Curious Architecture.

felines, stairs and human affairs: what *is* Architecture made of?

A thesis submitted to the School of Architecture and Design, Victoria University of Wellington,
in fulfilment of the requirements for the degree of Master's of Architecture (Professional).
September 2011

Jaq Penwell

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Abstract

The presence and reconciliation of the poetic with the pragmatic is deemed essential if any constructed endeavour in our built environment is to be termed architecture. This thesis argues that if architecture is that which offers us the ability to inhabit space and create *place* via the deliberate instigation of spatial, sensory, physical, emotional, spiritual and intellectual experience that engages us, communicates meaning and supports our lives beneficially, then architects do not currently and have not considered the stair historically, to be architecture. This thesis posits that historically and contemporaneously architects have treated and continue to treat the stair as either a pragmatic but tiresome necessity to be afforded as little attention as possible or as a kind of object-plaything that if it must be present, should be exploited for its visual qualities and symbolic connotations, no matter how fanciful or how meaningless the results. This thesis argues that as a result of these paradoxical but equally superficial treatments, and the length of time over which we have subjected the stair to them, its nature is now so indeterminate that not only do we as architects not question this treatment, we no longer even notice it. It is argued that the consequences of this indifference are the loss of opportunity to identify and examine the potential of the stair to offer us architectural, in the sense of *inhabitory*, experience of worth and meaning. The aim of this thesis therefore is to demonstrate that the stair, when examined from the perspective of *place*, rather than just space, offers many possibilities with regard to meaningful inhabitation. This is achieved through the use of two methods. A historical investigation and analysis is first conducted to trace, document and explain the development and use of the stair, to understand the causes for our superficial treatment of it, the stair's consequent indeterminate existence at the present time, and our apparent indifference to this. The knowledge gained is used to inform the second method of investigation, that of devising and conducting a series of design experiments aimed at apprehending the stair from the position of architecture as inhabitable *place*. The experiments demonstrate an alternative approach to consideration of the stair that reveal its unrealised potential to contribute to meaningful architectural, *inhabitory*, experience, and so enrich our day to day lives.

TABLE OF CONTENTS

ABSTRACT

List of Illustrations

I INTRODUCTION: An Unusual Proposition

i	Curiouser and Curiouser	2
ii	May I have Your Attention Please?	4
iii	Incuriouser and Incuriouser	5
iv	The Evidence for Indeterminacy: Publishing a Paradox	5
v	The Outsider	6
vi	But Why Would The Stair <i>Not</i> be Architecture?	6
vi.i	An Inconvenient Truth	6
vi.ii	Ornamental or Essential?	7
vi.iii	Inhabiting Space and Creating Place - A Diagonal Dilemma	8
vi.iv	Awkward Spaces Become non-places?	9
vii	Back to the Future - The Medieval Modern	10
viii	A Perpetual Problem - Schrödinger's Stair?	11
ix	Paradoxical Parameters: The Pleasure and Problems of Curiosity	11
x	Where Am I?	11
xi	You Are Here - Mapping a Path	12

ii

i

iv

PART 1: A HISTORICAL INVESTIGATION

1.1	Clearly Curious	16
1.1.1	<i>A Plethora of Paradoxes</i>	16
1.1.2	<i>(In)between: A Shock and a Hard Place</i>	18
1.1.3	<i>A Primary Purpose</i>	19
1.1.4	<i>On The Move? Firmitas and Fixity: Strange Expectations</i>	19
1.1.5	<i>A Geometer's Dream</i>	21
1.1.6	<i>Taking a Walk - A Sensory Tour</i>	23
1.1.7	<i>No News is Good News Or Is It?</i>	24
1.1.8	<i>Dangerous Spaces - Terrible Tales and High Crimes</i>	26
1.1.9	<i>Building Barriers: An Architecture of Kryptonite?</i>	29
1.1.10	<i>Folly, Flight and Falling Felines: Uneasy Heights</i>	31
1.1.11	<i>Flights of Fancy: Imagineering God(s)</i>	37
1.1.12	<i>Would You Like Size With That?</i>	42
1.1.13	<i>Back Down to Earth Spatial Relations(hips)</i>	44
1.1.14	<i>Artistic Licence and Mathematical Mayhem: Infinitely Curious</i>	46
1.1.15	<i>Cumulatively Curious</i>	47
1.2	In the Beginning Technology, Gods and a Troublesome Triad	47
1.2.1	<i>Incurious Origins – The Logical Ladder</i>	47
1.2.2	<i>Monumental Mesopotamia</i>	48
1.2.3	<i>Firmness, Commodity and More Commodity? Vitruvian Values – A Curious Contradiction</i>	49
1.2.4	<i>Technical Tricks: Gothic Mastery and Dizzy Heights</i>	50
1.2.5	<i>Helical Journeys - On Leonardo, Lookouts and Lions</i>	54
1.2.6	<i>Mannerist Mischief: Michelangelo and the Laurentian Stair</i>	56
1.2.7	<i>Alberti's Stair: A Disturbing Affair</i>	59

1.3	Renaissance Revelations: In, Out and Baroque it all About	60	PART 2 RESEARCH BY DESIGN: Experimental Inhabitation:	113
1.3.1	<i>A Walk in the Park: The Garden Stair</i>	60	2.1 <i>The Research Proposition</i>	115
1.3.2	<i>Palladio's Approach: An Exterior Entrance</i>	63	2.2 <i>Devising a Process</i>	115
1.3.3	<i>Unpardonable Errors and Interior Issues</i>	65	2.3 <i>The Process Outline</i>	119
1.3.4	<i>A Magnificent Change Is As Good As The Best?</i>	67	2.4 <i>The Process: Step by Step</i>	119
1.3.5	<i>The Piano Nobile: A Processional Prompt and A Curious Question</i>	68	2.5 <i>Findings</i>	162
1.3.6	<i>Extravagant Interior? Fantastical Theatre! To Infinity and Beyond</i>	70	2.6 <i>Discussion and Future Research</i>	163
1.3.7	<i>Splendid Isolation – A Curious Conundrum</i>	71	2.8 CONCLUSION: felines, stairs and human affairs	168
1.3.8	<i>Excessively Curious Curiously Excessive</i>	72		
1.4	Modern Matters	74	References	172
1.4.1	<i>A Final Fling: Revelling In The Rococo – A Parisian Affair</i>	74	Image Credits	182
1.4.2	<i>Curious Hybrids</i>	76		
1.4.3	<i>Constructing Craft and Documenting Details</i>	77	Appendix: 1 Research by Design: Experiments Series 2	187
1.4.4	<i>Scientific Curiosity: An Ergonomic Advance</i>	78	Appendix: 2 Research by Design: Experiments Series 3	215
1.4.5	<i>Anomalies, Anachronisms, Anarchy and Asymmetry: Viollet-Le-Duc</i>	80	Appendix 3: Research by Design: Paper Models	239
1.4.6	<i>Material Concerns</i>	80		
1.4.7	<i>Going Up? The Elevator and the Upward City</i>	87		
1.4.8	<i>Aberrant Architecture: A Peculiar Process</i>	91		
1.4.9	<i>Vertical Volume versus The Horizontal Plane</i>	93		
1.4.10	<i>Regulation Rules: Mortification, Malcontent, and The Death of Delight</i>	98		
1.4.11	<i>Experimental Inhabitation: A Stair is a Stair is a ?</i>	100		
1.5	Completely Curious – Be(A)ware of the Stair	105		

