 1834, and after that many were published as separable components in books, often as frontispieces. Of the 376 prints that Baxter made, R.M. Burch stated that the finest was considered to have been the 'Coronation' print published in 1842 to commemorate Queen Victoria's June 1838 coronation: it was considered remarkable for its fine detail and accuracy. Its purchase price was £35 for a colour printed copy, or between £10 and £15 for a copy in sepia only. It was for his colour prints that Baxter became famous, as their desirability lay both in the fact that the appearance of the colour was akin to that of painted colour and that they could be acquired for much less than the cost of an original.⁷² Through his printing technology, Baxter had laid the foundation for the dissemination of prints created from great works of art to a much broader audience. The standard of the reproductive prints he was able to bring to the mass marketplace fuelled a growing realisation that ownership of low cost but faithful copies had been brought within the reach of the many. As a consequence, such images were no longer able to be confined to speaking only to the few privileged enough to afford them. This had been an express aim of George Baxter, who had wished to allow the general public to acquire a means of becoming familiar with the art works of the masters.⁷³

In the second half of the nineteenth century, the Arundel Society was a body which was also concentrating on the use of colour printing as a means of bringing art reproductions to the wider popular market. This body was responsible for much well-known chromolithographic work, especially for the series of 197 reproductive prints of early Italian frescoes, for which the colour printing was partly undertaken in England and partly in Germany. These prints had been importantly influential in bringing reproductions of great works of art into the mid-Victorian home.⁷⁴ That Baxter had not used chromolithography as a reproductive process was explained by his biographer, C.T. Courtney Lewis as being because he had considered it to have been "quite unequal to 'fine productions', owing to its utter impossibility to enter into the minutiae of any subject." In consideration of Baxter's development of the relief processes for his colour printing, Courtney Lewis recalled the comment of Robert Mudie, who had said in the preface to the 1834 *The Feathered Tribes of the British Isles*,⁷⁵ the first book in which colour plates by Baxter appeared: "in carrying this very beautiful branch of the typographical art successfully into effect, Baxter has, I believe, completed what was the last project of the great Bewick, but which that truly admirable genius did not live to accomplish."⁷⁶

For colour printed images created from the later relief processes, engraving techniques had needed to be adapted from wood engraving to be suited to the new mechanical line-cut process blocks, but this took time. Aubrey Beardsley, who was associated with the beginnings of the Art Nouveau reaction to industrialized England, was one of the first to experiment with the new engraving techniques that were required for making relief prints in the line block era, especially for the representation of tonal contrasts, for which he began to use textured patterns such as small dots. Later, with the introduction of three colour relief methods, new ways of making reproductive colour prints were pioneered. Some three-colour prints shown in 1891 by the firms of Angerer & Goschl of Vienna and Albert of Munich were early examples of images produced in this way. Other new colour methods resulted from innovative planographic processes such as collotype, while still later, the introduction of photogravure produced other new options suited to the production of quality prints. Examples of early colour collotypes were those that were printed in England by Waterlow and Son for the periodical *Land and Water* in 1890-91, a good example being one that depicts a yachting scene in the August 1890 issue.⁷⁷

In 1898, an excellent series of reproductions of paintings from the Old Masters, also colour collotypes, was brought out in 1898 by the Medici Society of London. While such collotypes possessed the advantage of almost perfect tonal representation, they were

expensive to produce, a disadvantage in a marketplace by then expecting cheaper colour. By the early twentieth century, colour prints that had been printed from a variety of processes were available, but as the halftone proved its worth, gradually prints produced from the three and then four-colour relief processes began to become more common in the commercial sphere. The first known three-colour gravure print to have been produced in a long run was on the market by 1906, and, according to Otto Lilien, the historian of gravure, depicted "a landscape with a birch tree."⁷⁸ (Plate 71.) Printed via photogravure by the Rembrandt Intaglio Printing Company, other such prints, which were large reproductions of paintings, soon followed. Also appearing a little later in the northern hemisphere were prints produced using the new offset lithography which was to become a major means of twentieth century commercial colour print production.

Artists' Prints

As the photomechanical revolution in printing had gained pace, one of the results was that by the turn of the century the separation of the artist from the commercial side of the printing industry was becoming greater, especially in the area of colour printing. Commercial colour printing processes were becoming so complex that the artist was being precluded from any effective role in the production environment.⁷⁹ It was partly this situation that had begun to cause the artistic community to vigorously pursue experimentation in the autographic processes. This was their home territory. As a means of controlling and preserving value in a marketplace where commercially produced prints were increasingly satisfying the mass demand they were both creating and feeding, the idea of the "original print" was introduced, coupled with the practice of destroying the true original, the plate, after a limited edition of images had been printed. New interest among artists was being kindled in methods of making colour prints, and this led to the exploration of some innovative methods. In France, Toulouse-Lautrec had been influential in bringing colour on the poster to the fore once again, his hallmark being an extension of the use of the range of colours from the, by then, usual range of only three. The poster became a popular European medium as other artists followed suit during the nineties, using the genre for the exploration of textual colour printing. It was the same artist who also spurred the revival of French colour lithography. The first colour print that he made that was not a poster was the 1893 lithograph 'Miss Loïe Fuller' for which, in some impressions, he had used metal dust for the highlights in the Japanese manner. New to the west was his use of large areas of flat colour and his unusual use of pattern in conjunction with the avoidance of heavy shading.⁸⁰

Artists such as Redon, Whistler and Signac also began to produce colour lithographs. Notable examples from the time were, for instance, the lithographic prints 'Some Aspects of Life in Paris', a series of twelve made in 1899 by that supreme colourist, the French artist Pierre Bonnard. Other artists, for instance Mary Cassatt, were again using intaglio print techniques, while still others, including Gauguin and Norwegian artist Munch, who, much influenced by the Japanese style, turned again to the woodcut to achieve bold effects in simple colour statements. Munch worked out an "innovative technique [that] involved the division of the pine-wood plank into separate pieces corresponding to each colour. A second block with the design in black outline was then superimposed."⁸¹ This artist also employed combination techniques, producing colour effects by both woodcut and lithography in a single work, seen for example in his six colour 'Vampire' of 1895. Based on a painting, Munch's famous 1893 lithographic print 'The Cry' has been cited by Frank and Dorothy Getlein as being "a classic image of extreme emotion expressed directly" in which "the pervading causes of the scream and its continuing echo are expressed in the swirling lines."⁸² Ironically the chosen means of expression of such direct emotional utterance was the "once removed" medium of print. Although this may be seen as a condition that possibly dilutes its communicative impact, nevertheless, through its ability for dialogue with the many rather than the few, through its potential for wider communication, in another sense its power was increased.

Colour Printed Maps

Charles Knight's 'Illuminated' colour printing method was first used for book work to print twenty coloured maps for Hughes' *Illuminated Atlas of Scripture Geography*, which was published by Knight in 1840. (Plate 72.) Each map was produced from around eight blocks. Knight's most elaborate maps appeared in the 1844-45 *Old England* (twenty-four) and in *Old England's Worthies* of 1847 (twelve).⁸³ Some of the French printers, including Engelmann, had experimented with lithographic colour printing in the twenties and thirties,

Plate 71: 'A Landscape With a Birch Tree.'

The first known three-colour gravure print to have been produced in a long run.

On the market by 1906, it was printed via photogravure by the Rembrandt Intaglio Printing Company.

Reproduced in Otto M. Lilien, *History of Industrial Gravure Printing up to 1920* (London: Lund Humphries, 1972), 51.

By permission of the State Library of Victoria.

Plate 72: 'The Kingdoms of Judah and Israel with Part of Phoenicia from an Original Drawing by W. Hughes.'

One of Charles Knight's patent illuminated maps, thought by Geoffrey Wakeman to have possibly been printed from the blocks for W. Hughes' *Illuminated Atlas of Scripture Geography*, and was used in John Kitto's *The Pictorial Sunday Book*, [1855].

Reproduced in Geoffrey Wakeman, *The Production of Nineteenth Century Color Illustration* (Loughborough [Eng.]: Plough Press, 1976), 3.

By permission of the State Library of Victoria.

Scale of English Miles.

0 5 10 15 20 25 30 35 40

Ancient Names are inserted in Roman Letters.
Modern.....do.....Italians.....do.

EXPLANATION OF SIGNS.

o Is used to indicate a Town the ancient situation of which is ascertained.
□Is considered as only probable.

—VIZITATIS—

Plate 72

and after this the technique became more widespread: it is known that by 1845 in Paris around eighty lithographic presses were printing in colour. A proportion of this colour was being applied to maps. By 1843 a geological map, the 28 x 35 inch 'Carte Geonostique du Plateau Tertiaire Parisien', for which Victor Raulin had been compiler, was produced in eleven colours applied from four impressions, each successive colour being printed on top of the last. Soon after this it was evident that colour printing for maps was underway at the Imprimerie Royale, an example being the 'Feuille d'Assemblage de la Carte Geologique de la France' which was printed around 1845 in twenty-three colours by the chief lithographer, M. Derenmesnil.⁸⁴

Colour lithography had spread early to the United States. In the eighteen forties, the printer Peter Duval of Philadelphia, whose output included many maps, was experimenting with colour lithography. Duval, in partnership with Richards, is also known for having introduced a rotary steam press into his plant in 1849, and for his pioneering work in zincography. American knowledge of lithography had been gained from both France and Germany and had been used in official mapping agencies in the early decades of the nineteenth century. This included the production of government maps from at least the late twenties onwards, although many maps were also produced by intaglio methods right up until the Second World War. However, by that time, "the image was usually transferred from copperplates to stone or zinc for the printing process."⁸⁵

With the more general introduction of the power press in the second half of the nineteenth century, the ability to produce electrotypes allowed wax engraving to be used to manufacture more robust plates that would stand the longer runs. This became an important commercial process, especially in America in the second decade of the twentieth century, allowing the costs for map making to be cut by as much as ten times, especially for long runs, so that reference atlases were able to become affordable school and household items. David Woodward considers that the process did enable extra clarity of line, but that it was the comparative lack of specialist cartographic knowledge that contributed to "a dramatically less sophisticated cartographic style in the United States when compared to European cartography in the same period."⁸⁶ However this process was not used for short run items such as the United States Geological Survey topographic quadrangles, or for the production of county atlases: these maps continued to be produced from either direct lithography or from transfer lithography for which existing copper engravings were transferred to lithographic stones and plates.⁸⁷

Ephemera Britain

Michael Twyman has observed that it was the growth of industry and trade that was responsible for the “sudden growth of printing in Britain in the last two hundred years”:

The reorganisation of English manufacturing from cottage-based industry to centralised factories in urban areas brought with it a society much more dependent on organised commerce, and created a demand for new kinds of printing. Large firms needed printing in order to identify, describe, and advertise their products, and labels, trade catalogues, and circulars were printed in lengths of run previously required only for newspaper and periodical work. The organisation of trade involved correspondence and accounting, and this created the need for letter-heads...and other business printing which had in the past only been written by hand. In its turn the expansion of business and trade conducted on a national and international level necessitated the printing of postage stamps, cheques and reliable paper currency.⁸⁸

Up until 1840 the bulk of printing in Britain, particularly letterpress printing, had been accomplished with black ink, but it was in the early eighteen forties, around the time that newspaper printing was beginning in New Zealand, that colour printing began to be more commonly applied to such items of everyday printing as posters. By the time of the Great Exhibition, British colour printers were producing a range of print products, many of which were on view at that event, and many of which serviced the event itself, in the form of such items as souvenirs and handbooks.⁸⁹ Much detailed information concerning northern hemisphere items of this nature appears in Maurice Rickards' *The Encyclopedia of Ephemera: A Guide to the Fragmentary Documents of Everyday Life for the Collector, Curator and Historian*, which, edited and completed by Michael Twyman with the assistance of others, was published in 2000. (Literature Review: 26.)

With the transportation of printing to both Australia and New Zealand came the possibility of producing print products in the Antipodes similar to those the British printers had brought to the marketplace of print, many printed in colours. In time, as industries were established in nineteenth century Australasia, the printers were called on to provide many of the same items as those that were required to service the needs of business and industry in the Old Country. After the introduction of the technology of colour printing in Australia and New Zealand, the possibility was present for local printers to add printed colour to products such as the posters, programmes, catalogues, food labels, postage stamps and cards that were also required in the Australasian marketplace of print. Questions surrounding such production have been explored in chapters 3-12 of the present thesis.

¹ Ruari McLean, *Victorian Book Design and Colour Printing*, 2nd ed., enlarged and revised (London: Faber, 1972), 2.

² T.M. MacRobert, *Fine Illustrations in Western European Printed Books* (London: Her Majesty's Stationery Office, 1969), 12.

³ Norma Levarie, *The Art & History of Books* (New York: Da Capo Press, 1982), 257.

⁴ Ruari McLean, 'Early British Coloured Books', in *The Penrose Annual*, 73 (1981): 227-228.

- ⁵ Stanley William Hayter, *New Ways of Gravure*, with a preface by Herbert Read, [rev.ed.] (London: O.U.P., 1966), 196.
- ⁶ McLean, *Victorian Book Design and Colour Printing*, 34.
- ⁷ Michael Twyman, 'The Emergence of the Graphic Book in the 19th Century', in *A Millenium of the Book. Production Design & Illustration in Manuscript & Print 900-1900*, ed. Robin Myers & Michael Harris (Winchester: St. Paul's Bibliographies, 1994), 162.
- ⁸ Roy Porter, 'Reading is Bad for your Health', in *History Today*, 48 no.3 (March 1998): 11-16.
- ⁹ Kenneth Clark, *The Gothic Revival* (1928), in *The Oxford Companion to Art* (New York: Oxford University Press, 1970; 1995), 495.
- ¹⁰ Augustine Hope and Margaret Walch, introd. by Michel Pastoureau, *The Color Compendium* (New York: Van Nostrand Reinhold, c1990), 57.
- ¹¹ Michael Twyman, *Printing 1770-1970: An Illustrated History of its Development and Uses in England*, 1970; reprint, with a new foreward by Ruari McLean and an additional bibliography (London: British Library, 1998), 37.
- ¹² Levarie, *The Art & History of Books*, 257.
- ¹³ Twyman, 'The Emergence of the Graphic Book in the 19th Century', 158.
- ¹⁴ Percy H. Muir, *Victorian Illustrated Books* (London: Batsford, 1971), 152, citing Charles Thomas Courtney Lewis, *George Baxter (Colour Printer): His Life and Work: A Manual for Collectors* (London: 1908).
- ¹⁵ John Feather, *A Dictionary of Book History* (London: Croom Helm, c1986), 21.
- ¹⁶ McLean, *Victorian Book Design and Colour Printing*, 38.
- ¹⁷ *Ibid.*, 39.
- ¹⁸ Muir, *Victorian Illustrated Books*, 52.
- ¹⁹ McLean, *Victorian Book Design and Colour Printing*, 66.
- ²⁰ R.M. Burch, *Colour Printing and Colour Printers* (London: I. Pitman, 1910), 138.
- ²¹ McLean, *Victorian Book Design and Colour Printing*, 42.
- ²² Burch, *Colour Printing and Colour Printers*, 144.
- ²³ Martin Hardie, *English Coloured Books*, with an introduction by James Laver (London, 1906, reprint, Totowa, N.J.: Rowman and Littlefield, [1973]), 286-287.
- ²⁴ Ruari and Antonia McLean, *Benjamin Fawcett: Engraver and Colour Printer: With a List of his Books and Plates* (Aldershot: Scolar, c1988), 9.
- ²⁵ McLean, *Victorian Book Design and Colour Printing*, 184.
- ²⁶ Hardie, *English Coloured Books*, 270.
- ²⁷ Joan Friedman, *Color Printing in England, 1486-1870: An Exhibition, Yale Center for British Art, New Haven, 20 April to 25 June 1978* ([New Haven]: The Center, c1978), 30.
- ²⁸ Burch, *Colour Printing and Colour Printers*, 149.
- ²⁹ *The Graphic: An Illustrated Weekly Newspaper* (London: Edward Joseph Mansfield, 1 no.1 (December 4th 1869-)).
- ³⁰ Alexander Turnbull Library, Exhibition, sponsored by the Goethe Institute of Wellington, curated by M. Minson, 'From George Forster to Denis Adam: 200 Years of German-New Zealand Connections', December 2001.
- ³¹ Alexander Turnbull Library, Drawing and Prints, item: ref: C-068-002.
- ³² MacRobert, *Fine Illustrations in Western European Printed Books*, 12.
- ³³ Levarie, *The Art & History of Books*, 262.
- ³⁴ MacRobert, *Fine Illustrations in Western European Printed Books*, 12-13.
- ³⁵ Burch, *Colour Printing and Colour Printers*, 167.
- ³⁶ Harold Osborne, ed., *Oxford Companion to Art* (New York: Oxford University Press, 1970; 1995), 293.
- ³⁷ Hardie, *English Coloured Books*, 219.
- ³⁸ Edward Hodnett, *Image and Text: Studies in the Illustration of English Literature* (London: Scolar Press, 1982), 165.
- ³⁹ Levarie, *The Art & History of Books*, 269.
- ⁴⁰ *Ibid.*, 273.
- ⁴¹ McLean, *Victorian Book Design and Colour Printing*, 80.
- ⁴² Burch, *Colour Printing and Colour Printers*, 206.
- ⁴³ *Ibid.*, 189.
- ⁴⁴ McLean, 'Early English Coloured Books', 237.
- ⁴⁵ Friedman, *Color Printing in England, 1486-1870*, 55.
- ⁴⁶ Burch, *Colour Printing and Colour Printers*, 210.
- ⁴⁷ University of Delaware Library, *Color Printing in the Nineteenth Century*, 'Nature Printing'.

URL: <http://www.lib.udel.edu/ud/spec/exhibits/color/>

- ⁴⁸ Feather, *A Dictionary of Book History*, 65.
- ⁴⁹ McLean, *Victorian Book Design and Colour Printing*, 58.
- ⁵⁰ Muir, *Victorian Illustrated Books*, 161.
- ⁵¹ McLean, 'Early English Coloured Books', 236.
- ⁵² Muir, *Victorian Illustrated Books*, 169.
- ⁵³ S.H. Steinberg, rev. by John Trevitt, *Five Hundred Years of Printing*, 4th ed., (London: British Library, 1996), 202.
- ⁵⁴ Osborne, ed., *Oxford Companion to Art*, 865.
- ⁵⁵ *Ibid.*, 865.
- ⁵⁶ MacRobert, *Fine Illustrations in Western European Printed Books*, 13.
- ⁵⁷ Laura Suffield, 'Prints', *The Dictionary of Art*, ed. J. Turner (London, Macmillan, 1996-), 25, 623.
- ⁵⁸ Levarie, *The Art & History of Books*, 281.
- ⁵⁹ *Ibid.*, 265.
- ⁶⁰ Hendrik D.L. Vervliet, ed., *The Book Through Five Thousand Years: A Survey by Fernand Baudin [and Others]*, introduced by Herman Liebaers; afterword by Ruari McLean (London: Phaidon, [1972]), 455.
- ⁶¹ Levarie, *The Art & History of Books*, 274.
- ⁶² Joseph Rosenblum, *A Bibliographic History of the Book: An Annotated Guide to the Literature* (Metuchen, N.J.: Scarecrow Press, 1995), 14.
- ⁶³ Eleanor M. Garvey, *The Artist & The Book, 1860-1960: In Western Europe and the United States*. [Introd. Philip Hofer; cat. Eleanor M. Garvey.] (New York: Hacker Art Books, 1982), 26.
- ⁶⁴ Levarie, *The Art & History of Books*, 281.
- ⁶⁵ MacRobert, *Fine Illustrations in Western European Printed Books*, 13.
- ⁶⁶ Denys Chevalier, *Picasso: The Blue and Rose Periods*, [translated from the French by Stephanie Winston] (New York, Crown Publishers [1969]), 35.
- ⁶⁷ Levarie, *The Art & History of Books*, 294.
- ⁶⁸ Geoffrey Wakeman, *The Production of Nineteenth Century Color Illustration* (Loughborough [Eng.]: Plough Press, 1976), 14.
- ⁶⁹ Burch, *Colour Printing and Colour Printers*, 242.
- ⁷⁰ University of Delaware Library, *Color Printing in the Nineteenth Century*, 'Photomechanical Processes'.
- ⁷¹ Feather, *A Dictionary of Book History*, 72.
- ⁷² Burch, *Colour Printing and Colour Printers*, 125-128.
- ⁷³ Courtney Lewis, *George Baxter (Colour Printer): His Life and Work: A Manual for Collectors*, 39.
- ⁷⁴ Twyman, *Printing 1770-1970*, 93.
- ⁷⁵ Colin Clair, *A History of Printing in Britain* (London: Cassell, 1965), 235.
- ⁷⁶ Courtney Lewis, *George Baxter (Colour Printer)*, 34-35. Gives the same quotation, but amends the source cited by Colin Clair to being the preface to *The History of the British Birds* (1834).
- ⁷⁷ Burch, *Colour Printing and Colour Printers*, 227.
- ⁷⁸ Otto M. Lilien, *History of Industrial Gravure Printing up to 1920* (London: Lund Humphries, 1972), 52: reproduction in colour, 51.
- ⁷⁹ Twyman, *Printing 1770-1970*, 47.
- ⁸⁰ Osborne, ed., *Oxford Companion to Art*, 667.
- ⁸¹ Suffield, 'Prints', *The Dictionary of Art*, 25, 624.
- ⁸² Frank and Dorothy Getlein, *The Bite of the Print: Satire and Irony in Woodcuts, Engravings, Etchings, Lithographs and Serigraphs* (New York: C.N. Potter, [1963]), 254.
- ⁸³ Wakeman, *Victorian Book Illustration*, 43.
- ⁸⁴ Walter W. Ristow, 'Lithography and Maps, 1796-1850' in David Woodward, ed., *Five Centuries of Map Printing* (Chicago: University of Chicago Press, 1975), 97.
- ⁸⁵ *Ibid.*, 110-111.
- ⁸⁶ David Woodward, 'Maps, Music and the Printer: Graphic or Typographic', in *Printing History* (1986): 12.
- ⁸⁷ *Ibid.*, 11.
- ⁸⁸ Twyman, *Printing 1770-1970*, 14.
- ⁸⁹ *Ibid.*, 45-46.

COLOUR PRINTING STANDARDS IN BRITAIN.

Britain

19th Century Theory and Practice

John Southward and W.D. Richmond

Writing in 1882, John Southward emphasised that for the attainment and maintenance of standards, it was important for the printer himself to have knowledge of contemporary colour theory as it connected to what was known of the visual system and its application to printing. In his book, *Practical Printing: A Handbook of Typography*, originally published as a series of articles in *Printer's Register*, the treatment of colour printing was given much more than cursory coverage, indicating the wealth of knowledge in the field by this time. Robert Coupland Harding mentioned in *Typo* that he regarded this work as "the best printers' handbook in the English language."¹ Several chapters were devoted to the practicalities of colour printing, covering such topics as 'Theory of the Harmony of Colours as Applied to Printing', 'Choice and Arrangement of Colours', 'Manufacture of the Inks', and 'Method of Colour Printing'. There was also a separate chapter on 'Printing in Gold'. Southward's discussion of the subject of colour printing in this manual began with the principles governing the harmony and contrast of colours as it applied to printers' inks and their suitability to specific jobs. Southward's intent was twofold; firstly to impart practical information and secondly the knowledge required in order that "the young printer may understand the scientific principles upon which this beautiful art depends." His purpose for the printer went further:

An acquaintance with [principles] will afford him the satisfaction of knowing why a certain form or style is adopted, will give him confidence in his work, and will often save him from blunders and anachronisms which would immediately betray his ignorance of the theory of the art he practises.²

Southward's detailed discussion covers the gamut of predictable visual effects to be expected from coloured printer's inks as they were deployed in different ways. These included the effects of specific juxtapositions of colour; the additive mixing of the three primary pigment colours; the secondary colours; the complementary colours; tones, tints, hues and shades; and the relative permanence to be expected from inks of the time.

Since the printer's art relies for effect on the perception of the finished result, knowledge gained by experience of how the arrangement of colours affects the way they are perceived is essential. Experience concerning the behaviour of printer's inks is partly specific to the pigments in the particular inks, but partly can be drawn in a general way from a basic

knowledge of how the eye perceives colour, including the effects on sensation of

greenish tint. Orange increases in brilliancy.”⁶ Such advice also reflected the visual conventions operating in this period.

Published in the late nineteenth century, and especially addressed to the colour lithographer was W.D. Richmond’s 1885 treatise *Colour and Colour Printing as Applied to Lithography*. The long subtitle is indicative of its contents: *Containing an Introduction to the Study of Colour, an Account of the General and Special Qualities of Pigments Employed, their Manufacture into Printing Inks and the Principles Involved in their Application*. This was a companion volume to his *Grammar of Lithography*.⁷ Richmond described his subject as an “intricate and difficult subject,”⁸ and stressed that for colour printing, a successful outcome was dependent on close collaboration between artist and printer, especially because each new job presented as a fresh problem. Further, the necessity to also consider the pressman was crucial, for it was on the appearance alone of the finished result that the public would judge the work. Richmond warned that at the time there were no precise formulae in this field, and that no amount of mere reading and study of books would make a colour-printer, rather it was practice that was also needed, so that both study and experience would reinforce one another.

Detailed guidance was given to the colour lithographer in this volume, with separate chapters devoted to the discussion of single colours such as yellows, reds and blues. Other chapters covered topics that included colour theory, the mutual visual influence of colours, the preparation of printing inks, and how to determine the number and order of the printings. Knowledge of both a technical and practical nature was imparted. The young printer needed guidance especially because the facts of the visual behaviour of colour sometimes seemed quite capricious, and at the time, knowledge in this area was not easily gained other than from practical experience. For instance, on the subject of light and dark contrast, Richmond pointed out that “it is quite possible that in practice a pale yellow or blue may be lighter than something which we call white.”⁹ In the chapter on ‘Yellow’, Richmond’s facility with words to describe the appearance and behaviour of pigments in a style that mixes both fact and opinion with sound advice is seen, for instance, in his account of ‘Chrome Yellow’:

Chrome yellow, though not an unobjectionable pigment, is one of very great importance to the colour-printer. It is easily ground in varnish and works readily on the roller. It covers well, being one of our most opaque colours. Chemically it is a chromate of lead, and is obtainable in a variety of hues, varying from pale lemon to an orange approaching red. It should be soft to the touch, easily broken between the fingers and thumb with a crackling noise, and yet not gritty. Its variety of hue and its general good-working qualities make it a favourite with the printer. In some situations such as bright light and pure air, it appears to be a fairly permanent colour;

but under the opposite influences chrome yellows are not to be relied upon, as they frequently turn black. They form good tints with white, and brilliant greens with Prussian and Antwerp blues, though as an element of green with these iron blues they are not reliable...¹⁰

W.D. Richmond often advised reference to the use of colour in nature. On the subject of 'Red', Richmond wrote that "red is warm, powerful, beautiful, and cheerful in its effect on most observers...Nature seems to reserve it for its most gorgeous and lovely effects."¹¹ A general principle laid down concerning the order of printing was that opaque colours must precede transparent ones and that to "get the white paper shut out from view as soon as possible, ... and this involves the use of the lighter colours first."¹² However, the qualification was that to obtain soft gradations, light tones should be worked thinly and transparently over the darker tones, for example, "lake would follow vermilion; Prussian blue would fall over Oriental; yellow lake would cover chrome yellow, and so on."¹³ Another principle was that "the predominant hue of a subject calls for the colour of that hue to be printed late in the sequence: when a rich brown tone predominates the red and yellow can come after the blue."¹⁴ Such colour knowledge was built up from a visual experience of the printed effects obtained through much trial and error.

Colour Printing Standards in a Changing Technical Environment

The coming of photomechanical reproduction created new circumstances which required emphasis on adaptation, especially for the maintenance of acceptable colour printing standards in the new production environment. For successful trichromatic printing, the addition of a black impression was often necessary, but its successful application was dependent on the examination of the proofs after the three colours had been overprinted, so that the fourth black printing could be used to adjust the colour effects. This examination was a rigorous visual inspection and criticism of the results so far produced, and obviously also required the employment of acute colour vision.

New technology also meant that, for illustrators had to adapt to the reality of providing originals for entirely new printing processes, and printers needed to learn new skills to provide print products that satisfied a diversifying market in an age of new and increasing demand. Technical knowledge for the printer was becoming more important if good results were to be achieved. By the first decade of the twentieth century process colour printing could be achieved by various means of relief, planographic or gravure printing—photochromolithography and tri-chromatic block printing were but two of a plethora of possible processes open to the colour printer. For the artist, a grasp of the technical was becoming more important. One artist who was quick to appreciate the

implications of the changes that were rapidly occurring for the production of printed images, especially in the second half of the nineteenth century, was Aubrey Beardsley who worked with an eye to the photomechanical processes, but with results that were also outstanding in the artistic sense. Not only did he understand and adapt his style of drawing to the new reproductive processes of halftone and photogravure, but he also worked in close association with Carl Hentschel of the Swan Electric Engraving Company to produce such elaborate tonal effects as those achieved for the 1896 edition of *The Rape of the Lock*.¹⁵

Many artists did not adapt so well. Writing in the same year, Joseph Pennell, a lecturer at the Slade, gave insights into the state of the art of illustration, and the difficulties faced by artists providing originals to the printer at the end of the nineteenth century. Pennell's work, *The Illustration of Books: A Manual*, is salient to a discussion of the role and importance of standards, in this case as applied to the provision of the illustrative elements for books, including colour printed books, but also as applied to other classes of print products for which the attainment of consistent standards of colour printing for similar visual elements were required.

It was Pennell's view that, in the effort to lessen costs, the standard of technology by then possible for the printer's craft had improved to such an extent that it had become "capable of giving better and truer results in the hands of intelligent craftsmen than anything previously known."¹⁶ At the same time, he saw that "illustration had indeed reached technically, on the part of artist, engraver and printer, such a point of perfection, that it [had] at length forced critics and amateurs to give it the attention it [had] so long demanded."¹⁷ However, in his scathing criticism of the actual standard of much of the printed illustration of the time, Pennell laid much blame at the door of ignorance, not only on the side of the illustrator, but also on the part of the consumer. Pennell's lectures on the illustrative arts were designed to help dispel such ignorance and to impart an understanding of the importance of striving for excellent standards for print products to be presented to the marketplace, as well as the route to such achievement.

For high standards of illustration to result, Joseph Pennell advocated a respect for good design, but emphasised that good results also depended upon training acquired by means of a long apprenticeship, both in the studio and with a master printer.¹⁸ For the illustrator, he recommended the importance of colour work, saying:

First, in order to make the least important illustration, the student must have a sound training in drawing, and if he has worked in colour so much the better, for in the near future colour work will play a very important part, even in the least costly form of books and papers.¹⁹

Emphasis was also laid on using good quality ink, which he regarded as the most important of the materials used in pen and ink drawing. In aiming for high standards at the stage of the creation of originals, Pennell counselled that "what it does really is to give engraver and printer less trouble...in the majority of cases it is best to aid them, or otherwise your work is spoiled."²⁰ In Pennell's eyes photographic work was not proof against the lowering of standards, but rather, in that it translated all the mistakes as well, could be a cause—"Unless the engraver is an artist too he not infrequently bestows great pains on the reproduction of an accidental line, even though in order to do so he ruins the entire drawing."²¹ He laid emphasis on the working partnership between artist and engraver, advocating the desirability of the artist understanding the process from the point of view of the engraver, saying: "go down to his shop and find out how the work is done."²² Pennell also saw that for colour work, the changing technical environment had to be taken into account, and that, for instance, zinc plate would overtake the lithographic stone, not only for its lightness and portability and the fact that it could be easily mounted on the stone, but also because of the difficulties that were inherent in working on lithographic stone, such as that "in making light tones, the moment the brush charged with colour touches the stone, the stone itself turns much darker than the colour you are putting on it."²³ Advice in the department of colour work included the instruction to use no glaze or shine; and that for colour work to reproduce well, the illustrator must use either pure wash or body colour. It was his assessment that, at that time:

even with the best and most careful methods of reproduction, it will be almost invariably found that in the various stages of photographing, etching and printing, very much, if not all the charm has disappeared, even though the result be printed in colour, for up to the present no colour can be perfectly reproduced, or rendered into black and white, even by the best engraver in the world."²⁴

Detailed descriptions of many printing processes were given, with emphasis on how to achieve high standards in the finished product, in this case book illustration. Lectures covered the whole area of reproduction in the three main printing modes: processes of block making, including colour reproduction by wood engraving; etching and various methods of copperplate engraving; photogravure; and lithography, including photolithography. Pennell asserted that by then, just before the end of the nineteenth century, "all intelligent printers have now come to the conclusion that simple flat colours, put on side by side, will alone give good artistic results; they have only learned this, however, after going to the other

extreme: after trying to get pure colour and rich effects by using the three primary colours on top of each other, they obtained but crudeness, vulgarity, and mud.”²⁵

Standards and James Clerk Maxwell's Colour Theory

As discussed, a subtractive colour system is one in which colours are mixed or superimposed as inks, paints or dyes, as distinct from an additive system in which, from an initial state of blackness, the primary spectral red, green and blue lights are mixed in the right proportions until the full complement produces white light, as demonstrated by Clerk Maxwell. (See appendix 2B.) Primary colours in a subtractive system are defined as “those three colours other than black, white and grey no two of which can be mixed to produce the third but which together can produce all possible hues.”²⁶ This means that in effect, all applications of ink to a surface such as white paper subtract (absorb) some portion of white light reflected from it. Thus the three primary colour pigments for printing must be standardized and scientifically complementary to surely control the process, otherwise reflections or absorptions may give unexpected results. For instance, a true black may not result from the mixture of three colours that appear to be primaries, or, for other pigments, a muddy appearance may result more quickly than desired if even only two pigments have been mixed, if their combined power of absorption is greater than anticipated. This partly explains why colour printers historically debated the advisability of adding black to the primaries and why some printers achieved superior results. The use by separate printers of pigments with even slightly differing chemical or physical properties could account for quite markedly different results because, for example, even the fineness to which a pigment is ground can affect the way in which it attenuates light. If the pigment used to make an ink has been ground too finely, this may cause an increase in the scattering of light, in turn leading to desaturation of the colour.²⁷

In retrospect it can be seen that it has taken time to develop and gradually improve modern colour printing systems relying on a subtractive colour principle, but which at the same time fitted in with a photographic separation system relying on a primary colour concept suitable to the additive mixing of light of the visible spectrum. To gain reliable and repeatable results, given that the coloured light primaries are red, green and blue, suitable pigment primaries must be used as their corollaries in coloured printing inks where a subtractive ink system is used, even with white paper as the starting point, because the printing ink itself absorbs light. It was not until research in the 1960s demonstrated that although two additive primaries can produce the whole spectrum, for the broadest range of colour to be obtained,

three were best used: red, green and blue.²⁸ However, as pointed out by Anthony Mortimer in 1991, nearly a century after Joseph Pennell's lectures, it was still the case that "the subject of colour perception is an area of science which is still a long way from being completely understood."²⁹ One result in the print production environment is that even today colour work still requires much proofing and adjustment during the printing processes.

Advice and Example: the Trade Journals and the Improvement of Standards

An inspection of some of the British trade journal literature at the end of the nineteenth century gives a snapshot of the advice being given to assist printers at a time of sometimes confusing technical change, and the attempts being made to guide by example. Many British journals, as well as those from other countries came to New Zealand, as evidenced by R.C.Harding's constant reference to them in his own journal, *Typo*. For instance, at the time process engraving was first being tried in New Zealand, Harding advised printers that the *London Printing Times* was keeping well ahead with technical articles, citing "a beautiful illustration from a half-tone block" in the March 1890 issue. The *American Art Printer* was also mentioned as having "some beautiful "process" supplements,"³⁰ while the *American Lithographer and Printer* was advertised in the same issue of *Typo* as "devoted to Lithography and all the other Graphic Arts, such as Zincography, Photo-engraving, Photo-Lithography and all the new and modern Photo-Mechanical Processes."³¹ Harding referred to the beneficial influence of the trade journals on the English printers. After commenting that the March/April issue of the *British Printer* for 1891 was a "grand" number, he said that

it receives hearty support both from subscribers and advertisers. It would be a good thing for the Craft if colonial printers generally appreciated trade journalism as well as their English compatriots.³²

In the same year, Harding also reported that a recent review had concluded that some "British printers are doing artistic work equal to any produced in any part of the world," and added that their work was distinctive, in that it combined American "freshness and originality" with the "chaste coloring and correct taste" of the German printers.³³ On the other hand, examples of poor standards could be always be found to show that there was much room for improvement in comparison with the best. In the following year criticism of the standard of English art printing appeared in the *Journal für Buchdruckerkunst* in which it was said that even although English printers were using German type combinations, the results were a "parody" of the German. Although Harding considered such comment to be "rough on English job-printers," he added that *Typo* had been "pounding away" for years on

the subject of standards, conceding that “we regret to say that colonial printers are daily perpetrating atrocities such as those which are criticised in our Hamburg contemporary.”³⁴

To help keep colour printers abreast of the times, and to put before them examples of colour printing considered to be of a high standard, many of the trade journals included worked specimens as demonstrations of possible achievement. For example, in the years from 1895 to 1897, during a period of rapid change, examples published in *The Penrose Annual* demonstrated new techniques, at the same time showing that the use of colour was increasing. An example included in the 1896 issue was a reproduction of an oil painting ‘A New Year’s Congratulation’ printed by the Cranford Press, Chiswick, using three colour ‘process’. The blocks were by the Heliochrome Co. Ltd. of Notting Hill, and the Heliochrome inks were from A.B. Fleming & Co. Ltd. of Edinburgh and London. The artist was not cited.³⁵ Also for the benefit of the colour printer was a color chart that had been devised and engraved by E. Sanger Shepherd F.R.P.S., again printed by the Cranford Press using Fleming’s inks.³⁶ The following year in 1897 a colour chart designed by C.G. Zander (copyright) and printed with Fleming’s inks was provided to show the effect of the superimposition of three primary colours, yellow, red and blue, each in four gradations.³⁷ Another example from this issue was a reproduction of a painting by Roberti (copyright), ‘An Artist’s Studio’, produced by the three colour Chromotype process and printed by Waterlow & Sons of London.³⁸ Printed by the Country Press at Bradford, the example ‘The Stage’, reproduced from a coloured print by permission of the proprietors of *The Sketch*, demonstrated the results possible from negatives made using Carbutt’s colour screens.³⁹ Most *Penrose* examples were British, this annual being put before printers “as being thoroughly representative of British work of the present day, with a sprinkling of the work of our confrères abroad.”⁴⁰ One example from overseas that appeared in 1897 was the specimen ‘Rebecca Describing the Fight to Ivanhoe’ reproduced from a chromolithograph of fourteen colours. Here it was printed from process blocks in three colours by means of E. Nister of Nurneburg’s patent process, to whom printers were invited to apply for the right of use. As well as from other continental printers, for instance Husnik & Häusler of Prague, a few examples printed in the *The Penrose Annual* were from America, for instance, one that was included in the 1897 issue that was from M. Lamont Brown of Boston, and occasionally others were from Australia and New Zealand. (See plate 8.)