LIST OF ILLUSTRATIONS

Figure 1:	A bicycle shed; pragmatic building?	3	Figure 28:	Stairway of terror	35
Figure 2:	Lincoln Cathedral; UK., poetic architecture?	3	Figure 29:	The great ziggurat at Ur	37
Figure 3:	A bicycle shed, designed with aesthetic intent	3	Figure 30:	China Central Television headquarters, Beijing	37
Figure 4:	Simple stair at the Roman settlement of Beleida	5	Figure 31:	The Tower of Babel by Pieter Bruegel the Elder (1525 – 1569)	40
Figure 5:	Reception of Le Grand Conde at Versailles by Louis XIV (1878) by Jean Leon Gerome	5	Figure 32:	The great stairways of the Apadana Palace, Persepolis	40
Figure 6:	The grand staircase of the Paris Opera (1875) by Charles Garnier (1825-1898)	5	Figure 33:	The upper chapel of Sainte-Chapelle, France	41
Figure 7:	Stair in private residence	5	Figure 34:	The Burj Khalifa Hotel	42
Figure 8:	Contemporary fire escape	5	Figure 35:	A lookout	43
Figure 9:	Non-place	9	Figure 36:	A bed	43
Figure 10:	The Spanish steps, Rome	9	Figure 37:	A seat or a lounge	43
Figure 11:	Medieval spiral stair	10	Figure 38:	A couch	43
Figure 12:	Contemporary fire escape stairwell	10	Figure 39:	Villa Skywa Primavesi, Vienna, 1913-15, by Josef Hoffman	45
Figure 13:	Bespoke staircase for private residence	10	Figure 40:	Villa Scheu, Vienna, Austria, 1912-1913, by Adolf Loos	45
Figure 14:	Ruined stair in Madame Sherri forest, Chesterfield.	21	Figure 41:	Carceri, plate VII, the drawbridge, Giovanni Battista Piranesi (1720-1778)	46
Figure 15:	Scene from the 2004 movie Lemony Snicket's A Series of Unfortunate Events	21	Figure 42:	House of stairs, lithograph, 1951, by M. C. Escher (1898-1972)	46
Figure 16:	A is for Amy and architectural awfulness	26	Figure 43:	Stairs, mixed media, 2001, by Rachel Whiteread (b.1963)	46
Figure 17:	Design fail	29	Figure 44:	City of Yawnghe in the Inle Lake, Heho, Burma	47
Figure 18:	A stair lift	30	Figure 45:	The great ziggurat at Ur	49
Figure 19:	The ibot stairclimber	30	Figure 46:	View of Strasbourg, France, c.1490, woodcut from the folio of Hartmann Schedel	51
Figure 20:	The Martin Jetpack	30	Figure 47:	Chartres Cathedral, Paris, France	51
Figure 21:	Da Vinci's Wings	31	Figure 48:	Chartres west tower helical stair	52
Figure 22:	Israel Ludlow and his Ludlow Aeroplane	31	Figure 49:	Chartres cathedral plan	52
Figure 23:	Tigers love to climb	32	Figure 50:	Tower from the portfolio of Villard-de-Honnecourt.	54
Figure 24:	Free-fall	32	Figure 51:	Section documenting flying buttress	54
Figure 25:	Skateboard fail	32	Figure 52:	The lion and the porcupine	54
Figure 26:	Two limbs good four limbs better	33	Figure 53:	The stair at Blois, (1515-1525) for King Francis I	55
Figure 27:	When stairs become a playground	33	Figure 54:	The marvellous double helix stair at Chambord for King Francis I	55

Figure 55: The plan of the Ricetto for the Laurentian library	57	Figure 82: Stage set featuring grand stair by Giuseppe Galli Bibiena	70
Figure 56: The Ricetto - an entrance with no room for an entrance	57	Figure 83: The Scalone Palazzo Madama Torina, Turin, Italy, by Filippo Juvarra.	71
Figure 57: Classical conformity gives way to chaos	58	Figure 84: The royal staircase of the Reggia di Caserta, 1752-1780. By Luigi Vanvitelli (1700-1773)	79
Figure 58: Chaos from on high	58	Figure 85: Grand stair of the Pallazo Farnese, Caprarole, ca 1584, by Giacomo Barozzi da Vignola	72
Figure 59: Varying vagaries	58	Figure 86: Pallazo Farnese, the open newel of the grand stair	72
Figure 60: The Laurentian library	59	Figure 87: Pallazo Farnese, the elaborate ceiling of the stair	72
Figure 61: Europe's first botanic garden, Padua, Italy, 1545	61	Figure 88: Palace of Versailles, the Salon des Porcelaines	75
Figure 62: The garden of the Chateaux Vaux-le-Vicomte, 1657-1661, by Andre le Notre	61	Figure 89: The Grand Stair at the Bishops Palace in Wurzburg by Balthasar Neumann	75
Figure 63: Dragon fountain and stair, Villa d'Este, Italy	62	Figure 90: The Grand Stair at the Bishops Palace	75
Figure 64: Grand Stair, Villa Garzoni	62	Figure 91: Staircase of the Balbi Family's Palace at No. 5, Via Balbi, Genoa, Italy	76
Figure 65: View from the head of the stairs at the organ terrace, Villa d'Este, Italy	62	Figure 92: The Crystal Palace at Hyde Park, 1851	84
Figure 66: Grand Stair, Villa Farnese, Caprarola	62	Figure 93: The Crystal Palace interior	84
Figure 67: The Grand Stair, Villa d'Este, Italy	62	Figure 94: The Crystal Palace interior, including stair	84
Figure 68: Palladio's oval stair for the monastery of Santa Maria della Carita, 1561	64	Figure 95: Crystal Palace, stair detail	84
Figure 69: The stair at Carita from above.	64	Figure 96: Ironwork balusters by William Kinman, to a design by Robert Adam, 1774	85
Figure 70: Villa Godi, 1537-1542, Andrea Palladio	65	Figure 97: John Soane Museum, London, iron balustrade on the staircase, 1808-09	85
Figure 71: Villa Chiericati, 1550s, Andrea Palladio	65	Figure 98: St. Pancras Renaissance London hotel: grand staircase.	86
Figure 72: Villa Cornaro, 1552, Andrea Palladio	65	Figure 99: St. Pancras Renaissance London hotel: grand staircase.	86
Figure 73: Villa Capra (La Rotonda), Ca. 1560s, Andrea Palladio	65	Figure 100: Edoux hydraulic lift 1888.	87
Figure 74: Plan, Villa Capra (La Rotonda)	66	Figure 101: Amiotts stair climber, for serene ascent, 1889	87
Figure 75: Plan, Villa Chiericati	66	Figure 102: The Lascale fire escape, a rope-type fire escape, disguised as a washstand, 1878	89
Figure 76: Figure x: Plan, Villa Cornaro	66	Figure 103: Oppenheimer fire escape, parachute and overshoes, 1879	89
Figure 77: The Ca'd'Oro (the Palazzo Santa Sofia), 1428-1430	68	Figure 104: Villa Muller, 1928	95
Figure 78: The ceiling of the Church of Sant 'Ignazio, Rome, 1691-94, by Andrea Pozzo	69	Figure 105: Villa Muller interior	96
Figure 79: Painted dome, the Church of Sant 'Ignazio, Rome, 1685, by Andrea Pozzo	69	Figure 106: Villa Muller interior	96
Figure 80: Reggia di Portici, Naples, Italy., Frescoes, 1750, by Vincenzo Re	69	Figure 107: Plan, Villa Muller	97
Figure 81: Italian palace portico with stair and fountain, by Giuseppe Galli	70	Figure 108: Plan, Villa Muller	97

LIST OF ILLUSTRATIONS Cont.

Figure 109: Plan, Villa Muller	97
Figure 110: Plan, Villa Muller	97
Figure 111: Final wooden house 1	101
Figure 112: Final wooden house 2	101
Figure 113: Final wooden house 3	101
Figure 114: Final wooden house 4	101
Figure 115: Final wooden house 5	101
Figure 116: Final wooden house 6	101
Figure 117: Final wooden house 7	101
Figure 118: Final wooden house 8	101
Figure 119: Final wooden house 9	101
Figure 120: Final wooden house 10	101
Figure 121: House H, Tokyo, Japan, 2009, by Sou Fujimoto Architects	102
Figure 122: House H by Sou Fujimoto	102
Figure 123: House tower, Tokyo, Japan, 2006, by Bow Wow Architects	102
Figure 124: House tower, bathroom	102
Figure 125: Tattoo house, Melbourne, Australia, 2008, by Andrew Maynard.	102
Figure 126: Eva's bed by H2O architects.	103
Figure 127: J-loft, Singapore, 2008, by Plystudio	103
Figure 128: Plus-Nyan house by Asahi Kasei Homes, Tokyo, Japan, 2008	103
Figure 129: Plus-Nyan house, corner stair to the catwa	103
Figure 130: East village studio, New York City, Jordan Parnass Digital Architecture.	104

ACKNOWLEDGEMENTS

This thesis is the culmination of five and a half years of study at Victoria, throughout which I have been supported by a great many people, to whom I owe a large debt of gratitude. A truly heartfelt thank you to all of the following;

Susan Barrington, Sharon Renfro, Dr John Gregson, Dr Paula King, Jo Hodge, Steve Perrin, Maria Goncalves-Rorke, Lorraine Guthrie, Jon Everton and all the lovely staff at Student Services for caring for me and supporting me with unfailing kindness; without their unflagging support I would not have been able to complete my studies

Dr. Christine McCarthy, for everything

Professor George Baird, Nigel Isaacs, John Gray, Sam Curtis, Guy Marriage, Dr. Mike Donn, Philippe Campays, Paul James, Christina MacKay, Jacqueline McIntosh, Professor John Storey, Morten Gjerde, Simon Twose, Russell Walden, Alex Hills, Maibritt Pederson-Zari, Hayden French, Arindam Sen, Professor Andrew Charleson, Tobias Danielmeier, Michael Dudding, Mark Southcomb, Daniele Abreu e Lima, Dr Geoff Thomas and Dr. Robin Skinner for both generosity in sharing hard won knowledge and for kind words and encouragement

Angela Foster, Professor Kerstin Thompson, Professor Peggy Deamer, Professor Andrew Barrie, Dr. Peter Wood, and Dr. Jan Smitheram for invaluable critique

Sandra France, Jenny Christie, Professor Diane Brand, Sarah Richardson, Sou Chea, Hilary Reid, Tanya Carter and Nigel Guy for kind support

Our great technical and IT staff, especially David Carleton, Frances Matheson, Arthur Mahon, Kevin Cook, Peter Ramutenas, Stewart Milne and Eric Camplin for ever patient and friendly help

All our amazing library staff, especially Elizabeth Russell, Julie Baga, Chrissy Tetley and the late and sadly missed John Muir; thank you all for your incredible patience with my tardy returns (and for waving my fines), your kindness, support, help and encouragement over the last five and a half years; for all the friendly smiles, warm greetings and consoling words, for providing comfort and sanctuary in difficult times, and for your shared delight in a love of learning and knowledge. Especially grateful thanks to Julie Middleton and Sue Smith for all the above and for exceptional kindness, friendship and support when the going got particularly tough

My parents, John and Marion, my brother James and my incredibly tolerant and supportive partner Marty, for more reasons than I can say. Marty - ILUSTW [refrigerator]

Micah Rickards, Delle Benton, Kellie Kernohan, Robin Aitkin, Andrew Raynes, Lee Kimber and Hilde Ivesdal, for constant friendship, laughter, sympathy, rescue, moral support, peer review, proof reading, and ever available shoulders. Micah – a special thank you for rescuing me from my printing debacle – you were amazing!

Trudie Pilkington, Sally Llewellyn, Jonathan Sim, Hamish Braddick and Chris McDonald, Megan and Stuart Woodbridge for always cheering me on, especially at the final stages

Thank you all.

INTRODUCTION: An Unusual Proposition

I. INTRODUCTION: An Unusual Proposition.

i. Curiouser and Curiouser

To make a complete stair-case is a curious piece of Architecture. Sir Henry Wotton. (1624). *The elements of architecture*. p57¹.

Curious; interesting for being inexplicable, strange, odd².

Stairway: A Series of steps or stairs with or without landings, including all necessary handrails and giving access between two different levels³.

If curiosity did indeed kill the cat, then it would seem that according to Sir Henry Wotton (1568–1639), English Ambassador to Venice during the period 1604-1624, a sensible architect, wishing to avoid a similar fate, might do well to avoid dealing with such an uncomfortable entity as a staircase wherever possible⁴. Wotton's observation, at once cautionary and intriguing, hints that the successful architecting of a staircase is a task of such elegant complexity and peculiar difficulty that only the most clever and skilful, cunning even, could succeed at it. Indeed, if Wotton is to be believed, the process would appear to be comparable to the experience of tiger wrangling; fantastic, beautiful and complex, yet at the same time unruly, wild, and likely to possess unfortunate consequences in the event of careless handling.

This intriguing observation, at once warning and prophecy, observation and instruction (that a staircase *should* be curious if it is to be Architecture), invitation and restraint; is so far at odds from the disinterestedly bland definition of the New Zealand Building Code (and such codes in general) that it seems doubtful they might refer to the same entity⁵. According to the building code (above), the stair's purpose is unequivocal - vertical access – and the need for certain explicit functional requirements to safely ensure this – such as handrails – is noted⁶. An uncomplicated matter then and no cause for hesitation it would seem.

The stair of the building code, unlike the staircase of Wotton's acquaintance, contains no hint that complexity or trickery lies in wait, there appear to be no pitfalls for the unwary or inexperienced, there is nothing in fact, to suggest the degree of caprice, elusiveness or duplicity such as Wotton's caution might imply.

If Wotton is also to be believed however and the stair *is* a curious creature, then this disparity in interpretations, and the extent of it, is even curiouser. How can such a construction, so apparently straightforward, such that the implication is it is prosaic in its ubiquity and predictability on the one hand, warrant such a warning, pose such a problem, as his observation implies on the other? Wotton's particular statement will be examined further for other clues as to why this dichotomy might be so, but this paradox, this duality of nature, reflects a tendency of humans to eventually invest the objects that we construct to fulfil our pragmatic needs with a meaning beyond their functionality⁷. This meaning, expressed through materiality, colour, careful craft and beauty, may transform, extend or multiply the functions and significance of the most humble and apparently base of objects far beyond the purpose that originated them⁸. Architecture, according to the Western classical tradition at any rate, is the highest expression of this tendency⁹. Shelter is one of humanity's most ancient and fundamental needs, and it may be readily achieved by the building of basic, purely functional structures¹⁰. Architecture as an endeavour however evolved from building not just to reflect this human tendency to express the poetic, but to demand it, if the end results are to be worthy of the title 'Architecture' also¹¹. And whilst other arts may demand the poetic also, architecture has tended to be regarded (both historically and contemporaneously, by its practitioners at least), as the art for which it is most imperative¹².

⁷ Brolin, B. C. (1985). *Flight of fancy: the banishment and return of ornament*. p14. Cook, P. (1967). *Architecture: action and plan*. pp9, 10. de Botton, A. (2006). *The architecture of happiness*. p212.