Articles on every facet of the colour printer’s art were published in successive issues of the journal, and similar topics of the times were covered in many other trade journals. Examples

from the first *Penrose Annual* had included 'Photographic Processes of Today', by the editor William Gamble, 'What Is It To Be—Colours Three, or Colours Five?' by Joseph [Pennell], 'Half-tone (screen) Blocks: Their Nature and Treatment in Printing' by C. H. Fisher (reprinted by permission from *The British Art Printer and Lithographer*), and 'The Outlook' by H. Snowden Ward, all in the first annual in 1895. Concerning process work, the last author said that although all firms executed much the same kind of work, the difference could be found in quality. He said that of the few houses by then specialising in colour work, some, such as the Swan Engraving Company, could charge higher prices because the work was of a higher standard, but to many printers in the general run of business, cost cutting was all too often the over-riding incentive. Mentioning that "editors are tired of the mediocre",⁴¹ he pointed out that there was a business advantage to be had in specialising in order to hone skills to produce quality work.

In his article Joseph Pennell explained that the three colour separation processes were losing "a large range of subtle changes of colour which, perhaps, [could] only be seen by the trained eye." Hence the need for drawing that allowed for this deficiency to some degree, a theme that was to be re-iterated in his *Manual* published a year later. Prophetically, he said that in the end the remedy would be found in the use of a photographic grey plus "a tone colour, ranging from buff to a flesh pink, according to the picture..."⁴² C.H. Fisher addressed many of the problems faced by half-tone printers (whether colour or not) wanting to control the coordination of all facets of printing in order to execute first-class work. He considered that quality control was essential for high class work, but that difficulties encountered were not the fault of the printer alone, but also of the ink-maker, paper-maker, and machine builder

for not studying better the requirements of this particular class of work, [thus to place] themselves in a position to supply, when called upon to do so, materials and plant suitable in every way to enable the printer to produce the best results.⁴³

The importance of equipment to the printer's achievement of high standards was not forgotten by Penrose and Company themselves. The detailed *Penrose & Co.'s Catalogue of all Requirements for Photo-mechanical Processes*, published with illustrations and prices (as part of the journal in 1895) was a ready source of such information for printers. Items in its pages of interest to the colour printer included photographic equipment, colour sensitive plates, Carbutt's colour screens, whirlers, proof presses, printing inks, lithographic stones, a list of books on photomechanical processes and printing machines, such as cylinder, collotype, lithographic and iron platen presses. (See also section III.) For example, it had

been mentioned in an article in the 1895 issue that great progress had been made over the past year in colour process work, such as that made possible by the introduction of Carbutt's Photochromic Colour Screen. It was explained that if the three separation negatives that could be produced through the use of such a screen were "equally exposed," and were printed "in accurate register," it was possible to get "a very good approximation of the colours of nature, provided the blocks [were] carefully printed in inks which reflect no other colour but their own."⁴⁴ It was difficult at the time to procure standard coloured inks, but printers were advised also that "recently a firm of ink makers have announced that they have succeeded in making a set of standard red, yellow and blue inks which are guaranteed to reflect only their own colour."⁴⁵

In 1896 C.G. Zander, manager of the colour department at A.B. Fleming Inks, explained that the new processes had called for new inks, and that their manufacture, a scientific process, had involved much research. He said that in order to achieve permanency (which was one of the most important qualities of a printing ink), by then aniline dyes were replacing many of the older pigments used in former years to manufacture inks. The second essential was transparency, necessary in a quality printing ink, he stressed, because without it, mixtures, for instance those required for lithographic overprinting, would not take place; rather the last printed colour would be dominant. Zander stated that at that time, "the three pigments which alone produce a correct coloring of a picture produced by a photochromic process, are a pure red pigment...a pure yellow, as artists call it, "lemon yellow"; the third a cyan blue...This will be a shade of cobalt blue."⁴⁶ In further discussion of the state of the art of making coloured inks, he said that at the time, yellow was the hardest colour to perfect: "I have not come across one that will answer all the requirements necessary ie, permanency, transparency, and the requisite shade." He advised that it was best to print the yellow first—as long as it was permanent and of the correct shade—as in that place it could be more opaque. Blue, being the least luminous, should be printed last, he said, adding that the ink-maker had to take especial care where three-colour printing which was especially sensitive to slight shade variations was envisioned, and that in this case more grinding was needed to prevent such variation.⁴⁷

For the achievement of high quality colour process printing in which the colors would appear cleaner and brighter, as well as for ease of printing, fine-grained blocks were recommended, and because smoother paper causes more reflection, also causing colours to appear brighter, use of only good quality paper that was hard, well-sized and glazed was

advocated. For good results, printers were also advised to use hard packing for the presswork, for instance, eight or ten sheets of cream wove paper. As to presses for half-tone engraving, printers were apprised that owing to the evenness of inking "the most perfect results are produced by machine printing." Best results would be attained using a press "with a direct downward platen pressure such as the Albion, or a scraper pressure as in a lithographic press, or a cylinder pressure, the latter being on the whole preferable." Power presses should be used for long runs.⁴⁸ That control of inking was most important in the achievement of uniformity at the plate stage was also stressed, since "an error of even one per cent in the shade of the inks may throw out the whole scheme of colour."⁴⁹ However, in another article, also published in this issue, A. Dawson pointed out that tools and equipment could only be expected to be servants:

they only produce pleasant pictures when guided by brains and more than brains, that strange thing which we try to indicate by the words, talent, taste, art,this indescribable essence of human kind makes all things its tools—the lens, the laws of light and heat, and of chemistry...⁵⁰

In discussing the factors critical to the success of three colour printing, C.G. Zander pointed out that such printing was not merely mechanical, but that the printer's knowledge was one of the most important factors. For block making a thorough knowledge of spectroscopy and photography was needed, and for the printing, knowledge of the processes and principles behind them was necessary. He considered that at the time a lack of knowledge was "a serious stumbling block in the way of the success of photochromic printing."⁵¹ Trade journals such as this kept the printer up-to-date, the *Penrose Annual* continuing to do so until well after the period under study. They were a medium in which discussion of improvement to both process and practice relevant to the production environment could be conducted, and together with the presentation of worked examples, promoted to printers the business benefit to be had from the attainment of high standards.

Early 20th Century British Colour Printing Standards

Colour Printing Standards and Cost-effective Means

The expense of many of the high class printing processes always had lain in the large degree of manual work required, as well as in the acquisition of specific skills, for instance those required to competently handle an idiosyncratic colouring procedure or a sensitive medium such as collotype. The acquisition of such skill had in practice often involved trial and error, and had in turn meant that ventures of this nature were frequently unprofitable in England. However, it was also true that some firms, such as Bemrose and Sons in Derby and Griggs and Sons of London, were able to accomplish fine colour collotype work in the early part of the century, although more of this class of colour printing emanated from France. In 1909,

at the Dresden Photographic Exhibition, many excellent examples of this kind of colour printing had been shown; images produced with collotype providing a monochromatic impression and colour added by means of halftones or lithography. In 1908, reproductions of famous paintings published by the Medici Society had begun to appear in England, also printed by means of colour collotype. Over the course of the twentieth century, it was to be the application of photography to each of the printing processes that was destined to provide cost effective printing methods enabling the provision of print products of acceptable standard to be provided to the various segments of the marketplace. Expensive collotype was superseded by very fine lithography, while halftone letterpress came to have its main application in the printing of most books and small-scale jobbing work, as well as for newspaper printing. Michael Twyman has summed this up:

The twentieth century has...seen the widespread commercial development of photography in all three major branches of printing. Each has its own particular value: photolithography has developed as a most useful all-purpose process, giving great definition on a wide variety of papers; photogravure is mainly used for magazine work, packaging, and quality reproduction of paintings; half-tone letterpress is still widely used for newspapers, and for most books and small-scale jobbing printing.⁵²

For colour work, further development of three and four colour processes eventually provided the potential for improved results in the production environment, so that for example, the means for colour illustration of a higher standard was possible, and for better, although not perfect, reproduction of artists' originals. Photogravure used in combination with three and four colour printing processes began to demonstrate that photomechanical did not always need to mean cheap and nasty. By the First World War standards were improving for mass colour printing, for example, for the production of half-tones in magazines, as "more expertly made plates, careful presswork, and highly finished paper...made magazine reproduction respectable and sometimes good."⁵³ However, research into improving photogravure that had been in progress in Geneva before the First World War, stopped during the war and was not recommenced until 1923.⁵⁴ After this, with the employment of reel-fed rotogravure machines which could print three thousand impressions per hour on both sides of the paper, reel-fed rotary photogravure began to come into its own for pictorial work where an extremely large output was called for, including the printing of packaging and postage stamps. However, it was not until this era, after the period under study, that even in Britain, publications such as the *Illustrated London News* had begun to be produced by photogravure.

Although some work of a good standard was being produced in the field of quality design and illustration for books in the period just before the first World War, including that of Rex

Whistler who was known for his imaginative work in the Baroque style, by this time the other extreme had been all too prevalent. By 1914 the generally low standard of book illustration in England was partly attributed by Anthony Gross to the fact that "the great school of Victorian and Edwardian illustrators [had] petered out owing to a decrease in observation and study of the subject, the later illustrators replacing this mainly by clichés."⁵⁵ Looking back in 1921, just before the founding of the Nonesuch private press, H.G. Aldis, writing in *The Printed Book*, had complained bitterly about the generally poor standards, particularly of colour letterpress in the early part of the century, partly blaming early trichromatic processes of colour printing for this state of affairs.

From the point of view of the printed book the introduction of process methods of illustration cannot be regarded as altogether fortunate. Too little consideration is given to the manner in which the illustrations are associated with the printed page; and it rarely happens that a book gains anything as an example of typographic art from the process pictures with which it is illustrated. The arrival of the three-colour process has worsened matters; and the present riotous use of cheap colour illustrations is nothing short of a calamity. Any excuse serves for the addition of these coloured crudities, which, printed on shiny 'art' paper or dabbed on pieces of brown paper, are intruded between the leaves of the book almost at random. Little wonder that the outraged volume, taking advantage of its flimsy structure, endeavours to shed them at the earliest possible moment.⁵⁶

Generally, the aims of English colour printers in the early part of the century had been based on publishers' wish to fulfil the market demand for the inexpensive, and a myriad of processes came and went as the search for ever faster and cheaper colour printing proceeded. By the early part of the century all three major printing processes had been commercially exploited to provide colour printing processes suited to the wide variety of printing required for daily life and to a range of standards and costs. Various combination processes, often using halftone blocks to produce the basic illustration, were in use, many of them experimental and often ephemeral. In England and America the French practice of using grained blocks to colour half-tone pictures had become more prevalent by 1910; this process had been patented as 'Multitone' by the Boston firm Tolsom & Sunergren in 1903. In this process the half-tone block was overprinted last, although in another version of the same process, the procedure was reversed, with the coarse-grained picture block printed first and then the colour added from halftone blocks after it had dried. "The tone plates [were] of zinc, transfers from the original being made, and only the portions required for each colour retained, the rest being routed out."⁵⁷

In Britain, as the three-colour halftone process had become the standard colour printing method, experimentation had been largely stifled, so that it was to France that printers had to look for originality in early twentieth century colour printing. On the continent and also

in America the four colour process was explored, as printers followed the practice of its advocate, Dr. Albert. In 1905, Zander took out a patent in England for his four-colour Complementary Colour process based on the use of red, yellow, green and blue. Use of this method produced superior results for bright colours, as well as achieving better blacks. Other printers were trying simplification once again, in order to do away with the expense of a fourth impression. This approach led to the development of two-colour printing and even the reversion once again at times to hand colour work.⁵⁸

Twentieth Century: Ongoing Involvement of the Artist

In the twentieth century, even long after the period under study, despite the general separation of the artistic and the industrial processes of colour printing, the artist was still seen as having a part to play in reproductive colour lithography. In his book *The Technique of Colour Printing by Lithography: a Concise Manual of Drawn Lithography* published in London in 1948, Thomas E Griffiths' summarised in thirteen steps the procedure that had been employed since the late nineteenth century for producing a lithograph using the three-colour process. After the preliminary examination of an original, the two steps that involved personal colour judgment were the second and the twelfth: the former involved deciding the number and sequence of the colours, and the latter, the proving of the colours. For both tasks the artist's colour perception ability was seen as a vital necessity. Griffiths suggested that the artist should guide the pressman in the selection of inks to be used—to ensure correct colour, opacity and strength, as well as in the order for the superimposition of the colours. He saw an advantage in the use of the offset press in terms of the artist's involvement in the process, because it required no heavy work as did the mangle type of hand press: "The cylinder only requires a slight push to make it roll over the stone or plate, and is really suitable for artists. They should not have to do manual labour when pulling a proof as they may want to go on drawing shortly afterwards."⁵⁹ Griffiths explained that "as no lithographic printing inks are absolutely opaque or absolutely transparent they have to be referred to as semi-opaque, semi-transparent."⁶⁰ Examples were given (using the standard set by then available):

Primrose Chrome	Semi-opaque
Pale Chrome	
Golden Chrome	
Scarlet	Semi-transparent
Crimson	
Cerise	
Bronze Blue	Semi-transparent
Turquoise Blue	
Royal Blue	
Fire Orange	Semi-transparent

Blue Emerald Green	Semi-opaque
Violet	Semi-transparent
Black	Semi-opaque
Kremnitz White	Semi-opaque

Thomas Griffit's *Colour Printing: a Practical Demonstration of Colour Printing by Letterpress*,⁶¹ which contains several demonstration charts of colour printing is visually informative in showing how varying the process, the tones of the inks and the order of printing the colours can alter the result, given that the same original subject had been used throughout. Some charts compared results gained from the use of standard letterpress inks, and some from the use of lithographic inks. By comparing the different visual results it can be seen exactly how each of these factors plays a part in determining the final appearance of a colour reproduction. For example, two charts in which everything was identical apart from the order of printing the colours could be compared. Chart A, in which a printing order of yellow, red, blue, then black had been used, could be compared with Chart B, printed in the order red, yellow, black, then blue, to discover the nature of any differences in the finished result. In this comparison it could be seen that Chart A was clearer in colour, with more light in it, whereas Chart B had less colour contrast and a muddier colour appearance. Other charts gave a comparison of the results obtained as above with those obtained when each of the inks used had been toned with its complementary. These charts demonstrated how this procedure had sharpened the colours to produce a richer print. However, Griffiths was the first to admit that these demonstrations were not the last word and alluded to the relativity of final judgements concerning the subtlety of colour, when he pointed out that after all it is the client who is always right. He commented that "if the proofs are passed by the client then it is nobody's business to say that the job could be much better printed by altering the order of printing the colours or by modifying the hues of the colours."⁶²

In a changing environment, where a variety of processes were being tried, false paths were often trodden, or skill levels were not always equal to the task. Colour preference is ultimately due to taste, but printed colour quality also depended on publishers' priority for cost reduction. The savings afforded by the low cost colour etching processes that had largely overtaken the engraver's art often produced results that were not wholly predictable. Writing in 1910 Burch observed that in circumstances demanding low cost to be the chief consideration rather than good taste, as far as colour printing was concerned, the finished result at that time could be "oftentimes rather startling, not to say unnatural, but the cheap

novel or magazine publisher generally wants something gaudy, and cannot waste time in selecting harmonious colour schemes.”⁶³

What was needed were the honing of systems to provide the means for better standards at an affordable cost, and over the twentieth century much scientific research contributed to the cause. It was noted that “it is the rule that every improvement of methods to reproduce colored pictures has led to increased business.”⁶⁴ Knowledge systems and tools were gradually developed to take over tasks that had previously been performed by human colour judgement, for instance, the development of the science of densitometry from late nineteenth century experiments undertaken by Hurter and Drifffield made a valuable contribution to the maintenance of standards for modern colour printing. Densitometry can be used to accurately measure the relative mass of atomic silver produced during the development of separation films. It was found to be difficult to measure the mass of silver in a direct way, but in 1890 Hurter and Drifffield reported that the mass of silver formed in fact does not bear a direct relationship to the transmission, but rather is “proportional to the logarithm of the opacity,”⁶⁵ or density. Through this discovery an indirect approach was developed that involves calculation from the measurement of the attenuation of light as it interacts with the film. In this approach, the proportion of light that has been transmitted through the exposed parts of a negative is compared with the light that was transmitted through the clear or unexposed portions. Since this break-through, a crucial factor for the achievement of correct tonal balances, densitometers were developed for use in most stages of the colour printing processes. Anthony Mortimer has outlined discoveries that have contributed to the ongoing development of the standards that over the twentieth century have led to more cost effective and reliable colour printing in *Colour Reproduction in the Printing Industry* published in 1991 by PIRA.

¹ D.F. McKenzie, ‘Robert Coupland Harding on Design in Typography’, in *An Index of Civilisation: Studies of Printing and Publishing History in Honour of Keith Maslen*, ed. R. Harvey, W. Kirsop & B.J. McMullin (Clayton, Vic.: Centre for Bibliographical and Textual Studies, Monash University, 1993), 203.

² John Southward, *Practical Printing: A Handbook to the Art of Typography*, reprint of 1882 ed. (New York: Garland Pub. 1980), 504-505.

³ John Southward, *Practical Printing*, 507.

⁴ Ibid.

⁵ Ibid., 508.

⁶ Ibid., 509.

⁷ W.D. Richmond, *The Grammar of Lithography: A Practical Guide for the Artist and Printer in Commercial & Artistic Lithography, & Chromolithography, Zincography, Photo-lithography, and Lithographic Machine Printing*, ed. and rev., with an introd. by the editor of *The Printing Times and Lithographer* (London: Wyman, 1878.)

- ⁸ W.D. Richmond, *Colour and Colour Printing as Applied to Lithography: Containing an Introduction to the Study of Colour, An Account of the General and Special Qualities of Pigments Employed, their Manufacture into Printing Inks, and the Principles Involved in their Application* (London: Wyman, 1885), preface.
- ⁹ *Ibid.*, 11.
- ¹⁰ *Ibid.*, 25.
- ¹¹ *Ibid.*, 31.
- ¹² *Ibid.*, 101.
- ¹³ *Ibid.*
- ¹⁴ Thomas E. Griffiths, *Colour Printing: A Practical Demonstration of Colour Printing by Letterpress, Photo-offset, Lithography and Drawn Lithography, With Illustrations Demonstrating Alternative Methods of Production and Including a Comprehensive Colour Chart* (London: Faber, [1948]), 19.
- ¹⁵ Geoffrey Wakeman, *Victorian Book Illustration: The Technical Revolution* (Newton Abbot: David & Charles, [1973]), 149.
- ¹⁶ Joseph Pennell, *The Illustration of Books: A Manual for the Use of Students: Notes for a Course of Lectures at the Slade School, University College* (London: Fisher Unwin, 1896), 9.
- ¹⁷ *Ibid.*, 8-9.
- ¹⁸ *Ibid.*, 154.
- ¹⁹ *Ibid.*, 14.
- ²⁰ *Ibid.*, 47.
- ²¹ *Ibid.*, 51.
- ²² *Ibid.*, 91.
- ²³ *Ibid.*, 117.
- ²⁴ *Ibid.*, 81.
- ²⁵ *Ibid.*, 109-110.
- ²⁶ Harold Osborne, ed., *The Oxford Companion to Art*, 16th ed. (New York: Oxford University Press, 1995), 260.
- ²⁷ Kurt Nassau, *The Physics and Chemistry of Color: The Fifteen Causes of Color* (New York: Wiley, c1983), 290.
- ²⁸ Augustine Hope and Margaret Walch, introd. by Michel Pastoureau, *The Color Compendium* (New York: Van Nostrand Reinhold, c1990), 4.
- ²⁹ Anthony Mortimer, *Colour Reproduction in the Printing Industry* (Surrey: Pira International, 1991), 22.
- ³⁰ *Typo*, 4 (May 1890): 57.
- ³¹ *Ibid.*: 58.
- ³² *Typo*, 5 (July 1891): 111.
- ³³ *Ibid.*: 103.
- ³⁴ *Typo*, 6 (July 1892): 55.
- ³⁵ *The Process Year Book for 1896*, 2 (1896): opp. 32.
- ³⁶ *Ibid.*: opp. 120.
- ³⁷ *The Process Year Book for 1897*, 3 (1897): opp. 60.
- ³⁸ *Ibid.*: opp. 32.
- ³⁹ *Ibid.*: opp. 97.
- ⁴⁰ *The Process Year Book for 1896*, 2 (1896): 1.
- ⁴¹ *Process Work Year Book: Penrose's Annual for 1895*, 1 (1895): 13.
- ⁴² *Ibid.*: 40.
- ⁴³ *Ibid.*: 41.
- ⁴⁴ *Ibid.*: 12.
- ⁴⁵ *Ibid.*
- ⁴⁶ *The Process Year Book for 1896*, 2 (1896): 66.
- ⁴⁷ *Ibid.*: 67.
- ⁴⁸ *Process Work Year Book: Penrose's Annual for 1895*, 1 (1895): 9.
- ⁴⁹ 'Printing by Three-colour Process', in *Process Work Year Book: Penrose's Annual for 1895*, 1 (1895): 11.
- ⁵⁰ A. Dawson, 'Swelled Gelatine', in *Process Work Year Book: Penrose's Annual for 1895*, 1 (1895): 26.
- ⁵¹ C.G. Zander, 'Halftone and Photochromic Printing Inks', in *The Process Year Book for 1896*, 2 (1896): 65.
- ⁵² Michael Twyman, *Printing 1770-1970: An Illustrated History of its Development and Uses in England*, reprint, with a new foreword by Ruari McLean and an additional bibliography (London: British Library, 1998), 33.
- ⁵³ John Szarkowski, *Photography Until Now* (New York: Museum of Modern Art, 1989), 189.

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- ⁵⁴ Colin Clair, *A History of European Printing* (London: Academic Press, 1976), 383.
- ⁵⁵ Anthony Gross in David Bland, *A History of Book Illustration: The Illuminated Manuscript and the Printed Book*, [2nd rev. ed.] (Berkeley: University of California Press, 1969), 367.
- ⁵⁶ H.G. Aldis, *The Printed Book*, 2nd ed. rev. and brought up to date by J. Carter & B. Crutchley (Cambridge: Cambridge University Press, 1947), 113.
- ⁵⁷ R.M. Burch, *Colour Printing and Colour Printers* (London: I. Pitman, 1910), 217.
- ⁵⁸ *Ibid.*, 261-263.
- ⁵⁹ Thomas E. Griffiths, *The Technique of Colour Printing by Lithography*, with an introduction by Frank Pick (London: Faber, [1948]), 17.
- ⁶⁰ *Ibid.*, 23.
- ⁶¹ Thomas E. Griffiths, *Colour Printing: A Practical Demonstration of Colour Printing by Letterpress, Photo-offset, Lithography and Drawn Lithography, With Illustrations Demonstrating Alternative Methods of Production and Including a Comprehensive Colour Chart* (London: Faber, [1948]).
- ⁶² Griffiths, *The Technique of Colour Printing by Lithography*, preface, x.
- ⁶³ Burch, *Colour Printing and Colour Printers*, 241.
- ⁶⁴ H.E.J. Neugebauer, 'Monitoring as Means of Improving Color Correction', in *Printing Inks and Color: Proceedings of the Fifth International Conference of Printing Research Institutes Held at the National Printing Ink Research Institute Lehigh University, Bethlehem, Pa., U.S.A. 1959*, W.H. Banks, ed., (Oxford: Pergamon Press, 1961), 156.
- ⁶⁵ Mortimer, *Colour Reproduction in the Printing Industry*, 45.

COLOUR VISION: A RECIPROCAL FACTOR

Seeing Colour

A visible image is perceived to be in the outside world, that is, the human eye is a sense organ that projects sensation outwards. By contrast, the sense of pain is felt to be within the body. If one is burnt by a heat source that is at a distance, one feels that the sensation is in the leg, rather than being outside the body. However, it has been observed that in reality "the rich colours that we see are inventions of the nervous system rather than properties of light itself. Colour, like beauty, is in the eye of the beholder."¹ How then does this come about?

An Outline of the Physiology of Colour Vision

Perception of colours is possible through the coordination of the data-collecting sensory receptors in the eye with the interpretive vision areas of the brain, by means of the connecting nerve pathways and the intermediary lateral geniculate body. The process of colour vision thus begins with specialised receptors that gather data from the environment by responding to light, that is, to the portion of electro-magnetic waves reaching the earth from the sun known as the visible spectrum. Anthony Mortimer has defined the human power of colour vision, saying that: "The sensation of colour is achieved when electro-magnetic waves between the limits of approximately 380 and 760 nanometres are incident upon the eye."² The range of colours that we have the ability to see thus grades from short wave to long wave, and are well-known as the colours of the rainbow; ranging from violet (short wave) through indigo, blue, green, yellow, orange and red (longwave). Hence, for example, the visual sensation that we commonly call red is caused by long waves falling on the retina. Most light waves reaching the retina are reflected to the eye from objects in the visible world, but the reflected light does not contain all the wavelengths of the visible spectrum because the object upon which the light has fallen has modified or attenuated it. Attenuation may be caused by absorption, refraction or diffraction of some wavelengths before they reach the eye, the attenuation being different according to the particular wavelength. The result is that "the relative attenuations of the various wavelengths determine its colour, and the total attenuation determines the lightness of the colour."³ As well, the appearance of the colour is determined by the manner in which light is reflected or transmitted to the eye by such properties of the object as gloss, texture and translucency.

The sensory receptors necessary for vision are the light sensitive cells, the rods and cones, which reside in the retina at the back of the eye-ball. These are the cells that are affected by lightwaves that are incident upon the eye, and, together with the nerves and visual areas of the central nervous system, are therefore responsible for our ability to see. In the centre of the retina at the back of the eye is the 1.5mm wide fovea, containing 34,000 cones and no rods.⁴ The cones are sensitive to colour, while the rods are not, and hence the fovea is the area of the retina upon which colour vision is dependent. However the peripheral vision is important for other functions, such as the maintenance of normal posture; this fact can be demonstrated by walking through a tube when it will be found that swaying and bumping is experienced. If light levels are high enough for the cones to operate, the rods are inhibited, and conversely, at low light levels the cones become inactive, resulting in an absence of colour vision in those conditions.

The fovea appears as a pit because the layer of nerve fibres is thinned out: the nerve fibre layer skirts around it. The result is that the light does not diffuse as much as it otherwise would. The human eye is developed to a high degree of sensitivity because it contains more rods and cones than do the eyes of other vertebrate species. Hecht has shown that an individual rod is able to respond to a single quantum of light energy: the physically smallest possible unit of light energy. The response of rods and cones to light is due to the presence of visual pigments embedded in proteins within these receptor cells. The activation of a single molecule of visual pigment can be recognised by the Central Nervous System (CNS), the 'messages' being carried along the nerve pathways connecting the sensory organs with the brain via two lines, private lines or diffuse lines.

Visual acuity or the ability to perceive fine detail is a process of discrimination between light and shadow falling on the rods and cones. The rods respond to low light conditions to a greater degree than the cones. It can be shown experimentally that the fovea, the exclusively cone area, has greater visual acuity in bright light than the peripheral areas of the retina due to the fact that the cone cells of the foveal area are more closely packed: the foveal mosaic is better. Thus it is the fineness of the grain of the fovea that allows maximum visual acuity. There are a series of optic and labyrinthine reflexes operating to keep the image focussed on the fine-grained fovea. In low white light conditions, visual acuity is relatively greater for the peripheral vision due to the exclusive presence of rods. In dim light one can experience this phenomenon by deliberately not focussing the eye on any particular object in the field of vision, and it will be found that more is then visible in the peripheral field of vision. In low light conditions, due to the different participation of rods

and cones, the rods are recording relatively more visual information and the cones relatively less, the result being that the perception of colours changes: we feel that the colours themselves have changed. Thus colour perception is very dependent upon the light conditions in which coloured objects are viewed. The classic experiment, known as the Pukinje shift experiment, demonstrates that the apparent luminosity of different colours varies according to whether the light by which they are viewed is bright or dim. In low light, or scotopic conditions, the brightest colours appear to be in the green part of the spectrum, whereas in brighter light or photopic conditions, the brightest colours shift to the red end of the spectrum. Because the cones are colour sensitive, it can easily be demonstrated that an increase in visual acuity can be secured in low light conditions, for example for reading, by using red light. When viewed in low white light conditions, a coloured object and a black object both appear black, but as light increases, the colour gradually becomes visible as the threshold for cone activity to begin is reached. The colour sensitive cone cells are not identical; for instance, it can be shown that they do not all have the same light threshold. However, in bright light, we have maximum visual acuity because all the cones are functioning, hence we can see more detail as well as full colour. In dim light, visual detail is lost due to the fact that some cones are not firing: this situation equates to the foveal grain becoming coarser.⁵ Experimental work in the field of colour vision has incrementally explained the physiological mechanisms that cause all these visual phenomena. Recent research has added new dimensions to this understanding.

The Incidence of Normal Colour Vision

It has long been suspected that human colour vision results from a system that works on a trichromatic basis, and this is now known to be a fact. Over the last few decades experimentation has increasingly revealed the physical and chemical structures and functions responsible for our trichromatic colour vision. In the nineteenth century the earliest theories of colour vision, such as those of Thomas Young⁶ and Hermann von Helmholtz⁷ postulated that the first visual processing stage requires the presence of three separate photopigments in the eye, and that these were the red, blue and green photopigments, that absorbed correspondingly in three different places in the spectrum. It is now known that these pigments exist in the cones and that the absence of any of them, or a deficiency in their functioning is the cause of impaired colour perception or colour deficiency as this condition is usually called. Colour deficiency is usually an inherited rather than an acquired condition, the latter being relatively uncommon. The severe form of colour deficiency results from the absence of any one of the photopigments, the milder form being caused by defective photochemistry. In humans the condition of only having black and

white vision is extremely rare but conditions of colour deficiency resulting in disturbances of the colour sense are much more common. The extent of colour vision deficiency ranges from extreme, when typically only three colours of the rainbow plus grey are discerned by the sufferer, to mild, when only minor alterations in colour vision are experienced. The latter can be described as a dilution or desaturation of colour perception that is comparable to the effect of reducing the colour content on a TV.

In the course of experimentation to explain both normal colour vision and colour deficient vision, much has been learnt about the controlling neural mechanisms, as well as something of the part played by inheritance in the colour vision of an individual. It has been discovered that colour perception is a sex-linked characteristic, with the condition of deficiency being present to a greater or lesser extent in approximately 8% of the male population, compared with only 0.4% of the female population. Whereas 2.5% of affected male individuals are in the severely colour deficient category, the greater percentage, 5.5%, can be said to be only mildly affected. In normal colour vision, the rainbow is experienced as consisting of colours ranging from red through orange, yellow, green, blue indigo and violet, in that order. However, typical colour deficiency results in colour perception in which "some colours are confused, while others appear to be grey or almost devoid of colour."⁸ Colours discriminated tend to be yellow-orange, grey blue and violet; blue-green is often confused with grey, while blue tends to be the only colour discriminated relatively reliably. Thus for some individuals, the ability for colour perception is genetically diminished, and hence the experience and appreciation of colour is necessarily incomplete. These statistics provide a basis for understanding why the human appreciation of colour is not uniform but rather is considerably variable. Although great strides have been made in the understanding of colour vision phenomena, much still remains to be completely understood, particularly for some aspects of colour vision such as adaptation and contrast effects. Anthony Mortimer has said that problems in understanding these areas are significant for colour printing, because they "remain as the most significant stumbling block to a complete automation of colour matching procedures or qualitative assessment of colour reproduction."⁹

Towards an Understanding of Normal Colour Vision: 19th Century Theory in the Light of 20th Century Research

It can be shown that most of the colours a normally sighted person is capable of perceiving can be matched by a mixture of the three wavelengths of light that are usually characterised as the widely separated, monochromatic (single colour) radiations of red, green and blue, the three primary colours of Maxwell. Ian Gordon has defined these primaries:

These primary wavelengths need not be precisely specified, provided that (a) they span the visible spectrum - there is a wide range of choices among the blues, greens and reds - and (b) no two primaries should be exactly complementary. For each hue in the visible spectrum there is a complementary hue which, when added to the first, yields an achromatic mixture. Such complementary pairs must be avoided when choosing the primaries.¹⁰

In the nineteenth century, it had been Thomas Young who elucidated the wave nature of light, and who also proposed that the eye contains three colour resonators which are vibrated by light, and which relay a colour message to the brain. In 1801, Young proposed that "each sensitive filament of the nerve may consist of three portions, one for each principal colour."¹¹ Research has since confirmed that the three photopigments of the eye that equate to Young's resonators consist of three kinds of light-absorbing pigment molecule contained within the photoreceptor cells of the eye. Helmholtz later developed the theory to postulate that the retina contained three different kinds of colour sensitive cones, one of which responded to longwave or red light, one to green or middlewave light and one type to shortwave or blue light. Further, the hypothesis was that these receptors were connected to the brain cortex via neural networks to enable colour vision. Denis Baylor has recently recounted that Maxwell's work with coloured lights, which proved that a "minimum of three primary lights is needed to generate all colour appearances",¹² also suggested that there must be three colour receptors in the eye.

Other researchers began by viewing colour vision from a slightly different angle. The psychological primaries have been determined as being the four unitary hues of yellow, red, green and blue, because in their unitary states they are each generally held to appear to contain no other colour; each is independent of the others. Thus, for instance, yellow is felt to have "no apparent redness or greenness about it."¹³ In 1878, Hering sought to explain the psychological primaries and began to develop an opponent response theory, whereby he proposed a visual mechanism in which there are three pairs of response processes, consisting of a white/black response, a yellow/blue and a red/green response.¹⁴ Since then, explanations of these and other aspects of colour vision have endeavoured to take into account all the known visual phenomena, and each contribution to any one aspect has gradually enabled the greater understanding of this complex field. Research results from the last few decades have shown that aspects of both the Hering approach and the Young, Helmholtz and also Maxwell approaches are correct, both the opponent and the trichromatic theories having contributed to fruitful paths of investigation.