⁸ Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p1. Clark, K. (1971). *Civilisation*. p3. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp12-13. Harries, K. (2000). *The ethical function of architecture*. p20. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. pp2, 38. Brolin, B. C. (1985). *Flight of fancy: the banishment and return of ornament*. pp1-2.

⁹ Kostof, S. (1995). *A history of architecture: settings and rituals*. p12. Goldberger, P. (2009). *Why architecture matters*. p26. Cook, P. (1967). *Architecture: action and plan*. p10. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p9.

¹⁰ Maslow, A. H. (1962). *Toward a psychology of being*. pp216, 413. Oliver, P. (1997). *Encyclopaedia of vernacular architecture of the world*. pp347, 421. Allen, E. (2005). *How buildings work: the natural order of architecture*. p23. Allsop, B. (1974). *Towards a humane architecture*. pp8, 78. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p3. Quantrill, M. (1974). *Ritual and response in architecture*. p102. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p71. Harries, K. (2000). *The ethical function of architecture*. p141. Oliver, P. (1987). *Dwellings: the house across the world*. p104. Hagan, S. (2001). *Taking shape: a new contract between architecture and nature*. p11.

¹¹ Goldberger, P. (2009). *Why architecture matters*. pp6-7, 8, 42. Wigginton, M. (1996). *Glass in architecture*. p10. Till, J. (2009). *Architecture depends*. p182. Harries, K. (2000). *The ethical function of architecture*. pp12, 119. Pevsner, N. (2009). *An outline of European Architecture*. pxxx.

¹² Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p11. Quantrill, M. (1974). *Ritual and response in architecture*. p102. Goldberger, P. (2009). *Why*

¹ See also, Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p14.

² 'curious' (2011). *Shorter Oxford English dictionary, Sixth Edition*. p584.

³ Department of Building and Housing. (2005). *Clause D1 - Access routes*. p14. Braun, M. (2008). *Stairs: architectural details*. p8.

⁴ Wotton, H. (1968). *The elements of architecture*. p57. Wotton served as ambassador to Venice at this time except during the periods 1612-1616 and 1619-1621 where ambassadorial duties required his presence at the Hague and Vienna. Smith, L. P. (1907). *The life and letters of Sir Henry Wotton*. pp46, 144.

⁵ 'Stairway' (2012). *International building code 2012 edition*. (online).

⁶ Department of Building and Housing. (2005). *Clause D1 - Access routes*. p14.

The subsequent struggle to reconcile this self-imposed requirement for the poetic with the harsh realities of the pragmatic in the creation of our built environment has imbued every aspect of it with this duality, such that each construction element that contributes to the entirety of a building, even when only built to fulfil minimum needs, has become invested with a vastness of intangible meanings and physical expressions, to become complex, poetic entities – architecture – in their own right¹³. Frequently, the factor that determines whether we experience the complexity and richness of an intentionally architectural experience as opposed to the simplistic baseness of a building intended to fulfil bare functionality only, is money¹⁴. Construction is an expensive affair, owing to the scale at which it occurs and the frequent need or (traditional) desire for the custom made, thus economic constraints may dictate that a building, rather than architecture, becomes the intent¹⁵. In such a building, the materials used may be of poorer quality, ornamentation may be removed; space is quantifiable and costly, dimensions are frequently shrunk and proportions constrained, spatial relationships may be restricted and forms curtailed¹⁶. The architectural elements that comprise this building (the walls, roof, floors, the doors and windows, the stairs) will correspondingly be degraded also until the building is no longer architectural in the poetic sense but is reduced to a base, physical character that exists purely to fulfil a pragmatic function (and ensure maximum cost effectiveness) rather than provide sensory pleasure¹⁷.

Buildings, and so the elements which comprise them, are a particularly intriguing demonstration of this paradoxical dual personal therefore. They are unique; the frequency, intimacy, scale and intensity with which we encounter buildings ensures that they pervade our experience; they impact upon and influence our lives in a way and to an extent that few other objects or entities we create do, and for the most part, in a manner that we have little choice over¹⁸. Architecture then is a *social art*¹⁹.

Figure 1: A bicycle shed; pragmatic building?

Figure 2: Lincoln Cathedral; UK., poetic architecture?

According to the historian Sir Nikolas Pevsner, a bicycle shed is *not* architecture but Lincoln Cathedral *is*, because it was created with aesthetic intent in mind¹¹. Which leads to the question

what does that make this ?

and what are the implications of such a definition for the stair?

Figure 3: A bicycle shed, designed with aesthetic intent

architecture matters. p39.
¹³ Oliver, P. (1997). *Encyclopaedia of vernacular architecture of the world*. p347. Oliver, P. (1987). *Dwellings: the house across the world*. pp57, 173. Goldberger, P. (2009). *Why architecture matters*. pxiv. Wigginton, M. (1996). *Glass in architecture*. p10. olamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p71. Harries, K. (2000). *The ethical function of architecture*. pp23-25. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. p66. Kennedy, J. M. (2008). *Metaphor and Art*. pp28, 34-35. In Gibbs, R. W. Jr. [Ed.] *The Cambridge handbook of metaphor and thought*. (pp456).
¹⁴ Allsopp, B. (1974). *Towards a humane architecture*. pp13, 21-23, 94-95, 98. Kostof, S. (1995). *A history of architecture: settings and rituals*. p13. Losantos, A. (2006) *Stair design*. p4. Allen, E. (2005). *How buildings work: the natural order of architecture*. p10. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p26. Allen, E. (2005). *How buildings work: the natural order of architecture*. pp237-238. Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. pp69, 129-130. Quantrill, M. (1974). *Ritual and response in architecture*. p110. de Botton, A. (2006) *The architecture of happiness*. p18. Till, J. (2009). *Architecture depends*. p45. Harries, K. (2000). *The ethical function of architecture*. p29.
¹⁵ Allen, E. (2005). *How buildings work: the natural order of architecture*. p161, 237-238. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. p126. Quantrill, M. (1974). *Ritual and response in architecture*. p110. Fisher, T. R. (2000). In the scheme of things: alternative thinking on the practice of architecture. pp27-28, 44. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p142.
¹⁶ Goldberger, P. (2009). *Why architecture matters*. p133. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. p88. Harries, K. (2000). *The ethical function of architecture*. p144.
¹⁷ Allsopp, B. (1974). *Towards a humane architecture*. pp13, 21-23. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp48-50. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p37. Harries, K. (2000). *The ethical function of architecture*. p24.

¹⁸ Ponti, G. (1960). *In praise of architecture*. pp14-15. Goldberger, P. (2009). *Why architecture matters*. ppxi-xii, 6-8, 15-16, 172. Hillier, B. (2007). *Space is the machine*. p68. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp152-153, 238. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp118-120, 127. Quantrill, M. (1974). *Ritual and response in architecture*. p95. Exner, U. and Pressel, D. (2009). *Spatial Design*. p9, 38. Till, J. (2009). *Architecture depends*. p50.
¹⁹ Clark, K. (1971). *Civilisation*. pp247, 330. Kostof, S. (1995). *A history of architecture: settings and rituals*. p7. Quantrill, M. (1974). *Ritual and response in architecture*. p12 Cook, P. (1967) *Architecture: action and plan* p31. Allsop, B. (1974). *Towards a humane architecture*. p58. Till, J. (2009). *Architecture depends*. pp125-126, 182. Harries, K. (2000). *The ethical function of architecture*. pp13, 149. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. pp1, 3, 6. Imrie, R. and Street, E. (2011). *Architectural design and regulation*. p8.

ii. May I Have Your Attention Please?