Recent Research – Colour Receptors in the Eye

In 1964, Rushton made a breakthrough in vision research when he perfected the technique of microspectro-photometry to make possible the search for retinal visual pigments by

assessing how retinal cells absorb light. Gordon defines the technique, stating that “in essence, microspectro-photometry entails shining a beam of pure, monochromatic light onto the cells of the retina, trapping the returning beam and measuring the difference between the two.”¹⁵ Further understanding of how the visual pigments contribute to our visual powers was gained by closer examination of their chemical structure, and how they function. Research into both these aspects has shown that rods and cones are similar in structure, and that light is absorbed in both by the visual pigments, all of which have a similar but not identical molecular structure. The visual pigment of the rods, rhodopsin, has the ability to respond to the absorption of only a single photon, whereas the ability of the less sensitive cones is uniquely to send messages concerning colour information. Denis Baylor has described the similarity between the visual pigment molecules, whether rod or cone pigments:

All such molecules share a structural motif in which a single chain of amino acids is embedded in a lipid membrane. The amino acid chain is folded into a roughly cylindrical structure and traverses the membrane seven times. Light is absorbed by an accessory group buried in the centre of the pigment. This group, the chromophore, consists of 11-*cis* retinal, an isomer of vitamin A aldehyde in which the side chain is bent at the 11-12 carbon bond in the side chain. At its aldehyde end the chromophore is covalently linked to the seventh transmembrane segment in the amino acid chain.¹⁶

In a contribution to the recent book *Colour: Art & Science* Denis Baylor has given an historical perspective of work carried out by researchers in the field of human colour vision, a field in which he has personally made a large contribution. It can be seen that the cumulative effect has been that gradually the mechanism of colour vision has been revealed. In the chapter ‘Colour Mechanisms of the Eye’¹⁷ Baylor explains how light information is encoded by the receptor cells in the eye, stating that it is now known that when a photon arrives in the retina, it is the isomer called retinal making up the chromophore buried in the centre of the visual pigment molecule that absorbs it, and this absorption in turn causes the straightening of the side chain, and that this event, “*cis-trans* isomerisation, is the only direct effect that light has on vision.”¹⁸ The chromophore structure straightening event pushes on the protein (the amino acid chain) thus causing it to change shape, and at the same time activates another protein, transducin, to behave as a catalyst by becoming “a template on which a large number of transducins are serially activated.”¹⁹ This means that an almost instant amplification effect results because this catalytic activity produces a large number of transducin molecules from only one active pigment molecule within a fraction of a second. These active transducins in turn cause the enzyme phosphodiesterase to break down a substance, cyclic GMP, inside the outer segment of the chromophore, causing it to bind to “specialized sites in the surface membrane.”²⁰ This causes a hole to open that allows positive ions, mainly sodium ions, to diffuse into the cell under the influence of the

difference in voltage on the two sides of the membrane. When the action of cyclic GMP is exhausted, the hole closes, and the voltage in the cell again becomes more negative. This pattern, of receptor molecules causing triggering, followed by an enzyme cascade in turn causing amplification, has been found to be a commonly occurring human physiological mechanism. In this case, it is the underlying cause of the electrical impulse which travels along the axon of the neurone to the synapse. At this location, a chemical signal occurs that "lowers the rate at which a synaptic transmitter substance, the amino acid glutamate, is secreted onto the bipolar and horizontal cells."²¹

Thus the neural message can be thought of as an indication that light has fallen on and been absorbed by the receptor cell, this information having been coded according to the voltage swing size along the cell and the size of the fall in glutamate concentration at the synapse. In 1979, Yau, Lamb and Baylor were able to also verify that a unit photon response was not capable of a specificity that would determine whether the original stimulus was the wavelength, or whether it was the light intensity factor. They found that "single photons of long, middle and short wavelength elicited identical responses. While the wavelength fixes the probability that a photon will be absorbed, the intensity fixes the number of photons that have a chance to be absorbed. The number absorbed depends upon both variables."²² Thus, according to Baylor, "a rod or a cone informs the bipolar and horizontal cells of only one thing: how many photons it has absorbed in the recent past": thus the information is independent of wavelength, making it impossible for any one rod or cone "to signal separately wavelength and intensity."²³

However, the nineteenth century experiments of Helmholtz and Maxwell had indicated that by using a minimum of three coloured lights from the red, blue and green areas of the visible spectrum, a mixture could be achieved which would produce a colour sensation that would match, when compared, the sensation derived from stimulation by light of any arbitrary spectral composition.²⁴ These results indicated that there must be three different kinds of cone that preferentially absorb wavelengths that are specific to the type of cone, that specificity in turn indicating a difference in the absorbing pigments for each cone. "The essence of colour vision is to sense wavelength and separate it from intensity."²⁵ Baylor also states that it has now been shown that there is only one pigment in each separate cone cell, this singular expression being necessary to separate the response for selective wavelengths. Otherwise, if each cell contained all pigments, "all cells would respond equally and no wavelength information whatsoever would be available in their signals."²⁶

Many researchers were involved in progressing this research field from the mid nineteen-sixties including Brown and Wald at Harvard, and Marks, Dobelle and MacNicholl at Johns Hopkins University. They carried out an experiment whereby a beam of light was shone across a succession of single cones that were placed under a microscope, and the absorption of the light wavelengths measured. It was found that there were three types of cones each of which *preferentially absorbed* in one of either the blue, green or red wavelengths. This research was extended and refined by Bowmaker, Dartnell and Mollon at Sussex University, other workers at Queen Mary College, London, and also by researchers at the University of Cambridge in the eighties. In 1980, Bowmaker and Dartnell's experiment using isolated cells from a human retina achieved results showing that the peaks for wavelength absorption were at 420, 534, and 564 nanometres for cones and at 498 nanometres for rods, thus discovering the basis for human trichromacy.²⁷ In 1987, Nunn, Schnapf and Baylor carried out an experiment in which they used a suction electrode to collect the cell's membrane current. They imaged a 2 μ wide slit of light on the outer segment of a single retinal cone cell of the macaque monkey, and recorded the single photon electrical response elicited by different wavelengths throughout the spectrum. The results showed that it is "the wavelength [that] determines the likelihood that an incident photon will be absorbed."²⁸

In 1986, Jeremy Nathans successfully isolated and identified the genes for the three cone pigments in human cells, and showed that although the pigments were similar to rhodopsin, analysis of the protein structure demonstrated slight differences in the amino acid strings making up the protein of each. One controlling gene was found to have a location on chromosome seven of the human genome, the other two being on the X sex chromosome situated close together. The red and green pigments were found to be 96% identical, leading to the assumption that the X chromosome contained the genes controlling both the red and the green response. This was later confirmed by Merbs and Nathan who inserted the three genes into kidney cells in tissue culture, and were able to show that the cells then each synthesized a cone pigment characterised by preferential absorption as expected for each in the red green or blue regions when tested. It was these findings that also added to the understanding of colour deficiency, the mechanism of this being thought to be faulty duplication at the cell division stage of meiosis during the formation of the gonad cells. In males, who carry only one X chromosome, the effect of the genetic flaw shows in the expression of that genetic message, resulting in flawed colour vision. In this way, the sex linkage of colour deficiency was demonstrated.²⁹

These results taken together confirmed that the cone cells contain three different pigments, all of which are subtly different to the rod pigment rhodopsin, and that each cone pigment is configured so that it maximally absorbs a specific wavelength, thus showing a preferential response to that wavelength. Gordon commented that these researchers have shown that “the three peak cone sensitivities are at 420, 530, and 560 nanometres” and thus that there are indeed cells that can be called “the short-, medium- and long-wavelength colour receptors of the eye,” and so all three must be present for normal human colour vision.³⁰ These insights also provided the basis for knowledge of the human visual system gained in tests that had been carried out in the fifties by Stiles and Burch. In experiments consisting of the matching of a standard intensity monochromatic light with a mixture of the three primary lights red, green and blue that were of adjustable intensity, the cone responses from the two halves of the visual field were appropriately recorded in each case. It was found that when the subject reported a match, the cones in the standard or test half of the field of vision were in an identical state of stimulation to that of the other half of the field where stimulation from the mix of red, blue and green light was occurring. This work also brought out the fact that the intensities of the matching lights related to the wavelength of the test light.

Hypotheses for how the pigments each absorbed photons preferentially were put forward, and eventually the mechanism appears to have been explained. Although retinal is the structure that absorbs light in all cases, whether the pigment is rod rhodopsin or any of the cone pigments, it was found that the slightly different proteins cause individual responses “by modifying the particular wavelengths that retinal absorbs.”³¹ When absorption occurs the electrons in retinal interact with the light wave, capturing its energy, and it is this that influences the distribution of the electrons. Honig and colleagues have suggested that the location of the negative charges in the retinal molecule are critical. Denis Baylor reports that it has now been shown that “the number and positions of negative charges are mainly responsible for producing the different spectral absorptions of the visual pigments. The different behaviour of the red and green cone pigments is explained by the presence in the red pigment of the three amino acids that contains hydroxyl groups whose oxygen atoms behave as weak negative charges,” and that these differences in the protein can, for instance, cause “the electrons in retinal to become more delocalised”, a state resulting in light at longer wavelengths being absorbed preferentially. By contrast, it has been found that the blue pigment protein causes a weaker delocalising effect.³²

How Visual Colour Data is Transported to the Brain

Cumulatively, this research has shown how, after the rods or cones have been stimulated by light that has entered the eye through the cornea, passed through the visual humours and the lens and fallen on the retina, the visual data, which may be viewed as the 'message', is encoded by the receptor cells. For the stimulation to be interpreted as an image, the encoded data or 'message' must be passed from these receptor cells through the intervening neurones to the central nervous system where the stimulation is interpreted as the image. One problem in understanding how this works has been the fact that the retina has length and breadth but the visual cortex, the areas known as 17 and 18³³ of the brain that deal with the interpretation of incoming visual data, has thickness as well. By the second half of the twentieth century, experimenters had found that after the encoded data or 'message' had passed from the retinal layer, it was relayed through a neural structure, the lateral geniculate nucleus (LGN), where it was modified to a three dimensional form. The LGN, (formerly called the optic chiasma) which is derived from the optic lobes of the lower vertebrates, acts as a relay centre. Studies have shown that a point on the retina becomes a column in the LGN. If a line on the retina is illuminated, it can be shown that in the LGN all the cells of an area are firing in a series of parallel columns. If an area on the retina is illuminated, all the cells in the block are firing in the LGN. That is, the mechanism of vision can be shown to be an elaboration of a system whereby the activity of receptors that are arranged in two dimensions is relayed up to a series of neurones in three dimensions. In the LGN, the information encoded from the retina is found spread out, as it is again on the cortex, but it is not evenly represented. It is significant that the encoded information from the area of the fovea occupies a relatively much larger area than that from the rest of the retina, implying the importance to the human species of both the perception of detail and of colour.³⁴

The encoding of the incoming visual data and its transport to the CNS depends upon the structure of the neurones and their physical and chemical function. Ian Gordon has outlined recent understanding of the structure and function of neurones, which are not physically connected. The stimulation to be passed on from one to another depends upon "the strength and timing" of changes that happen at the synapse. When a dendrite reaches a certain threshold of stimulation, the permeability of the membrane changes suddenly, resulting in "a wave of electrical disturbance, or depolarization, which spreads from the site of the stimulation. This wave of electrical disturbance is decremental, tending to diminish with distance." If the stimulus is strong enough to allow the impulse to reach the axon, it will then continue to the end without diminution. If more impulses per second are being sent, this indicates a stronger stimulus. Thus the grade of stimulus is being translated into a

frequency code. Chemical activity at the synapse can transfer the impulse to the next neurone, but on the other hand may inhibit the transfer. The synapse can therefore be conceived as acting in the manner of a logical gate, and thus neurone activity in some ways is comparable to a computing device using a logical gate switching mechanism. This type of mechanism is well suited to change response, and because the visual environment is essentially characterised by changing stimuli, this is an appropriate mechanism for the interpretation of the visual environment.³⁵

It has been found that a physiological fact of human vision is that if several stimuli simultaneously fall on the same receptive field of the retina, the stimuli are encoded by the retinal ganglion served by that receptive field as being one unitary stimulus. Thus if the stimuli take the form of several dots, they are not perceived as being discrete dots but rather as a patch.³⁶ The message sent to the CNS is encoded accordingly. This fact explains why an image printed in a half tone style is interpreted in the visual cortex of the brain as being in continuous tone rather than as being a pattern. The finer the grain of the halftone, the more imperceptible the pattern becomes.

The research of De Vallois showed that the LGN is responsible for transmitting to the cortex information about the light stimulation passed on from the retinal receptors, and that this information is of two distinct kinds – colour information and intensity information. Intensity information is important because it determines brightness and can be specified as the number of photons or quanta (discrete packages by which light energy is transferred) that fall on a given cross-sectional area per unit time.³⁷ This research has also shown that the visual cortex responds in an antagonistic fashion, exhibiting excitation or inhibition according to, for example, an original stimulus of red versus green, thus at this level colour vision is the result of the action of an opponent system fitting in with Hering's concept. Close and cogent explanation of the neurophysiology of colour vision has more recently progressed to examine and explain some of the underlying physical and chemical mechanisms of the causal genes and the working neurones involved in enabling human colour vision. These studies have also confirmed that our vision is partly based on a trichromatic principle.

Intensity Information Enables the Perception of Contrast

Contrast perception is a human ability on which depends the basic principles that have been worked out for many kinds of visual communication; principles that govern effective design: for instance, for all kinds of print products, whether they contain images or textual characters, or both. Denis Baylor has summarised present understanding of the neural

mechanism which underlies this ability, explaining that after neural messages have reached the retinal ganglion cells, the impulses are relayed via the fibres of the optic nerve to the brain in "large, brief signals." Since the frequency of the impulses has been observed to change according to the application of light to the receptor area, it can be seen that "visual signals thus consist of increases or decreases in the frequency of impulse generation." It is also known that particular ganglia respond only to illumination of a particular region of the receptive retinal surface. Another discovery of significance is that colour information is processed by a different set of ganglia to those that encode black and white contrast information. It has further been found that the receptive ganglion field is arranged in two concentric circles that work in an opposing fashion with respect to impulse generation. For example, a certain ganglion may respond to a small spot of light on a dark background, or another may respond to a dark spot on an illuminated background, but both have in common that they signal local contrast, and hence give information concerning abrupt changes in the visual field such as the border of an object. Thus the effect of light stimulation in the one instance is excitation of the receptor but suppression of activity in another. Weisel and Hubel have investigated the activity of the LGN, and have discovered that the cells in this region "have receptive fields that are virtually identical with those of the retinal ganglion cells that drive them," mirroring their concentric and antagonistic behaviour. Significantly, Weisel and Hubel found that intensity (black and white contrast) information from the three types of cone, that is, the red, blue and green signals, are incremental, but that the action of signals resulting from red, green, blue or white light stimulation at the same time actively suppresses signals in the surrounding region. The employment of both positive and negative response increases the overall response range. This overall activity elucidates the way in which intensity information is propagated.³⁸

Colour Contrast Information and the Interpretation of Colour in the Brain

Further research has now shown that wavelength, and hence colour, information is transmitted to the brain by a separate class of cells, and that these cells also work in an antagonistic fashion, as they affect the rate of the firing of impulses to the vision centres of the brain. For instance, one region may have a central area that is more attuned to signals from red cones, while the surrounding area is more attuned to green, thus its response is to show suppressed activity in the face of a green stimulus. It has been found that this antagonistic response is at a maximum for a monochromatic green. Thus the net effect of stimulation of the area, is for the red response in comparison with the antagonistic green response to produce an outgoing signal containing the result of this comparison. This result is thus a refinement of wavelength information coming from the receptors, transmitted in

the firing of the impulse to the brain, and can be thought of as a first step in wavelength inference concerning the stimulus.

Similar mechanisms are found to be operating whereby stimulus information gained from the blue and the green cones is compared. This information came from the 1958 experiments of Svaetchin and MacNichol. (See Fig 5.7 in Gordon p 124) The nature of the selectivity of the synaptic connections controlling the colour-coded receptive fields of the retinal ganglia is not yet fully understood, but it is thought that the bi-polar cells are probably colour specific, and that they collect from only one set of the three kinds of cone cells.³⁹ However, what is known is that the “cells in the visual pathways located inwards of the cone cells use the outputs of these cells and respond differentially to them, producing the sharpening postulated by the opponent-process theory.”⁴⁰ As in the response of the pigments of the receptor cells, it has been found that the information as to the wavelength of the original stimulus is not present per se in the activity of any particular ganglion. Thus for instance, although there is no magenta wavelength, what we perceive to be of a magenta colour is inferred from data obtained from both red and blue light. Groups of ganglia cells carry colour signals from any point on the retinal surface, and in order to extract particular wavelength information, the outputs of the different types of ganglia need to be pooled and compared.⁴¹

It appears, in fact, that separate areas of the brain are devoted to the interpretation of each separate class of visual information, such as perception of form, depth and movement. Further, it is thought that specialised areas may be used to recognise signals that come from such separate visual elements as edges, straight lines, and colours. Study of the LGN has yielded the understanding that the ganglion cells feed the encoded, specifically colour information to a spatially separate area to that receiving specifically black and white information, and that this is also true of the visual cortex in the brain, so that it is known that “colour is processed in regions of the cerebral cortex different from those that handle other types of visual information.”⁴² It appears that brain organisation is along the lines of a parallel pathway layout, so that all information is interpreted simultaneously, and not consecutively in the fashion of a traditional computer, and to this end, neural connections which are vital to the pooling and comparison of data between areas of the brain must be constantly maintained. In 1959, Edwin Land, who founded the Polaroid Corporation, showed that most colours were still able to be distinguished in spite of the absence of stimulation from apparently appropriate wavelengths, thus demonstrating the considerable inferencing power of the brain with regard to colour vision. Land took two black-and-white

photographs of a still life of flowers, one through a yellow filter and one through an orange filter. These pictures were then projected onto a screen through the same filters and in register. Fantastically, instead of being just yellow-orange, the flowers appeared in their full range of colors – reds, greens, and blues. The brain appears literally to invent the missing colors from the clues in the patterns of yellow and orange light reflected from the screen.⁴³

Experiments are now being carried out to image the responses of all the ganglia from a piece of retinal tissue on a computer screen as light is applied to see how this pooling and comparison is done. This work aims to find out what a multi-neuronal colour signal in the optic nerve would look like by analysing the spatial chromatic and temporal patterns.⁴⁴ In the field of colour vision, although many questions remain, experimental work over the last few decades has confirmed that approaches to the understanding of colour vision put forward in general theories have largely been confirmed. Thus, within limits, theories explaining the mechanism of human colour vision of both Young and Helmholtz, as well as of Hering, have been shown to be essentially correct, confirming that the basis of colour theory as it applies to colour printing in the practical sense has generally proceeded in the right direction.

¹ Trevor Lamb and Janine Bourriau, eds., *Colour: Art & Science* (Cambridge: Cambridge University Press, 1995), 103.

² Anthony Mortimer, *Colour Reproduction in the Printing Industry* (Surrey: Pira International, 1991), 21.

³ *Ibid.*, 22.

⁴ Garrett Hardin, *Biology: Its Human Implications*, 2nd ed. (San Francisco: W.H. Freeman and Co., 1957), 242: fig. 13.14.

⁵ Prof. Geoffrey Satchell, unpublished comparative physiology lecture, University of Adelaide, 1961.

⁶ "In 1802 Thomas Young [delivered] a lecture at the Royal Society of London on his theory that the eye responds to only three colours": John Hedgecoe, in *The Art of Colour Photography* (London: Mitchell Beazley Publishers, 1978), 256.

⁷ Helmholtz began to develop Young's postulated theory in 1852 and 1866: Mortimer, *Colour Reproduction in the Printing Industry*, 22.

"The Young-Helmholtz three factor theory (Helmholtz, 1909-1911, translated 1924-25) attempted to explain trichromacy ...", Ian E. Gordon in *Theories of Visual Perception*, 2nd ed. (Chichester: J. Wiley, c1997), 119.

⁸ *Colour Vision* (New Zealand Association of Optometrists, [ca1998]), pamphlet no. 989/10K.

⁹ Mortimer, *Colour Reproduction in the Printing Industry*, 22.

¹⁰ Ian E. Gordon, *Theories of Visual Perception*, 2nd ed. (Chichester: J. Wiley, c1997), 119.

¹¹ Denis Baylor, 'Colour Mechanisms of the Eye', in Trevor Lamb and Janine Bourriau, eds., *Colour: Art & Science*, 103.

¹² *Ibid.*, 112.

¹³ Mortimer, *Colour Reproduction in the Printing Industry*, 23.

¹⁴ Gordon, *Theories of Visual Perception*, 120: Hering's opponent-process theory was published in 1890.

¹⁵ *Ibid.*, 122.

¹⁶ Baylor, 'Colour Mechanisms of the Eye', 107 and 108; fig. 3.

¹⁷ *Ibid.*, 103-125.

¹⁸ *Ibid.*, 107.

¹⁹ *Ibid.*, 109.

²⁰ *Ibid.*

²¹ *Ibid.*, 110.