May I have your attention please? Will the real staircase please stand up? I repeat, will the real staircase please stand up

If, of all our endeavours, buildings might appear to be an exceptionally evident and emphatic demonstration of this conjoint persona and paradoxical nature, it might also appear (on a preliminary survey of the available literature) that stairs have evolved as particularly extreme exemplars in building²⁰. Since the stair's origins as a structural device and technological solution to enable access to and the connection of vertical space, its form has essentially required little (functional) change²¹. Its devising was an evolution of the ladder from useful-and-portable-but-rather-awkward-to-use-and-dangerous-tool, to fixed-but-far-more-easily-navigable-and-safer-technology, a simple response to simple practical needs for increased stability and fixity in certain circumstances. Whilst the stair thus evolved from the same root cause and purpose as the ladder – the need and desire for the creation of vertical space and access to it – it went on to serve different needs and circumstances in which fixity, stability and gentler pitch were of greater benefit than the portable manoeuvrability of the ladder²².

It appears that once the stair's essential form had been devised and implemented as an evolution from the ladder - the earliest known examples of this are at Catal Huyuk (Anatolia) 6000 BCE and Ostia, Oa Antica (Italy) 4000 BCE - to its early users, little else about it required change, in terms of ensuring its basic functionality and safety²³. But despite this very early resolution of fundamental form according to function, the stair *has* changed considerably over time in other ways. From this pragmatic beginning, it has somehow become as the architect John Templer explains in his book *The staircase: history and theories*, 'poetic delight, monument, literary metaphor, art object, religious symbol, political icon, demonstration of power, status symbol, and social setting', suggesting a level of socio-cultural engagement and spatial appropriation that has extended its evolutionary trajectory far beyond that of the

purely functional²⁴. This range of identities and meanings we now associate with the stair has in fact become so extensive, convincing and important to us, that they have frequently overshadowed its originating purpose and technical function, in order that the stair may serve other aims altogether²⁵.

But despite, as this thesis will demonstrate, this now lengthy history of appropriation and apparent approbation, the stair's existence today is oddly indeterminate²⁶. In our high rise commercial and apartment buildings, the stair is now frequently only permitted to sneak entry furtively, as the fire escape. Relegated to a secondary, standby role, it can be hidden from sight, and therefore its potential, its multiplicand possibilities, can be entirely suppressed in favour of the purely functional once more²⁷. From basking in acclaim, as the grand centrepiece of seventeenth century Baroque processional 'theatre' for example, it has become not even a sideshow, but frequently, a no-show²⁸. Meanwhile, in our residential dwellings where it generally remains the most cost-effective and efficient enabler of vertical space and circulation it appears to have become a kind of amusing toy, a playful, diverting novelty, as apparently irresistible to architects as catnip to cats, and just as intoxicating, for both its ready availability to plunder and the short term high to be derived from its fanciful, fantastical resolution²⁹.

²⁰ A search of Victoria University's library catalogue for books dedicated to stairs reveals that of the twenty-one books found, fourteen are concerned primarily with practical matters (construction, tectonics, materiality, safety, dimensions / geometry) and six with aesthetics but only one attempts to address both (*Stairs: Second Edition*, by Alan and Sylvia Blanc).

²¹ Losantos, A. (2006) *Stair design*. p4.

²² Templer, J. A. (1992). *The staircase: history and theories*. pp18-19. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p60.

²³ Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p37. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p62.

²⁴ Templer, J.A. (1992). *The staircase: histories and theories*. p7. Godfrey, W. H. (1910). *The English staircase: an historical account of its characteristic types to the end of the eighteenth century*. p2.

²⁵ Braun, M. (2008). *Stairs: architectural details*. p9. Templer, J. A. (1992). *The staircase: history and theories*. pp18-19.

²⁶ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p238.

²⁷ Allen, E. (2005). *How buildings work: the natural order of architecture*. pp216, 226. Day, C. (2002). *Spirit and place*. p117. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p215, 221, 228. Spens, M. (1995). *Staircases: Detail in Building*. p6. Harbison, R. (1998). *Thirteen ways: theoretical investigations in architecture*. p37. Templer, J.A. (1992). *The staircase: histories and theories*. p60. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp3, 30. Chartered Institute of Building Services Engineers (CIBSE). (2005). *Transportation systems in buildings, CIBSE guide D*, 3rd ed. p2-9.

²⁸ Allen, E. (2005). *How buildings work: the natural order of architecture*. pp216, 226. Templer, J. A. (1992). *The staircase: history and theories*. pp124-125. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p131. Habermann, K. J. (2003). *Staircases: design and construction*. pp12, 18, 102. Spens, M. (1995). *Staircases: Detail in Building*. p8, 10-11. Kostof, S. (1995). *A history of architecture: settings and rituals*. p379. Trabucco, D. (2010). *Historical evolution of the service core*. p42.

²⁹ As the six books (including for example, *Stair design* by A. Losantos (2006)) that are primarily concerned with the aesthetics of stairs, in the Victoria University School of Architecture and Design library, demonstrate. Exner, U. and Pressel, D. (2009). *Spatial Design*. p38.

Figure 4: Simple stair at the Roman settlement of Beleida

Figure 5: Reception of Le Grand Conde at Versailles by Louis XIV (1878) by Jean Leon Gerome (1824-1904)

Figure 6: The grand staircase of the Paris Opera (1875) by Charles Garnier (1825-1898)

Figure 7: Stair in private residence

Figure 8: Contemporary fire escape

iii. Incuriouser and Incuriouser

As to the reason for the stair's poetic-pragmatic paradoxical extremity and in-between indeterminacy, superficially, it would seem that the explanation given above is sufficient to account for this; once functionality (and therefore survival) is ensured, it appears to be human nature to embellish, literally and figuratively³⁰. By extension it is logical that both the scale of, and our uniquely intimate relationship with, our built environment should see this epitomised in our built endeavours. Conversely, if cost is a consideration, embellishment beyond what is absolutely necessary is generally removed³¹. The two conditions may also co-exist within the same building, whether for economic, socio-cultural or other reasons; embellishment may be reserved for public display while private areas are less elaborately treated. But something is missing. Although convenient, this explanation does not actually address the question as to why, of all built components, stairs, should have become an extreme exemplar of this architectural poetic-pragmatic paradox, and it does not explain our indifference and incuriosity at our own superficial treatment of them³².

iv. The Evidence for Indeterminacy: Publishing a Paradox

This extreme duality, odd indeterminacy and indifference is evident not just in our treatment of the stair in our constructed environment however, but in the publications we produce too³³. In these, the stair is typically either allocated to the practical realm of services, circulation or access (in which case its poetic nature is severely dehydrated so as to conform to the appropriate level of dullness); or is alternatively awarded the status of architectural porn as a coffee-table tome in which, Photoshopped to glossy perfection, every turn of the page reveals another centrefold straddled by a seductively lit stair for designers to salivate over while they

³⁰ Brolin, B. C. (1985). *Flight of fancy: the banishment and return of ornament*. pp1-2. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p1. Clark, K. (1971). *Civilisation*. p3. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp12-13. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. pp2, 38. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp261-262, 272. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp30-35. Padovan, R. (1999). *Proportion science philosophy architecture*. p60. Botton, de. A. (2006) *The architecture of happiness*. p212.

³¹ Allsopp, B. (1974). *Towards a humane architecture*. pp13, 21-23. Kostof, S. (1995). *A history of architecture: settings and rituals*. p13. Losantos, A. (2006) *Stair design*. p4. Allen, E. (2005). *How buildings work: the natural order of architecture*. pp10, 237-238. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p26.

³² Goldberger, P. (2009). *Why architecture matters*. pp37-38.

³³ A search of Victoria University's library catalogue for books dedicated to stairs reveals that of the twenty-one books found, fourteen are concerned primarily with practical matters (construction, tectonics, materiality, safety, dimensions / geometry) and six with aesthetics but only one attempts to address both; *Stairs: Second Edition*, by Alan and Sylvia Blanc.

vacillate between envy and worship³⁴. In either case, the stair is invariably isolated from any wider context – the building, the larger entity of which it is a part, with which it forms a whole - and is typically referred to (variously) as an ‘episode’, a ‘feature’, an ‘element’, an ‘entity’ or a ‘component’. In this manner it is set apart from the ‘real’ architecture – presumably the building that houses - it and which it was built to serve, thus further isolating the stair and emphasising its position as an oddity or peculiarity, a kind of architectural excess or outsider³⁵.

v. The Outsider

Ironically, the stair’s original position was literally just that, an outsider. Humanity, current knowledge suggests, did not attempt to build terraced or multi-storey dwellings until around about 6000 BCE, and when such structures began to emerge, it was the ladder - portable and placed externally that enabled them - and the ladder’s retraction that protected them³⁶. The evolution of vertical travel has been a slow affair, and the stair a bashful but insidious creature. Over thousands of years and from humble origins as a collection of rocks piled against a hill or wall to make ascent or descent a little easier it has sidled its way shyly into our constructed lives, first working its way up to them then gradually across the threshold into them and then increasingly, further up within them³⁷. It has leaned against our buildings, adjoined them, united them, divided them, passed over them, burrowed beneath them, enabled them, and yet, for all this, it would appear that we still do not regard it as being quite *of* them. The stair it would seem, we have regarded, and still regard, as having a close relationship to architecture, but is not to be considered architecture, in itself³⁸.

³⁴ And the link to sex is not as far-fetched as it may sound either – Freud equated stairs and the act of climbing them with sex, see Freud, S. (2008). *The interpretation of Dreams*. p173. See also Baldon, C. and Melchior, I. (1989) *Steps and stairways*. p18. and ‘Curious’ (as Sir Henry Wotton described the stair), has a long history of being used as a classification by booksellers for erotic or pornographic books (‘curious’. *Shorter Oxford English dictionary*. p584.) For a coffee-screen equivalent of stair pornography, see <http://www.stairporn.org/>. New Zealand architect Claude Megson used to say ‘if it doesn’t have meaning then you’re just wanking’ (Cresswell, P. (undated). *What is architecture?* (online.)) which, with regard to the stair, could suggest why it’s such a popular plaything amongst architects.

³⁵ Hagan, S. (2001). *Taking shape: a new contract between architecture and nature*. p10.

³⁶ Templer, J.A. (1992). *The staircase: histories and theories*. p15-16.

³⁷ Habermann, K. J. (2003). *Staircases: design and construction*. p10. Porsolt, D. I. V. (1981). *The history and design of vertical communication*. p1. Farrelly, L. (2007). *The fundamentals of architecture*. p38. Kostof, S. (1995). *A history of architecture: settings and rituals*. p50. Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p9. Gelernter, M. (1995) *Sources of architectural form: a critical history of Western design theory*. pp21, 27.

³⁸ Spens, M. (1995). *Staircases: Detail in Building*. pp7-8. Alberti, L. B. and Rykwert, J. [trans.] (1991). *De re aedificatoria*. p31. Habermann, K. J. (2003). *Staircases: design and construction*. p14. Templer, J. A. (1992). *The staircase: history and theories*. p72. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp113-114. Salmon, W. (1767) *Palladio Londinensis*. pp112-119. Alberti, L. B. and Rykwert, J. [trans.] (1991). *De re aedificatoria*. p31. Venturi, R. (1977). *Complexity and contradiction in architecture*. p52. Godfrey, W. H. (1910). *The English staircase: an historical account of its characteristic types to the end of the eighteenth century*. pv.

vi. But Why Would The Stair *Not* Be Considered Architecture?

Although a somewhat startling thought, given its apparently lengthy history of being just that, there are a number of reasons why, if we actually pause sufficiently long enough to give thought to the matter, this might be so.

vi.i An Inconvenient Truth

From a practical perspective, it has to be admitted that stairs are frequently irritating. They are undoubtedly useful, but they are also thoroughly *inconvenient*; they take up a vast amount of space (where often there is not much to be had and / or it is expensive to obtain), are complicated to construct, dangerous if poorly designed (still dangerous in fact even if well designed), can create structural weakness and they can seriously complicate and delay the successful resolution of the floor plan³⁹. The inconvenience to the designer, builder, engineer or averagely healthy user pales in comparison however to that experienced by anyone who suffers from some degree of impairment, whether physical or sensory, health or age related, permanent or temporary, that can affect the sufferer’s ability to cope with stairs. In these circumstances, as a barrier to freedom of movement stairs can render the space to which they lead as impenetrable as that of any fortress⁴⁰.

Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. pp202-203.

³⁹ National Association of Home Builders (NAHB). (1992). *Stair Safety: A review of the literature and data concerning stair geometry and other characteristics*. p1. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p237. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp87-88, 126-127. Allen, E. (2005). *How buildings work: the natural order of architecture*. pp251, 253, 256. Kostof, S. (1995). *A history of architecture: settings and rituals*. p13. Ching, F. D. K. (2007). *Architecture: form, space and order*. pp286-287.

⁴⁰ State Services Commission. (2008). *Enabling ability: meeting the employment requirements of people with disabilities in the public service*. p4. Ministry of Health. (2004). *Living with disability in new Zealand*. (online). Beaulieu, F. G. D., Pelland, L., Gordon, D. and Robertson, A. (2007). *Kinetic analysis of forwards and backwards stair descent*. p564. Saywell, N. (2010). *Age dependent differences in attenuation of vertical ground reaction force during a step descent*. pp8, 33-34. Statistics New Zealand. (2007). *2006 disability survey*. pp16, 31. Statistics New Zealand. (1998). *New Zealand now – 65 plus (census 96)*. pp63-64, 67.

vi.ii. Ornamental or Essential?

I have seen a cat without a grin, but I have never seen a grin without a cat⁴¹.

Of course, one may avoid all such issues altogether; it is possible to have a building without a stair⁴². But therein lies another dilemma and curiosity. With the exception of a stair intended to access a view, what is the nature of a stair without a building? In architecture, such an entity, stripped of its practical purpose, would likely typically be termed either a folly (in the traditional sense of the word, a possibly well meant, but ultimately misguided, architecturally inclined ornament), a ruin (in the classically romantic sense of a forlorn and useless but sentimentally precious remnant of some unremembered and long-disappeared building) or, possibly the most disconcerting prospect of all to a modernist architectural ego, *a sculpture*⁴³. At any rate, with its fundamental raison d'être – vertical access – removed, such a stair is reduced to a source of, at best, indulgent amusement or, at worst, derisive ridicule. This then is the secret shame of the stair; while useful, in that they enable us to extend ourselves vertically (and *now* necessary in our contemporary high rises for safety reasons), as a built construction, they were not immediately, fundamentally, *essential*⁴⁴. The urgency of purpose that is inherent in the roof and wall, that drove their creation as providers of shelter and

enclosure, does not exist in the stair. The stair does not keep us dry as a roof does or create the security of an 'inside' to separate us from a harsh 'outside', as walls do⁴⁵. We can manage without stairs, but the comfort and protection, the *shelter* of a roof or wall is much harder to forgo⁴⁶. And even though the concepts of space, place, occupation, dwelling and territory are culturally specific and may vary greatly in significance and value between cultures, for many, the space of enclosure the roof and wall can create is not valued for physical comfort only but for mental and spiritual wellbeing also; for providing *place* within which they enable us to *dwell*, and so accommodate needs for comfort, privacy and safety⁴⁷.