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- ²² Ibid.
- ²³ Ibid.
- ²⁴ John Hedgecoe, *The Art of Colour Photography* (London: Mitchell Beazley Publishers, 1978), 256: In 1861 James Clerk Maxwell obtained a three-colour image by separating and recombining light.
- ²⁵ Baylor, 'Colour Mechanisms of the Eye', 104.
- ²⁶ Ibid., 114.
- ²⁷ Ian E. Gordon, *Theories of Visual Perception*, 123: fig. 5.6 'Actual Absorption Data Obtained from Isolated Cells from a Human Retina'.
- ²⁸ Baylor, 'Colour Mechanisms of the Eye', 110.
- ²⁹ Ibid., 116.
- ³⁰ Gordon, *Theories of Visual Perception*, 122.
- ³¹ Baylor, 'Colour Mechanisms of the Eye', 119.
- ³² Ibid., 120.
- ³³ Gordon, *Theories of Visual Perception*, 113.
- ³⁴ Satchell, unpublished comparative physiology lecture, 3.
- ³⁵ Gordon, *Theories of Visual Perception*, 114-116.
- ³⁶ Interview with Dr. M.B. Johnston, Psychology Department, La Trobe University, November, 1997. Used with permission.
- ³⁷ Baylor, 'Colour Mechanisms of the Eye', 104.
- ³⁸ Ibid., 120-122.
- ³⁹ Ibid., 122-123.
- ⁴⁰ Ian E. Gordon, *Theories of Visual Perception*, 124.
- ⁴¹ Ibid., 121: fig. 5.5 'A Modern Three-pigment /Opponent-process Model of Colour Vision'.
- ⁴² Baylor, 'Colour Mechanisms of the Eye', 123.
- ⁴³ Augustine Hope and Margaret Walch, introd. by Michel Pastoureau, *The Color Compendium* (New York: Van Nostrand Reinhold, c1990), 242.
- ⁴⁴ Baylor, 125.

GLOSSARY

Part 1: Processes and Other Terms

Actinic Light

The violet and ultraviolet wavelengths of the spectrum that produce chemical changes in photography.

Additive Colour Mixing

An additive colour system is one in which, if from an initial state of blackness, the primary spectral coloured lights red, green and blue are mixed in the right proportions, the full complement produces white light. In such mixing of lights, blue added to green produces cyan, red mixed with blue results in magenta, and red added to green appears yellow.

See also Tri-chromatic system.

Anastatic Printing

A process of transfer lithography.

Aquatint

“Tone etching”, which produces a broad water colour effect. Copper or zinc plate is cleaned as for etching. Aquatint ground is prepared by sprinkling powdered resin onto the plate. The plate is heated to melt the resin to give a porous ground through which the acid attacks the plate. The design is transferred to the cold plate by tracing over carbon paper or with direct pencil applied to the plate.¹

Autotype

Used to illustrate English books from the late 1860s, autotypes were carbon prints made by a process that was an improvement on Swan’s method. The Autotype Company made many art reproductions by this process, but the autotype had the disadvantage that shrinkage occurred in the drying stage. However, “the autotype version of 1871 had the advantage of a wider range of colours than was available for the albumen prints, and its prints make a good match with the originals.”²

Carbon Print

Prints made by Swan’s method.³ In 1864, Joseph Swan patented a process that made use of carbon tissue, which was a light sensitive paper, to print toned photographic images by means of which copper plates could be etched.

Calotype

Means 'beautiful picture'. Fox Talbot used the light sensitive substance, bichromated gelatine, to produce negatives from which he made paper prints known as calotypes.

Chiaroscuro

Means 'clear-obscure'. A process developed in Europe in the early sixteenth century. Gives light and shadow effects to printed pictures by means of tones or tints "in the shape of broad masses of colour, produced by surface-printing from woodblocks...not intended to stand by themselves, but applied for the purpose of colouring an outline woodcut."⁴

The later process of aquatinting is similar but, in a pure form, does not have the outlines.

Chromolithograph

The term chromolithograph is usually applied to a lithograph printed in three or more colours, each applied from a separate stone. Much of the complexity of chromolithography is due to the fact that it requires perfect registration and a sophisticated understanding of colour.

See also Tinted Lithograph; Hand-coloured Lithograph.

Chromolithography

A colour printing process: one of the most successful systems of colour lithography.

Patented by Godefroy Engelmann in 1837, it displaced the complex Baxter process.

Bamber Gascoigne considers that "the distinction between chromolithograph and colour lithograph can never be anything other than a value judgment, the printing method being the same...however, the term chromolithograph remains useful to describe a historically significant and easily recognisable tradition of commercial colour lithography..."⁵

Chromoxylography

Another name for George Baxter's nineteenth century colour printing process of 'Polychromatic Printing'. A mixed process employing both old intaglio and new lithographic techniques in which printed colour is applied from woodcuts or wood engravings. The colour is higher than for chiaroscuro. Instead of using wood for the key block, Baxter substituted metal, either copper, steel or zinc, which had been prepared by using tone-producing processes such as mezzotint, aquatint, or engraving. Occasionally he used a lithographic stone as the key, with tiny marks to indicate the colour boundaries. Impressions were taken on wood blocks (or metal)⁶ one for each colour to be used, and these were separately engraved.⁷ The first impression was taken in monochrome, usually in a neutral colour such as grey or terracotta, and the rest of the colour was successively added from the blocks, usually requiring from ten to twenty printings, but occasionally thirty.⁸

Collotype

This planographic process gives a continuous tone reproduction result of high standard without the use of a screen. It is the most faithful reproduction method but is more expensive than photolithography. "The secret of the process is the fact that a film of gelatine and potassium bichromate hardens when exposed to light and, after damping with water, takes ink only on the hardened parts."⁹ Now only occasionally used for high quality reproduction of artwork, paintings in particular. The distinctive grain produced is characteristic of the process. Heliotype is a similar process.¹⁰

"The first collotype printers used lithographic presses"¹¹ but platen presses, such as an Albion or a Columbian, could also be used. Steam presses were available for collotype by the eighteen eighties. Geoffrey Wakeman has stated that pressure applied from a roller increased the plate life by four times compared to the wear from lithographic presses where pressure was applied by means of a scraper.

Colour Print

A print that has actually been printed with inks of different colours.¹²

Colour Printing

For this thesis, colour printing is taken to mean printing in one or more colours other than black.

Composition Roller

A roller that takes surplus ink from the litho. Similar to a letterpress roller.

Compound Plate-printing

See Congreve Process.

Congreve Process

Technique of compound plate-making used by Congreve (Ibbetson hinted that Congreve had copied him) for colour printing especially of bank notes to prevent forgery. A relief block was divided into a number of parts, each inked with a separate colour and then fitted together to print at one pull of the press. "Congreve patented a system and machine between 1819-20, for printing the backgrounds of bank-notes in coloured patterns. A plate made of two kinds of metal and engraved with a design for relief printing was capable of being separated, inked with different coloured inks and brought together again in one plane for printing at a single impression."¹³

See Also Congreve's Machine (Part 2).

Copper Plate Engraving

See Engraving

Crayon Engraving

See Engraving

Cyan

Means dark blue, from the Greek kyanos. Cyan is the blue-green colour used especially as one of three standard subtractive primary colours for three colour printing, the others being magenta and yellow. Such printing is often referred to in an abbreviated way as CMY. In an additive colour system, cyan is the “secondary” colour produced by mixing red and blue.

See also Trichromatic System.

Daguerreotype

In 1837, Louis Daguerre used a photographic method to fix a reversed image on metal, by coating a metal base with bitumen of Judea and exposing it to light under copied engravings. Although the resulting daguerreotypes proved difficult to etch, they were sometimes used in England as originals from which wood engravings were made for illustrative work.

Del. (or Delt.)

Means ‘drew’, as in drawn, as opposed to painted. But ‘del’ may be used of a draughtsman who copied a painting to make a more portable image from which a print is later made.¹⁴

Del. is an abbreviation of the Latin *delineavit* = he drew it.

Dye

A dye is the colour produced in a substance by saturating it with a colouring agent, tint or hue, such as a coal-tar or metallic colour, which may be dissolved in a medium to use as in the manner of a stain or ink.

See also pigment; ink.

Eckstein Process

The Eckstein process provided for the lithographic printing of multi-colours via a three-colour process in which the colour was applied from three stones, one for each of the “primary” colours, red, blue and yellow. “All the shades of one color were printed from one stone, whereon a parallel line screen of uniform density had been drawn mechanically and subsequently etched.”¹⁵

Electrotype Plate

A duplicate letterpress cast from a mould which can be a group of wood-engravings, line and halftone blocks together with type locked in the same forme, or from a metal mould. Discovered in 1839, ‘electros’ began to take over from stereotyping especially for the duplication of wood engraved blocks, superseding it by the eighties. This preserved the

original wood block. However, the dubious advantage over stereo plates for some illustrative work was expressed by J. S. Hodson in 1884: "Stereotyping, however useful for type work and for ordinary printing, is quite out of the question for art work, as notwithstanding all modern improvements the results are too chancy for anything requiring sharpness and delicacy in the results."¹⁶ Useful for a finer standard of work for halftones—for screens of 120 and finer. But for colour work—for a set of colour blocks—register is important, the shrinkage usually associated with stereo is not wanted.

Engraving

Copperplate Engraving

"Copper engraving was principally used for reproductive work, a practice that continued in the nineteenth century. Intaglio plates, however, suffer from two disadvantages for book illustration: they are difficult to integrate with a text printed in relief, and they are expensive. Copper plates were generally first etched, and then gone over with a graver of lozenge cross-section to produce lines of varying depth and width. Before printing, the plate was warmed on a stand over a brazier filled with charcoal, later replaced by a spirit lamp, and later still by gas heating, introduced by Thomas Brooker about 1840. The plate was then printed on a rolling press."¹⁷

Crayon Engraving

Eighteenth century crayon engraving was combined with stipple work. "Tools known as roulettes [were] used which have toothed wheels with different kinds of grains to match the various textures of the actual lines of a chalk drawing." In crayon and stipple, preliminary work is done through an etching ground, after which etching is carried out, and then further work on the plate is accomplished directly with the burin.¹⁸

Steel Engraving

Largely replaced copper engraving for book illustration during the 1820s and 1830s, and after 1837 copper engraving was little used for this purpose. Various methods were tried but it was Warren's method that was eventually adopted. "By the middle of the century plates of uniform consistency and not subject to warping could be supplied 8/100 inches thick, and any degree of hardness required by the artist could be supplied."¹⁹

Wood Engraving

Instead of engraving on the plank face, towards the end of the eighteenth century Thomas Bewick began to engrave on the end of the plank, where the wood was much denser, and hence did not splinter as easily. As well, he devised a system of white line cross hatching for rendering fine detail. Wood-engraving emerged as the standard for producing pictures to be printed with type. Copies could be made by stereotyping (taking casts in lead.)

Ephemera

Printed matter (for example, theatre programs, posters, guidebooks) meant to be of use for only a short time but often preserved by collectors.

Etching

Developed from 1500 onwards, etching was a less laborious substitute for engraving. The etcher does not have to cut into the copper plate as does the engraver. The lines are not cut, but eaten, or etched, by acid. The copper plate is first covered with an acid-resistant ground, which has been of various combinations of wax, asphaltum, varnish, and other substances. Etching ground needs two properties; it must adhere to the copper and it must resist the acid."²⁰

See also Rolling Press (Part 2.)

Forme

The forme consists of the set type and blocks assembled into pages locked in the chase or metal frame on the bed of the press ready for printing. "The pages are imposed within the chase, and then held in position with strong pieces of wood (furniture) and wedges (quoins)."²¹

Four-Colour Process

Full colour printing from plates produced by photographic separation into subtractive "primary" colours to be printed in cyan, magenta, yellow; plus black.

Fust & Schöffer Process

"The Fust and Schöffer initials are so clean and precise that the conclusion has been reached that each initial was made up of a basic relief block with each element to be coloured engraved on a separate thin metal plate which could be inked separately and dropped into its place in the surface of the block."²²

See also Colour Printing and Presses. (Part 2.)

Gift Book

Rudolph Ackermann, the German artist and publisher, who had come to London in 1795, was the first to offer gift books in the early nineteenth century. They were usually annuals published for the Christmas market intended as presents mainly for women. "The typical early nineteenth century gift book contained an almanac, blank pages for use as a diary, short pieces by eminent writers and high quality illustrations."²³ Giftbooks in the second half of the nineteenth century were few, but in the twentieth century they again appeared up to

the Second World War, often containing photomechanical colour reproductions by such artists as Dulac and Rackham.

Gravure Printing

See Intaglio Printing

Half-tone

A photomechanical system that enables, by use of a screen, the reproduction of continuous tone pictures with a finished appearance that resembles a photograph. First developed in the late nineteenth century, the original is photographed through a mesh screen which "has the effect of dividing the picture into tiny dots, which are then etched to different depths to produce the tonal variations."²⁴ According to the fineness of the screen the dots are more or less invisible to the viewer of the final printed result.

See also Relief Blocks.

Hand-coloured Lithograph

This is a single-color lithograph on which non-printed colour has been applied.

Hand-coloured Print

A print that has been printed in ink of one colour and has had extra colouring added by hand.

Heliotype

See Collotype

Intaglio or Gravure Printing

This type of printing is opposite to relief or letterpress printing and cannot be produced with letterpress machines. Ink is taken from the sunken parts of the plate. After the plate has been prepared (this stage is now executed by photographic means) the ink is applied. The surface of the plate is then wiped (doctored) to take the surplus ink from the surface. "The plates are prepared in much the same way as relief blocks, an acid-resist protecting the necessary parts, in this case, those which are not to be reproduced. There is no screen, but a grain is necessary so that the etched parts will hold the ink, and this is discernible under a glass."²⁵

Ink

Ink is fluid containing colouring matter in suspension, used for writing or drawing. Inks usually have staining power without body, but printers' inks are pigments mixed with oil or varnish. Transparent inks do not have body colour, and can be used to obtain fine tonal gradations by superposition. Until the late nineteenth century, ink was made of linseed oil and lampblack (the colour.) Lampblack was replaced to produce other colours, for example,

ground vermilion to produce red. Quality of ink depends on quality of ingredients, especially of the oil base, which was often not as good as it could have been. "There were specialised ink makers, but until the mid-nineteenth century, many printers made their own ink, which was indeed the source of many of the problems of quality."²⁶

Lithographic Ink

"The variations in the tone of the lithographic washes depended primarily on the density of the ink used for the drawing on stone...it was not easy to assess the strength of these tones."²⁷

Jobbing Printing

This is the name for the printing of ephemera, or "all material other than books, newspapers and magazines...It is now the mainstay of all but a few very large printing houses."²⁸ Job work can be the source of quickly earned income.

Letterpress Printing

See Relief Printing, under Printing.

Line Block

A Line block is one which produces a line result, that is, not a half-tone. (Called a 'linecut' or 'line-engraving' in the US.)

See also Relief Blocks

Lithography

Lithography is a planographic method of printing which is based on chemical principles. It was discovered at the end of the eighteenth century by Senefelder, and "depends for its effect upon the antipathy between grease and water: a greasy image on a surface of smooth limestone is first moistened and then inked; the image repels the water but accepts the ink, while the stone accepts the water and consequently repels the ink."²⁹ By the mid-nineteenth century metal plates, especially of zinc, were used instead of stone, giving versatility, and enabling the imitation of most existing processes. Lithography has been adapted to metal plates by rocking the plate with a powdered glass to obtain a fine grain "on which a fatty acid is held."³⁰

See also Transfer Lithography

Lithotint

The process of lithotint was the outcome of the "collaboration of Hullmandel and Harding in their search for a method by which the latter, and after him many others, could draw on the stone in much the same way that they could paint with water-colours on paper."³¹

Matrix

A metal mould used for type casting. Also applied to “any surface which is used as the physical base from which images are printed eg. etching plates, lithographic stones and woodblocks. Also called ‘the printing element’ ”.³²

Magenta

Purplish red. A derivative of coal tar, magenta was an early synthetic dye and was named in 1859 after a French victory over the Italian town of Magenta. It is one of the colours in a trichromatic colour printing system (CMY), the others being yellow and cyan.

See also Trichromatic system.

Mezzotint

Mezzotint is a laborious intaglio method, developed in Holland in the seventeenth century, and widely used in England, where it was known as *manière anglaise*. Mezzotint enables the engraver to achieve “a rich gradation of tone” and considerable subtlety of shading. Mezzotint was used largely before the advent of half-tone for monochromatic reproduction of prints after paintings, and was used by Le Blon for his multi-coloured method.³³

Nature Printing

“Printing directly or indirectly from something which was not in the ordinary way meant for printing, like a piece of lace, a feather or a leaf, instead of making a drawing or engraving by hand.”³⁴

Indirect Nature Printing

The impression from the object is taken onto metal or lithographic stone; that is, made into a printing surface from which a much greater number of impressions can be taken. These are known as nature prints.

Offset Lithography

A lithographic process in which the inked impression is first transferred from the printing surface to a rubber blanket before finally being transferred (offset) onto paper. From a printed image “it is not possible to distinguish from inspection whether a lithographic impression has been taken by direct or indirect means.”³⁵

Offset Relief Plate Printing

Variously called: offset letterpress, dry offset, letterset, or indirect letterpress.

Osborne's Method of Photolithography

See Photolithography.

Perfecting

Perfecting is a technical printing term for the process of printing the second side of a sheet when the first side has already been printed.³⁶

Photochromolithography

Photomechanical chromolithographic colour printing resulting in a colour image resembling a photograph in colours but prepared using a combination of photographic and lithographic means.³⁷

Photography

Originally developed by Fox Talbot, photography “can be regarded as a kind of printing since it allowed for the multiplication of identical copies of an image.”³⁸

Photogravure

This is a photomechanical ‘intaglio’ printing process in which the impression is taken from a pattern of recessed dots (or cells) of varying depth. It came into use “as perhaps the most suitable process for printing illustrated magazines with very large circulations and other pictorial work required in vast number,” but not until after World War I.³⁹

Photolithography

This is a photomechanical version of lithography. Developed as early as 1850, it is a process of printing from a plate that has been prepared by a combination of photographic and lithographic methods. A useful process for reprinting books for which no plates or type are available, it was later used in conjunction with offset lithography. “Various methods have been developed by which plates are prepared direct from letter matrices, so eliminating all use of metal type.”⁴⁰ Bamber Gascoigne points out that for an impression resulting from either photolithographic or photozincographic processes, it cannot be distinguished by inspection whether an image has been originated on transfer paper or whether it has been originated on another surface prior to its photographic transfer “to sensitized gelatin”. If the image was created in the last decades of the nineteenth century, “it becomes increasingly likely” that transfer was effected via photolithography.⁴¹

Transfer Method: invented in 1857, it was better than previous methods.

Outline of method:

Cover the paper with a film of flour paste (starch), immerse in a weak solution of bichromate, expose under a negative to light, wash to remove the unaltered starch (those areas of the film which were not affected by light), dry, iron with a hot iron to harden the exposed areas: the ink adheres only to the image areas altered by light, and transfers to the lithographic stone.⁴²

John Osborne's Method of Photolithography

Coat paper with albumen, polish by passing the paper through the press (rolling or lithographic), coat with bichromated gelatine, expose, ink, float the paper on boiling water to loosen the unaltered gelatine (ie. that part not exposed to light); sponge away so that the outline of the image is left.

Photomechanical Process

A general term covering the whole activity of converting original material into reproducible form by photographic, chemical, and mechanical means, and subsequently printing from the blocks and plates so generated. The first such process was developed for intaglio printing, although the best intaglio process, photogravure, was not in use in England until 1879, under the name of photomezzotint.⁴³ In the last two decades of the nineteenth century, its application to the relief illustrative processes, first to the line block by Gillot, and then in conjunction with the introduction of half-tones, caused a transformation in the way most illustrated books were produced. In essence, a light-sensitive coated metal plate was first exposed to light through a photographic negative, and the image developed. "The unprinted area is etched away chemically, while the image protects the surface beneath it. What remains is a relief plate with the lines of the image raised above the surrounding areas."⁴⁴

Photozincography

See Zincography

Pigment

A pigment is a colouring substance which, finely ground and held in suspension in a medium, constitutes a paint. It thus has body, as distinguished from a dye or ink which does not have body in itself, but which may be used to create a pigment by combination with a substance that can be ground.

See also Dye; Ink.

Planography

The printing and non-printing areas are in the same plane of the printing surface.⁴⁵ In both relief and intaglio printing processes printing and non-printing areas are physically defined whereas in planographic processes the printing and non-printing areas are separate because of chemical differences.

See also Collotype; Lithography.

Plates

From 1822, steel plates were used for longer runs, and from 1840, copper plates could be steel-faced.

Plates for Block Printing

In 1882, John Southward commented in *Practical Printing*: "It is necessary that these should be made with great accuracy, and this is a serious drawback to most work of this kind, for mathematical exactitude is necessary, and the word 'almost' must be banished from the mind of the operator. Wood is subject to the atmospheric changes; a storm or sudden alteration in temperature, the dampness or dryness of the printing office, all affect the wood, and sometimes to a very considerable degree. A storm, followed by a sudden cooling of the atmosphere, may cause such an extension in a single night that the work already completed will not agree with that which is to follow; and we have known cases in which it has taken days of laborious experiments, by exposing the blocks to different degrees of temperature, to reduce them to their original dimensions. It is better therefore to use plates in metal, and to make a stereotype from the original engraving to serve as a base for the blocks from which the colours are to be printed."⁴⁶

Poitevin Process

Around the time that Fox Talbot had been experimenting with halftone screens in the early 1850s, the Frenchman Alphonse Poitevin had discovered that bichromated gelatine hardened on exposure to light to become not only less soluble, but water repellent in a similar way to the lithographer's greasy crayon as well. Thus if the unhardened gelatine on a bichromated gelatine coated plate was washed away after exposure through a photographic negative, the resulting image accepted the ink.

Primary Colours, as Applied to Printing

The printing of one colour over another constitutes a subtractive mixture. In the (subtractive) mixture of pigments, "primary" colours are said to be those three colours other than black, white and grey no two of which can be mixed to produce the third but which together can produce all possible hues. If pure spectral yellow and pure spectral blue are mixed, white results. In practice, because pigments are almost never pure, in subtractive printing such a result is not obtained. Rather, if yellow and blue pigments are mixed, green results. This is because the blue pigment reflects green light as well as blue light, and the the yellow pigment reflects green light in addition to the yellow light. When the blue and yellow pigments are mixed, the blue and yellow hues neutralise one another and "only the green which is common to both remains."⁴⁷

Print

A print is in essence a pictorial image which has been produced by a process which enables it to be multiplied. This in turn implies the preparation of a printing surface.⁴⁸ Stannard

described and illustrated over 150 ways of commercially producing prints. The print can pivot between a means of artistic expression and a vehicle of knowledge.
See also Colour Print; Hand-coloured Print.

Printing

Printing itself has been defined as being “the transfer of ink (or some other substance) by impressing of one surface against another (may lead to multiplication)”⁴⁹ Thus a printing history may include a study of not only the major classes of print objects, the books, serials, and newspapers that can be given an overall classification of printed reading materials, but also of other productions that have come from the press, such as prints and maps, as well as the plethora of printed matter such as pamphlets, posters, stamps, banknotes and other ephemeral items that have largely resulted from the field of jobbing printing. “An essential stage in some, but by no means all printing, is the assembly of prefabricated or otherwise predetermined characters (letters, numerals etc.) that relate to a particular written language or set of languages....Many printed items involve multiplication, impression, and the assembly of prefabricated characters, but none of the three is essential to printing.”⁵⁰

Printing Processes

Relief Printing:

The impression is taken from a raised portion of the printing surface, as in printing from, for example, a woodcut, a linocut or a type forme. Relief printing is used by the letterpress printing trade.

Planographic Printing

Means same plane printing: the impression is taken from a flat surface treated chemically: lithography is an important form which depends upon the antipathy between grease and water. The printing surface is prepared so that the image area is greasy and attracts ink, while the non-image area absorbs water and so repels ink.

See also Lithography, Collotype.

Intaglio Printing

The impression is taken from recesses in the printing surface: the whole surface is inked and then wiped to leave ink in the hollows, from where it is transferred to the printed item. It is often used for artistic work, pictorial prints, illustrations and refined decorative work.

See also Engraving, Etching; Photogravure.

Printmaking

The craft of print-making has been characterised by the “close relationship between the origination of an image and the manufacture of the printing surface.”⁵¹ The forms of printing mainly used by artists to create prints by hand were wood engraving, etching, and

lithography. (In the twentieth century commercial processes of screen-printing and xerography have also been commonly used to manually produce prints.) Craft printing is associated with the multiplication of copies without presses or with hand presses, rather than with the printing machinery usually associated with the commercial printing industry. Artists prints are usually produced in limited editions. The nineteenth century hand presses are still in use for craft purposes. Iron platen, rolling and lithographic presses are used by print makers, but private press printers use the iron platens. (The nineteenth century presses were still used industrially into the twentieth century for proofing purposes.)

Process Engraving

Making a letterpress printing plate by printing down a photographic image onto a plate and etching it to form a relief printing surface.⁵²

Proof

Taken to mean an impression of a print pulled to check on printing progress before final plate publication.

Rainbow Printing

A nineteenth century colour printing process used to produce multi-coloured prints by both letterpress and lithography. The printing surface was prepared by passing a roller charged with a range of colours over it, thereby using a minimum of effort to produce a maximum effect.⁵³

Reading Matter

Taken to include the following categories of print objects: books, pamphlets, periodicals and newspapers.

Register

Two or more print impressions in their correct relationship on a sheet; hence the terms 'in register,' and 'out of register'. In *Practical Printing* (1882) John Southward commented on register for colour printing: "This is the cornerstone upon which must rest all printing in colours, and it is this which gives typography an advantage over lithography. Thus the typographic impression is made by a stroke, dry and straight, while that by lithography is executed by a friction which stretches the paper by a movement more or less considerable in proportion to its thickness and accuracy."⁵⁴

Relief Blocks

An important commercial application of photography to printing was the invention of line blocks and halftone blocks. A combination of photography and chemical etching replaced

wood-engraving by the end of the nineteenth century, tending to divorce artists from the print production processes.⁵⁵

See also Half-tone; Line Block.

Relief Printing

See Printing Processes.

Steel Engraving

See Engraving

Stereotyping

This is a process whereby an exact copy of a printing surface is produced. Used from the early nineteenth century onwards, especially for relief printing, stereotyping preserves the original, with impressions being taken from the copy, or stereotype. From a mould that has been made from the printing surface, one or more stereotypes are cast. Stereotypes are useful for reprinting as they can be stored after the original formes have been redistributed. Stereotyping proved useful to rotary printing since the stereotypes could be curved for fitting to rotary press cylinders.⁵⁶

Stereo or Stereotype

Duplicate letterpress plate cast from a mould, customarily made from a paper mâché mould (flong) which is made first from a metal relief printing block. The papier mâché mould is put in a heated press and baked hard to produce a matrix. The matrix is put into a casting box and from this the stereo plates can be cast from molten stereo metal. (The process is not suitable for wood blocks as the heat would split them, and open up joints between the blocks.)

A stereo for woodblocks can be made from a plaster mould of the original that can be a group of wood-engravings, line and half-tone blocks, together with type locked in the same forme. Special plaster on dampened paper placed on the forme plaster-side-down in a hand press is lightly pressed and dried. The plaster cast is broken when the plate is removed and therefore only one stereo per mould can be made. Good results are obtained for half-tone screens up to 150.⁵⁷

Subtractive Colour Mixing

This means the reproduction of colour by mixing or superimposing inks, paints or dyes, as distinct from 'additive colour mixing'. In effect, all applications of ink or other colouring to a surface such as white paper subtracts (absorbs) some portion of the white light falling on it.

Swan's Process

See Carbon Print.

Tinted Lithograph

"Unlike the single-color and hand-colored lithographs, which require only one stone, the tinted lithograph involves two or three stones, though seldom more. The image is still printed from just one stone, but one or two tints that flood across the picture surface are printed from second and third stones. The tints thus create atmospheric effects rather like water-colours but do not make up the image itself."⁵⁸

Transfer Lithography

In essence this is a process whereby the lithographer's drawing on paper was transferred by running it through the press face down on the stone: lettering did not need to be laterally inverted. First described by Senefelder in 1819, it enabled the printing of both pictures and writing from the stone, but lithography "took time to develop its own graphic identity."⁵⁹ After this there was a proliferation of methods. Presses specific to the purpose were developed later.

See also Lithography.

Trichromatic System = Three Colour Process

This is a means of colour reproduction using three colour instead of four-colour separation. The three-colour process is essentially the same as the four-colour process except that there is no separate black printing. It consists of the successive printing of three basic colours. All other colours are formed by mixing as the process proceeds.

"Three colour process is based on the earlier scientific work of Newton and worked on in the mid-nineteenth century by Clerk Maxwell. When adapted to printing, three blocks were employed, representing the 'primary' colours. The negatives for these are taken through filters of coloured glass or glass cells containing coloured liquid in addition to the ruled screen...Each of these light filters allows only certain colours to pass through to the negative and stops the passage of all others. The colours of the original are thus automatically dissected and grouped in three categories representing approximately the yellows, the reds and the blues, each of which is contained in a separate negative."

Three process blocks are made from the negatives. The block representing the yellow tones is printed first, in yellow ink, the red block (magenta) is next printed over the first impression and then the blue (cyan). The various colours and tints in the final picture result from the three press passes and are formed as the overprinting allows combination.⁶⁰

Important variables to be controlled are amount of colour, degree of pressure and register. The tri-colour printing system of cyan, magenta and yellow is often abbreviated to CMY. See also Primary Colours, as Applied to Printing.

Tympan

A hard paper covering the platen to provide support for the sheet of paper being printed.⁶¹

Vignette

An ornamented design in a book, especially at the beginning and end of a chapter, usually small, and having the edges shaded off.⁶²

Woodburytype

A name for a form of early photograph. "Similar to a carbon print but mass produced by pouring the tinted gelatin into a mould."⁶³

Woodcutting

In the process of wood-cutting, the cuts are made on the face or plank surface of a softer wood rather than on the end of the harder boxwood as for wood engraving. "The masses or printing surfaces are cut around with a knife, and the whites are cleared out thereafter with gouges and chisels."⁶⁴

Wood Engraving

See Engraving

Wood Block Printing

See comment under Plates

Yellow

The most reflective and luminous of primaries, yellow must be pure to retain its colour, but is easily adulterated. For example, a small contamination with black can give it a greenish appearance. The human eye has its greatest visual acuity in yellow light, therefore, for efficiency of sight, sodium light is best, although not good for colour vision. Yellow is one of the three colours in a trichromatic (CMY) printing system.

See also Trichromatic System

Zincography

In the nineteenth century zincography meant printing from a zinc surface bearing an image produced by drawing with lithographic ink or created by photographic transfer from an original (photozincography), and, for a larger edition, subsequent transfer to the more durable printing plates which were prepared to render them water repellent, and then lightly engraving or etching with a steel needle where ink retention was intended.⁶⁵

Part 2: Printing Presses

Rather than being a formal classification of printing presses the following notes are intended to provide information concerning types of presses, especially those used in connection with the different classes of colour graphics printing during the study period.⁶⁶

General definition: "A printing press is "a mechanical arrangement for taking impressions from an inked forme on paper or some other material. According to the principle of printing adopted a distinction is made between presses for intaglio, lithographic and letterpress printing."⁶⁷ Printing presses have developed from the first presses of the fifteenth century to the modern printing presses of the twentieth century, and from the trade point of view can be seen to fall into two major groups: hand presses and the later powered printing machines. Within each group presses were built to suit the various styles of printing.⁶⁸

Geoffrey Glaister has said: "Printing presses may also be divided into the following main types according to the manner of applying the paper to the forme: *platen* presses, in which the paper is pressed by a flat surface onto a flat forme; the *rubber* [scraper] press, in which the forme is also flat, but the pressure at any given moment is exerted only on a narrow strip of the paper by means of a rubber blade which is moved over the paper as it rests on the forme; the *cylinder* press, in which the paper is pressed on the forme by a cylinder which rolls over it; and the *rotary* press, in which both the surfaces pressing on each other consist of cylinders between which the paper is conveyed in sheets or an endless web."⁶⁹

Albion Press

See Hand Press; Platen Press

Baxter's Presses

Discussed under Colour and Printing Presses

Century Press

See Cylinder Press—Two-revolution

Colour and Printing Presses

Baxter's Presses

George Baxter used a Stanhope and a Cogger Press (hand presses), as "he was convinced that the vibrations of the cylinder machine would prevent the accurate superimposition of each block in the process."⁷⁰

Chromatic Printing Press

Patented by Switterlin Claussen and Co. of Chicago and New York in 1871, this press, of the job platen type, was typical of the many patents taken out in the second half of the

nineteenth century for printing in several colours simultaneously, in this case from the arrangement of several rollers. The speed ranged from 1,000 to 2000 impressions per hour, the higher output achieved by the use of steam power as opposed to treadling. In 1871 Dunk also invented a Chromatic press in Philadelphia that carried the sheets from one colour cylinder to another until up to five colours had been applied. Using two inking discs to supply different coloured ink to each half of the rollers, Rutley's two-ink colour table was in use in Britain around 1879. Many similar machines were invented often employing split ink ducts.⁷¹

Hopkinson's Improved Albion Press

Typical of the hand presses used for "fine colour work" all through the nineteenth century.⁷²

Knight's Presses

Charles Knight envisaged several presses for colour printing. For example, for printing four colours in succession "the blocks were fixed on four beds hinged to the sides of a square table which were turned backwards to be coloured and downwards for the impression." Provided by the rising of the table this was controlled by a system of levers and screws. "Each bed with its attachments was counterbalanced." Knight printed one colour on top of another rather than several colours at one impression.⁷³

Lambert Press

The Lambert press, which was French, consisted of four beds, and the same number of ink slabs, sets of rollers and impression cylinders. After the sheets had been fed in, they were

Columbian Press

See Hand Press; Platen Press

Common Press

See Hand Press; Wooden Press.

Congreve's Machine

A machine designed by Congreve "in which the surfaces descended to different levels to be passed over by inking rollers connected with separate ink ducts and which united on rising to form the single printing surface."⁷⁷ The machine was used for 'security' printing such as banknotes and duty labels.

See also Congreve Process.

Cylinder Press/Flat-bed Cylinder Press

A printing machine using an impression cylinder as distinct from a platen press, and having a flat printing surface as distinct from a rotary press. The forme is placed on a flat bed "which travels under the inking rollers and a rotating pressure cylinder."⁷⁸ Sheets are lifted from a stack on the feedboard and put on the cylinder which revolves, pressing the paper on the inked forme as it passes by underneath. "The cylinder machine was responsible for a change in the labour structure of the printing trade, a change speeded up by the arrival of the rotary press, although the pressman continued to exercise the 'mystery' art of printing. Problems unthought of in hand printing had to be tackled and the use of power very gradually began the transformation of a trade into an industry."⁷⁹ Over a long period of time there were two successful versions:

Koenig's Cylinder Machines:

Early power-driven cylinder presses developed by Frederick Koenig over the period 1810-1812.

Stop-cylinder Press:

This type of press stopped to deliver each impression after it was made and before the bed returned to the other end.

Wharfedale:

A stop-cylinder machine developed by William Dawson and David Payne of Yorkshire in 1858. This press had a flat bed that carried the forme which passed under inkers before reaching the paper bearing cylinder.

Two-revolution Press

"The Miehle, Century and other American machines of the two-revolution type were found to give much more perfect register and increased inking power, which was all in favour of the three colour process and English and German machine makers soon followed on the

same lines.”⁸⁰ The two-revolution press has a continuously revolving cylinder that rises slightly after each impression “to let the bed return...To guard against set-off, (the impression made on the back of sheets of paper by the wet ink from the next) the finished sheets may be interleaved with paper or sprayed with a suitable liquid or powder. The advantage is that whereas stop-cylinder machines deliver around 3,000 impressions per hour, the two-revolution machines can print from 3000-5000 sheets per hour.”⁸¹

Miehle Press:

The Miehle two-revolution machine was invented in Chicago in the 1880s: it was a heavy duty press used for registered colour work, and for fine cut work. There were “a range of sizes which related to book and paper sizes in common use.” (Improved versions were still being used in the 1970s and beyond.) In 1884, Robert Miehle solved the problem of controlling the reversal of the heavy reciprocating bed “with a gear which was powerful enough to control the forward motion of a massive bed.”⁸² The first machine to his design was built in 1887 and in it the cylinder revolved continuously, being raised after each impression to clear the forme during the second revolution. The Miehle, which had great impressional strength, accurate register and durability, took the lead in the type of machine. With the development of printing from half-tone blocks, followed by process colour printing, such a machine was needed, and it kept its lead for some eighty years.”⁸³

Tandem Miehle Press

This press consisted of three machines joined together, with automatic delivery to the next. The problem was that there was not sufficient drying time between impressions, therefore it was not good for heavily inked formes.⁸⁴ In the nineteenth century “it is probable that most books were printed on flat-bed machines, either the two revolution or stop cylinder types, particularly after 1858 when the Wharfedale became available.”⁸⁵

L & M Miehle:

Miehle design presses that were manufactured by the Linotype and Machinery Ltd. company (L & M) of London.⁸⁶

Miehle Vertical Press:

“The Miehle Printing Press and Manufacturing Company, of Chicago, also became well known for a novel automatic stop-cylinder press, the invention of Edward Cheshire, of Milwaukee, in 1920. In effect, this was a flatbed cylinder machine standing on end, with feeding and delivery carried out horizontally.” The first was built in 1921, and became popular, with a delivery speed of around 3600 impressions per hour. This was improved to 4500 per hour by 1931 and then to 5000 per hour by 1940. Manufactured by the Goss works in Preston from 1952 to 1968, a modernised 1964 version was the V50X Extra-Vert.⁸⁷

See also Hand Press; Powered Press

Etching Press

See Rolling Press

Flat-bed Cylinder Press

See Cylinder Press

Hand Press

Before steam power was able to be harnessed to drive printing presses, “the inking of the forme, the feeding and extracting of paper, and the application of pressure was done by hand.”⁸⁸ Hand presses were developed for all styles of printing, and ranged across the platens, lithographic, cylinder and rolling presses. Each type of hand press is further discussed under these general headings. As powered presses gradually took over in the nineteenth century for commercial printing, many surviving hand presses remained in use for craft purposes. Others remained in service as proofing presses. Well-known examples were the Albion, Columbian and Stanhope.