⁴¹ Dodgson, C. L. (1865). *Alice in Wonderland*. (available online).

⁴² Scott, A. (2005). *Falls on stairways – literature review*. p25. Bergera, S.E. Theuring, C. and Adolph, K.E. (2007). *How and when infants learn to climb stairs*. p47.

⁴³ Descrochers, B. (2006). Ruins re-visited: Modernist conceptions of heritage. In Madge, J. and Peckham, A. (Ed[s.]), *Narrating architecture: a retrospective anthology*. (pp189-190). Padovan, R. (1999). *Proportion science philosophy architecture*. p346. St. John Wilson, C. (2000). *Architectural reflections: studies in the philosophy and practice of architecture*. pp50, 63. In this thesis, the contemporary re-interpretation of the folly by Tschumi as a being created to deliberately provoke thought and question assumptions lies outside of the scope but is acknowledged. This thesis adheres to the following definition; 'Folly: a costly but useless structure built to satisfy the whim of some eccentric and thought to show his folly.' (2000). *The penguin dictionary of architecture and landscape architecture*. p197, LE 1570-1599 xliiv. This definition certainly seems to apply in the case of the milkman Teyve in the musical Fiddler on the Roof who, on contemplating the prospect of becoming excessively wealthy imagines the delightful prospect of being able to display it by indulging in such ridiculous frivolities as the building of a house that includes no less than three staircases; one just for going up, another just for going down, and one going nowhere at all, 'just for show'. Stein, J., Bock, J. and Sheldon, H. (1992) Fiddler on the roof. p22. In Templer, J.A. (1992). *The staircase: histories and theories*. p49. Headley, G and Meulenkamp, W. (1999) *Follies: Grottoes and garden buildings*. p8. 'Ruin: the state of a fabric or structure which has given way and fallen down; esp., the collapsed condition of a building.' Brown, L. (2007). *The Shorter Oxford English dictionary*. p2628. Quantrell, M. (1974). *Ritual and response in architecture*. p12, 95-100, 112-113. Cook, P. (1967). *Architecture: action and plan*. pp10, 14-18. Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. p139. Hartoonian, G. (2006). Frank Gehry: roofing, wrapping, and wrapping the roof. In Madge, J. and Peckham, A. (Ed[s.]), *Narrating architecture: a retrospective anthology* (pp36-69). Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p112. Harbison, R. (1998). *Thirteen ways: theoretical investigations in architecture*. p4. Harries, K. (2000). *The ethical function of architecture*. p218.

⁴⁴ Padovan, R. (1999). *Proportion science philosophy architecture*. p36. Oliver, P. (1997). *Encyclopaedia of vernacular architecture of the world*. p347.

⁴⁵ Hatton, B. (2006). The Problem of Our Walls. In Madge, J. and Peckham, A. (Ed[s.]), *Narrating architecture: a retrospective anthology* (p177). de Botton, A. (2006). *The architecture of happiness*. p18. Harries, K. (2000). *The ethical function of architecture*. pp141, 205, 244. Oliver, P. *Dwellings: the house across the world*. p104.

⁴⁶ Oliver, P. (1997). *Encyclopaedia of vernacular architecture of the world*. p347. Lawson, B. (2001). *The language of space*. pp10, 16-18, 165-167, 175-176, 186-187. Bourdier, J-P. (1990). Introduction In. Bourdier, J-P. [Ed.] *Dwellings, settlements and tradition: cross-cultural perspectives*. (p7). Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp239-230. Exner, U. and Pressel, D. (2009). *Spatial Design*. p9.

⁴⁷ Oliver, P. (1997). *Encyclopaedia of vernacular architecture of the world*. p347. Lawson, B. (2001). *The language of space*. pp10, 16-18, 165-167, 175-176, 186-187. Bourdier, J-P. (1990). Introduction In. Bourdier, J-P. [Ed.] *Dwellings, settlements and tradition: cross-cultural perspectives*. (p7). Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp239-230. Exner, U. and Pressel, D. (2009). *Spatial Design*. p9. Harries, K. (2000). *The ethical function of architecture*. pp95, 174-175. Allsop, B. (1974). *Towards a humane architecture*. p37.

vi.iii. Inhabiting Space and Creating Place – A Diagonal Dilemma

Legend has it that the Greek philosopher Diogenes of Sinope (404-323 BCE) lived in a tub⁴⁸. Legend also has it that he lived in a barrel⁴⁹. Aside from whether either circumstance is true or not (and apparently either may have been the least of his eccentricities), most of us would acknowledge that with the exception of bathing, the spatial confines of either a tub or a barrel are generally inadequate for the majority of activities in which we might wish to engage⁵⁰.

The facilitation of activities for dwelling, or occupation of space for other purposes tends to be a rather fundamental expectation of our built endeavours (architectural or not)⁵¹. But to inhabit, to make place, we need space, and that space must be convenient in form and proportion for our needs⁵². The diagonal nature of the stair pays no attention to this fact, it splines space in ways that are at odds with the vertical or horizontal positions our bodies are accustomed to perceiving and processing and taunts us with this fact on a daily basis⁵³. Of course, correctly designed and built to legally compliant measurements and proportions (arrived at as a combined result of numerous centuries of general usage and several centuries

of slow, careful investigation), a stair can generally fulfil its primary purpose, that of facilitating vertical transit admirably⁵⁴. Unfortunately, the unique and peculiar zig-zag form of the stair, the constrained dimensions (of risers) and proportions required of it to do so and the imposition of its incline upon the horizontal plane, in turn result in the presence of space or spaces that are likewise so peculiar that they are frequently of little use for (and in fact a hindrance to) facilitating a great deal else⁵⁵. Unlike a roof, which if flat may be lived on as well as beneath, or a wall that can become roof also, the stair, in its typical pragmatic form (as usually required by building codes) is unable to easily (or safely) accommodate sleeping, cooking, quarrelling, dining, bathing, worship, toileting, study, love-making, socialising, fighting, work or any of the typical activities in which we spend our days, (and which for the most part we typically require reasonably large horizontal surfaces and sufficient headroom)⁵⁶.

⁴⁸ Mazella, D. (2007). *The making of modern cynicism*. p25.

⁴⁹ Navia, L.E. (1996). *Classical cynicism: a critical study*. pp82-83. Ballantyne, A. (2002). Introduction. In Ballantyne, A. (Ed.), *What is architecture?* (pp1-2). Ballantyne, A. (2002). The Nest and The Pillar of Fire. In Ballantyne, A. (Ed.), *What is architecture?* (pp9-10).

⁵⁰ Allen, E. (2005). *How buildings work: the natural order of architecture*. p20. Mazella, D. (2007). *The making of modern cynicism*. pp25-26.

⁵¹ Kostof, S. (1995). *A history of architecture: settings and rituals*. p21. Cook, P. (1967). *Architecture: action and plan*. p9.