Hoe Press

See Rotary Press

Hopkinson & Cope Power Platen Press

See Platen Press

Hopkinson’s Improved Albion Press

Discussed under Colour and Printing Presses

Intaglio Press

The early intaglio press was the rolling press. It was “initially made of wood, but from c1830... began to be made of iron.”⁸⁹ For this style of printing, which required great pressure, the rolling press was able to “reduce the area over which pressure was applied at a given time”. This was achieved “by laying the inked-up copperplate and paper on a plank and forcing them between two cylinders or rollers. The pressure was applied successively along a line and had to be great enough to force the ink out of the sunken lines onto the paper.”

Intaglio style printing was the slowest process to be mechanised, which is the reason that it presented no challenge to either letterpress or lithographic printing in the nineteenth century. Powered presses were developed for postage stamp printing in the 1890s around the time the half-tone screen began to be used for making photographic intaglio plates. From the beginning, photogravure (also known as rotogravure) was developed for rotary printing. In 1895 Karel Klíč from Vienna took this process to England where it was used by

the Rembrandt Intaglio Company. Around 1910 fast-speed rotary photogravure presses for newspapers and magazines were first used for German newspaper illustrations. After World War I reel-fed photogravure machines came into use.⁹⁰

Iron Press

For commercial purposes, over the nineteenth century, iron presses gradually replaced wooden hand presses for all styles of printing. "Basically, the iron hand press was worked in the same way as its wooden predecessor ... two possible improvements [were] – printing from more than one forme and automatic inking."⁹¹

Jobbing Platen Press

Discussed under Platen Press

Knight's Presses

Discussed under Colour and Printing Presses

Koenig's Cylinder Machines

See Cylinder Press

Lambert Press

Discussed under Colour and Printing Presses

Lithographic Press

"Development of a satisfactory press was one of the more vexing problems that confronted early lithographers."⁹² There was no powered litho machine that was successful in the first half of the nineteenth century, and therefore only 100-120 impressions per hour were possible: not as good as the capability for letterpress. Adaptations of existing platen or rolling presses were tried: many lithographic presses had the pressure applied from either a roller or a platen, but a typical lithographic press had a scraper by which pressure was applied successively along the stone on the flat bed of the press.⁹³ "Numerous kinds of scraper presses were manufactured in the first half of the nineteenth century, from very small ones designed for printing stationery to others that were capable of printing the largest sheets of paper available at the time. Those that achieved the greatest success placed the lithographic stone on a bed, which was then pulled under pressure beneath a scraper. Most lithographic presses of this kind incorporated a tympan to protect the paper from the friction of the scraper; they therefore owed something to both the platen press and the rolling press." Early litho presses were wooden but iron versions were introduced in 1820.⁹⁴

Senefelder's Treatise:

At first Alois Senefelder had used the copperplate rolling press, but experiments to improve it met with difficulties. He constructed a large cylinder press which enabled better impressions to be taken.⁹⁵ Senefelder also experimented with a printing machine in which the inking and damping were done mechanically. In his treatise Senefelder mentioned that the perfection of the lithographic press was not possible until all was made mechanical.⁹⁶ Chapter 6 of Senefelder's treatise is devoted to the subject of lithographic presses, including descriptions and illustrations of the basic types in use, including his own and a press adapted from Mitterer's star-wheel press (cylinder press), an adaptation of the copper-plate rolling press.⁹⁷ After trying all the usual presses, he preferred his own (hand press) which was "essentially the one he refers to in his treatise as the upright-lever or pole press."⁹⁸

Pole Press:

The upright wooden lever press used by Senefelder himself. "With two pressmen it had a reported capacity of one thousand impressions per day."⁹⁹ In 1802, a description was lodged containing "diagrams of Senefelder's pole press, but no description of how it worked."¹⁰⁰

Portable Press:

Ackermann had demonstrated 'the process' [of lithography] before the Committee of Polite Arts in London on a small press, presumably the portable, which Senefelder had sent.¹⁰¹ In his treaty published in 1813 in Bath, H. Bankes included a plate (iv) of a portable machine to take a stone 10 x 15 inches.¹⁰² In Paris, Senefelder perfected a portable press around 1819.¹⁰³

Star-wheel Press:

In 1805 Mitterer invented the star-wheel press. Michael Twyman mentions that Senefelder considered it to have been the only real improvement to his lithographic invention which had not stemmed directly or indirectly from him."¹⁰⁴ Twyman asserts that: "Between about 1820 and 1825, the wooden star-wheel press became established in Germany, France and England as the best kind of lithographic press for quality printing...."¹⁰⁵

Improvements Suggested by Senefelder for Lithographic Printing:

Include printing from cylinders of lithographic stone; mechanical damping and inking.

"After 1830, metal replaced wood on most lithographic presses, but they continued to be manually operated until the middle of the nineteenth century."¹⁰⁶ Twyman states that for lithography, "right up to 1850 the hand press remained.... unrivalled... After 1851 the hand press continued to be manufactured and used for transferring and proofing, and for printing editions of chalk drawings and similar work, but it no longer determined the development of commercial lithography, as it had done during the first half of the century."¹⁰⁷

Sigl's Press

In 1851 in Vienna Sigl built a mechanical press for lithography which worked "on a principle similar to Koëinig's stop-cylinder press."¹⁰⁸ In 1852 Sigl obtained Austrian patents for a powered litho machine with a flat stone and roller that was damped and inked automatically which enabled 800-1000 sheets per hour to be printed. It was first brought to Britain by McLure, McDonald and McGregor when they bought a Sigl press in 1851.¹⁰⁹

Other Lithographic Presses

American Lithographic Press

The standard American lithographic press until 1880s was a flatbed machine that carried the stone. The stone was inked, covered with paper, and the leather tympan was positioned on top. The bed was then raised (by lever or starwheel) to hard contact with a scraper from which the pressure to accomplish the impression was exerted. By cranking the bed which carried the stone across the blade, the impression was created on the paper.¹¹⁰

English Lithographic Presses

McLure, McDonald and McGregor pioneered power litho machines in England when they bought a Sigl press in 1851. It was claimed that their machines were four times as fast as the hand press. (See also above: Sigl's Press.)

Offset Lithographic Press

The offset lithographic press consists of three main cylinders working in unison. The first carries the printing plate (damped and inked by other rollers). The second is clothed in rubber and receives the image from the first. The third is the impression cylinder between which the paper passes to receive the image from the rubber. George Mann obtained a English patent in 1906 for such a press. By 1914, Mann had built many direct and offset rotary machines for lithography. (Direct = direct printing from metal plates.) Web-fed litho machines were developed before World War I, but they were not widely used in the UK until the 1960s when "lithography became fully competitive with letterpress for newspapers and other work that was needed in long runs."¹¹¹

Miehle Press

See Cylinder Press - Two-Revolution Type

Napier Power Platen Press

See Platen Press; Powered Press

Offset Lithographic Press

See Lithographic Press

Orloff Press

Discussed under Colour and Printing Presses

Perfecting Press

See Rotary Press

Platen Press

This group includes the early common press or wooden hand press (also called the joiner's press), and the jobbing platen. In the nineteenth century, it became possible to make such presses from iron. Later in the nineteenth century platen presses were power-operated. Well-known examples of iron platen presses were the *Stanhope*, the *Columbian* and the *Albion*. The type of platen press known as the jobbing platen was developed for the printing of small items. (See below.) The platen press is one that prints from a flat surface as distinct from a cylindrical one. It is best used for relief printing, rather than for intaglio or planographic printing, for both of which greater pressure is needed to obtain good results. It is therefore often referred to as a letterpress machine. The paper is pressed onto a forme of type matter (flat surface), and the pressure from the platen is applied across a broad area as one flat surface is forced against another.¹¹² When the platen is open the forme can be inked by rollers.

A platen machine is not able to print on paper more than about 15 x 20 inches in size. If power operated this type of press can deliver up to 4,500 sheets per hour.¹¹³ Early platen presses were operated by a hand lever (hand presses) or by treadle. "There is some evidence that the hand press was generally abandoned for most bookwork around the middle of the nineteenth century."¹¹⁴ Power driven platen presses were in use "from the early 1830s when the *Hopkinson & Cope* double-platen machine became available."¹¹⁵ The *Napier* power platen press, built a little later, was superior. These two presses, more widely available in the forties, assisted the printing of wood engravings. Power presses became widely used in the later part of the nineteenth century. In the first decade of the twentieth century improvements were made to platen presses to increase "strength of impression and inking power... specially to meet the needs of half-tone and colour printing."¹¹⁶ After World War I, automatic feeders and delivery were developed.

The Iron Platen Press:

Developed in the nineteenth century, iron presses were stronger, and saved both human energy and time:

Stanhope Press:

Invented by the Earle Stanhope around 1800, the first all-iron press was the Stanhope. It increased productivity "by cutting out one of the two pulls necessary to print every page on the common press."¹¹⁷ "Stanhope's press incorporated a system of compound levers, which made it capable of greater pressure than the common press, and it had a platen which

covered the whole forme, whereas the common press had a platen only about half this size and needed two pulls of the press to print a full-size forme."¹¹⁸

Albion Press:

The Albion followed the Stanhope, and was "invented and originally manufactured in London by R.W. Cope in or before 1822."¹¹⁹

Columbian Press:

An American iron press that followed the Stanhope, invented in Philadelphia by George Clymer about 1816.

The Jobbing Platen Press

Early forms were small-scale wooden presses, followed by small-scale iron hand presses.¹²⁰ New versions of platen presses were developed for jobbing printing by the Americans, for example, Gordon and Ruggles, and were introduced in Britain in the 1860s. Others in use included the *Arab*, the *Colt's Armory* and the *Golding*.¹²¹ "The characteristics of the jobbing platen press as it emerged are that the type forme and platen are pressed together by a horizontal rather than a vertical movement; that no moveable carriage is needed and that inking is automatic."¹²²

Platen Presses and Colour Work

Writing in 1882, John Southward gave advice on colour printing using a platen press in his book *Practical Printing*. "Great attention must be paid to the colour when working on a platen machine, as it is more liable to become defective than that of a cylinder machine. A few sheets should be run through the machine, and the ink thoroughly distributed over the rollers, the forme, and the inking table. It will soon be seen whether there is any inequality of colour in portions of the forme, and this must be remedied by altering the screws of the ink ductor. When this is seen to, working off can be proceeded with."¹²³

Pole Press

See Lithographic Press

Powered Press (Printing Machine)

During the nineteenth century power to drive the printing press was applied first from a steam-engine, then from the internal combustion engine, and later from the electric motor.¹²⁴ Powered presses have a complicated history. In 1810 steam was first applied to a platen press, then to a cylinder press, and later, in 1851, to a lithographic press. At the end of the nineteenth century, steam power was applied to intaglio presses. Rotary machines appeared in the 1860s when "William Bullock (1813-67) in the USA and John Walter III (1818-94) in the UK introduced horizontal reel-fed rotary machines." An offset machine that relied

upon the rotary printing principle for lithographic printing on paper “was first proposed in 1903 by the American Ira W. Rubel.”¹²⁵

Proofing Press

Press used for taking proof impressions.¹²⁶

Roller

The composition coated cylinder used for evenly inking the forme or plate before printing.¹²⁷

Rolling Press

Also known as the copper-plate press. “The rolling press was used for hand-printing from intaglio plates and was designed to apply extremely heavy pressure required in such work, the roller applying great pressure to successive points on the flat bed. The earliest rolling presses were made of wood. A bed was held between the posts, or checks, and heavy rollers fixed between them above and beneath the bed. An X-shaped handle was attached to the outer side of the check and to the bed. The plate was placed face upwards on the bed and after it had been inked the paper laid on it. The handle was then turned so that the bed passed between the rollers and the paper was pressed down into the inked plate thus making the impression. The wooden rolling press was apparently a Dutch invention of the late sixteenth century; it came into use throughout Europe during the next 50 years.” Later improvements were along the lines of those for letterpress machines, with iron presses being introduced in the 1830s. “They were essentially of the same design, although the machinery of the rollers and the screw mechanism of the handle were more precise in operation.”¹²⁸ In the twentieth century, Stanley Hayter observed that “the design of the roller press used for printing from intaglio plates has not changed essentially since the seventeenth century.”¹²⁹

Etching Press

“Pressure on a printing press is variable and less is used to print an etching than to print an engraving.”¹³⁰

See also Intaglio Press

Rotary Press

A machine in which the printing plate surface is cylindrical as opposed to the flat bed of a cylinder press. A rotary press may be either sheet-fed or web-fed.¹³¹ The rotary press derives from the intaglio rolling press. “Rotary printing, in which the material to be printed is fed between revolving cylinders, one of which carries the printing surface, derives not from relief-printing techniques but from the intaglio process, in which engraved copper plates are printed from a rolling press.”¹³² Textile printers of the late eighteenth century printed from cylinders instead of flat plates. In 1764, Thomas Fryer and John Newberry patented a

machine for colour printing on cloth “by means of engraved copper cylinders on which colours are laid by smaller cylinders which are put in motion by other plain cylinders.”¹³³

During the next century, improvements were made and other cylinder presses for the printing of textiles developed, but “in this period there were many experiments, and it is difficult to apportion credit to the various claimants to the title of ‘inventor’ of the rotary printing press.”¹³⁴ The thrust of the nineteenth century improvements were to enable greater efficiency. “The most efficient machines would be those which could print on both sides of a moving web of paper at one pass through the press.”¹³⁵ Even in the nineties, “rotary machines were not much used for printing process blocks ... although a machine for printing photogravures was exhibited at the Printing Trades Exhibition in 1880, they were not really satisfactory. Storey’s of Lancaster were using rotary machines for their secret method of screened rotogravure by 1895, but this method was not much used in bookwork before the end of the century.”¹³⁶ The rotary press was developed and improved for offset lithography and direct printing (that is, direct from metal plates) by World War I.

Walter Press:

In 1866 Walter built a prototype reel-fed rotary machine. By 1869, these presses were employed in London. “The Walter press marked a turning point in the evolution of fast-running letterpress machines, and also pointed the way for the later development of lithographic and gravure printing.”¹³⁷

Hoe Press:

“In 1846 Richard Hoe patented a rotary sheet press in New York.”¹³⁸ This advance was made possible by the improvement of stereotyping, so that curved plates could be produced, and also by the employment of reel fed paper, “successfully demonstrated by William Bullock in 1865.”¹³⁹ Thus 1865, the year that rotary printing from curved plates had been perfected, saw an important step forward for printing.¹⁴⁰ Hoe machines eventually ousted Walter machines at the *Times* in the eighteen nineties: they were “capable of printing, cutting, and folding 24,000 copies of a complete newspaper in an hour.”¹⁴¹

Sheet-fed Rotary:

Prints 4000-6000 sheets per hour, one at a time, and can print different sizes.

Web-fed Rotary:

Prints paper direct from the roll. The paper is cut and folded later. Delivers 10,000 to 20,000 copies per hour, and is used for magazine and newspaper printing. It is only economical to use this type of press for runs of more than 20,000 copies per hour. (Compare with 200 one-sided sheets per hour for nineteenth century letterpress printing.)

Perfecting Machines:

A four cylinder perfecting press is a rotary machine that can print two sides of a sheet in one operation and was developed in the 1870s by Eickhoff.¹⁴²

See also Rolling Press; Powered Press

Rubber Press

See Lithographic Press

Scraper Press

See Lithographic Press

Sheet-fed Rotary Press

See Rotary Press

Sigl Press

See Lithographic Press

Stanhope Press

See Hand Press; Platen Press

Star-wheel Press

See Lithographic Press

Steam Powered Presses

See Powered Press

Two-Colour Machines

Discussed under Colour and Printing Presses

Two-Cylinder Machines

These machines were introduced for colour printing in America in Massachusetts by Huber and Hodgman in the 1880s.

See also Cylinder Press.

Two Revolution Press

See Cylinder Press.

Web-fed Rotary Press

See Powered Press; Rotary Press

Wharfedale Press

See Cylinder Press

Wooden Press

See Hand Press; Platen Press

- ¹ Harold Curwen, *Processes of Graphic Reproduction in Printing*, 3rd ed. rev. and enl., rev. by Charles Mayo (London: Faber, 1963), 35.
- ² Geoffrey Wakeman, *Victorian Book Illustration: The Technical Revolution* (Newton Abbot: David & Charles, [1973], 104.
- ³ *Ibid.*, 99.
- ⁴ R.M. Burch, *Colour Printing and Colour Printers* (London: I. Pitman, 1910), 14.
- ⁵ Bamber Gascoigne, *How to Identify Prints: A Complete Guide to Manual and Mechanical Processes From Woodcut to Ink Jet* (London: Thames and Hudson, 1986), 28b.
- ⁶ Burch, *Colour Printing and Colour Printers*, 126.
- ⁷ John Feather, *A Dictionary of Book History* (London: Croom Helm, c1986), 21.
- ⁸ C.T. Courtney Lewis, *George Baxter (Colour Printer): His Life and Work: A Manual for Collectors* (London: 1908), 86.
- ⁹ Peter Croy, *Graphic Design and Reproduction Techniques*, 2nd ed. rev. (London: Focal Press, 1972), 64.
- ¹⁰ Wakeman, *Victorian Book Illustration*, 113.
- ¹¹ *Ibid.*, 114-115.
- ¹² Antony Griffiths, *Prints and Printmaking: An Introduction to the History and Techniques* (Berkeley and Los Angeles: University of California Press, c1996), 113.
- ¹³ James Moran, *Printing Presses: History and Development from the Fifteenth Century to Modern Times* (London: Faber, 1973), 162-164.
- ¹⁴ Gascoigne, *How to Identify Prints*, 48a.
- ¹⁵ C. Koeman, 'The Application of Photography to Map Printing and the Transition to Offset Lithography', chap. 6 in David Woodward, *Five Centuries of Map Printing* (Chicago: University of Chicago Press, 1975), 147.
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- ⁶³ Gascoigne, *How to Identify Prints*, 107.
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- ⁹³ See Michael Twyman, *Printing 1770-1970*, 57.
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- ⁹⁶ *Ibid.*, 106.
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- ⁹⁸ *Ibid.*, 68.
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- ¹⁰⁴ *Ibid.*, 20.
- ¹⁰⁵ Twyman, 'The Lithographic Hand-press 1796-1850', in *Journal of the Printing Historical Society*, 3 (1967): 22. This article, one of the most authoritative on lithographic presses, includes illustrations of early presses.
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