⁵² Oliver, P. (1997). *Encyclopaedia of vernacular architecture of the world*. p421. Allen, E. (2005). *How buildings work: the natural order of architecture*. p19. Maslow, A. H. (1962). *Toward a psychology of being*. pp216. Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p1. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp34, 50-55, 73-74, 281-285. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p225

⁵³ Oliver, P. (1997). *Encyclopaedia of vernacular architecture of the world*. pp61, 421. Goldstein, E. B. (2010). *Sensation and perception. eighth edition*. pp116. Hendricks, B.E. (2001). *Designing for Play*. p77. Exner, U. and Pressel, D. (2009). *Spatial Design*. p39. Kluzik, J., Horak, F. B. and Peterka, R. J. (2007). *Postural after-effects of stepping on an inclined surface*. pp93, 96-97. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp249, 91, 275, 291-292. Malnar, J. M. and Vodvarka, F. (1992). Calbris, G. (2008). From Left To Right: Coverbal Gestures and Their Symbolic Use of Space. pp47-48. In Cienki, A. and Muller, C. [Ed.s]. *Metaphor and gesture*. (pp27-53). Humans are better able to perceive these orientations than others such as inclines. This is known as the oblique effect and it has evolved in response to the predominance of the horizontal / vertical orientations in our environments, natural and built. Consequently, we are often quite inaccurate at estimating angle and pitch. Goldstein, E. B. (2010). *Sensation and perception. Eighth edition*. pp116, 417-418. McMahon, M. and MacLeod, D. I.A. (2003). *The origin of the oblique effect examined with pattern adaptation and masking*. pp230, 234-236. Marius van Hof, W. and Lagers-van Haslen, G. C (1994). *The oblique effect in the human somatic sensory system*. pp259-260, 262. *The interior dimension: a theoretical approach to enclosed space*. p237. Baowang, L., Peterson, M. and Freeman, R. (2003). *Oblique effect: a neural basis in the visual cortex*. pp204, 211-112. The neurologist Oliver Sacks has documented the case of a gentleman, a 93 year old ex-carpenter who, suffering from Parkinsonianism (and whose tilting reactions and postural reflexes were therefore impaired), could not walk upright but tilted approximately 20 degrees coronally and could not see, until presented with a video of himself walking, that he *did not* walk upright. The shock to the patient when confronted with the evidence of his oblique, unnatural, posture was profound. The treatment involved building a spirit level into his glasses so that with the aid of a perpetual visual reference, literally, right in front of his nose, he was able to orient and retrain himself to walk upright / normally again. Sacks, O. (1998). *The man who mistook his wife for a hat: and other clinical tales*. pp71-76.

⁵⁴ See section 1.4.4 *Scientific Curiosity: An Ergonomic Advance*, page78

⁵⁵ With the exception of accommodating oddly shaped cupboards which in accordance with universal law, are somehow always just that little bit too small and awkward to contain everything within them and extract things from easily, and which are doomed to become a repository for junk or sporadically used items that do not belong conveniently anywhere else. This has been going on for a long time; Palladio suggested in his *Quattro Libri* (1570) that stairs 'will be practical in relation to the whole building' if in addition to them not being too steep, 'the arches underneath them can serve as storerooms for essential household things' thereby implying that if a stair must be present, then it should justify its existence by serving more than one purpose. Palladio, A., Tavernor, R. and Schofield, R. [Trans.s]. (2002). *The four books on architecture*. p66. Templer, J. A. (1992). *The staircase: history and theories*. p42.

⁵⁶ Allen, E. (2005). *How buildings work: the natural order of architecture*. pp20-21, 166. Hartoonian, G. (2006). Frank Gehry: roofing, wrapping, and wrapping the roof. In Madge, J. and Peckham, A. (Ed[s].), *Narrating architecture: a retrospective anthology* (pp39-51). Chueca, P. (2008). *Staircases selection and detail*. p86. Exner, U. and Pressel, D. (2009). *Spatial Design*. pp16-17. Department of Building and Housing. (2005). *Clause D1 - Access routes*. p14.

vi.iv. Awkward Spaces Become non-places?

A place is surely never less than a humanised space⁵⁷.

Rendered uninhabitable for any meaningful length of time, by purpose, necessity and design, the stair, and consequently the space it occupies, exhibits yet another paradox: that of a peculiar hybrid, a unique and extreme combination of function-dysfunction. Not a destination in itself, it does not possess the legitimacy of those spaces to which activities have been assigned (or which, albeit unintentionally, facilitate them) and which through repeated execution of those activities and thus occupation become *place*⁵⁸. Instead it is merely a space through which one passes, on the way to *somewhere*, some *place*, else⁵⁹. Placeless, they frequently become indeterminate - non-place - which perpetuates further indifference and dismissal, and in the absence of any desire for the space to become place, this indeterminacy becomes so accepted that it is not even ignored, it is just not noticed⁶⁰. Of course, it could be said that the successful stair would become precisely this, and through this nature it would *repel* habitation, *thwart* dwelling, to ensure that its fundamental purpose of enabling vertical movement could be maintained. In many instances this is the only desired outcome. The function of a stair as an enabler of human activity generally is different to the function of a room, or a function that has been assigned to a room, it is typically intended for transient movement and little else. But our general incuriosity as to whether it might, in addition, be anything else in terms of inhabitation also, is a strange circumstance, because the stair can quite capably accommodate both states; it is simply that, for the most part, we do not see this⁶¹. Our expectations of it are so clearly defined as provider of vertical circulation that we consciously think of it in few other ways. That said, it is interesting to note that while we may not consider the functional space of the stair itself of interest in terms of inhabitation, we have both consciously and unconsciously appropriated that space for more purposes with regards to spatial ordering than just enabling vertical connection.

The stair can and has been used also to divide space horizontally as well as vertically, to invite entry, to deny access, to create privacy, or open display, thereby fulfilling more than one function⁶². Even in this manner however, it is typically still an intermediary, a mediator of other spaces – it remains subservient in doing so.

Figure 9: Non-place by design, decree and general uninvitingness

Figure 10: The Spanish steps, Rome stairs become place the pleasure of finding a vantage point to meet, sit, gather and watch the world go by

⁵⁷ Platt, C. (2005). *The inhabited perimeter and the inclusive room*. p202.

⁵⁸ Exner, U. and Pressel, D. (2009). *Spatial Design*. p21. Herzberger, H. (2000). *Space and the architect*. p256. Auge, M. (1995) *Non-places: introduction to an anthropology of supermodernity*. pp77-83, 94. Coles, J. and House, N. (2007). *The fundamentals of interior architecture*. p16.

⁵⁹ Herzberger, H. (2000). *Space and the architect*. p256. Auge, M. (1995) *Non-places: introduction to an anthropology of supermodernity*. pp77-83, 94. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p239.

⁶⁰ Exner, U. and Pressel, D. (2009). *Spatial Design*. p19. Lawson, B. (2001). *The language of space*. p184.

⁶¹ See section 1.1.15 *Experimental Inhabitation: A Stair is a Stair is a?* page 100.

⁶² Evans, R. (1997). *Translations from drawings to buildings and other essays*. 56-57, 64-65. Rybczynski, W. (1986). *Home a short history of an idea*. pp37, 41, 66, 87-88, 108, 110, 165. Rosner, V. (2005). *Modernism and the architecture of private life*. pp63-64, 71. Rice, C. (2007). *Emergence of the interior: architecture, domesticity, modernity*. pp63, 73. Hatton, B. (2006). *The Problem of Our Walls*. In Madge, J. and Peckham, A. (Ed[s].), *Narrating architecture: a retrospective anthology* (p174). San Pietro, S. and Gallo, P. (2008), *Stairs/scale 2*. p7.

vii. Back to the Future - The Medieval Modern

This paradoxical existence of indeterminacy and indifference in which the stair now resides, an oddly estranged object, appears to have intensified with the onset of the late nineteenth century. At this time, new materials were being developed (concrete and reinforced steel), new construction methods were applied, the safety elevator was invented and widely adopted, land was sought after and as a result of all of these factors and an avaricious burst of capitalism, the skyscraper was born and the vertical city took off⁶³. Depending upon the context into which it was to be inserted, the usefulness of the stair fluctuated. In office and apartment buildings, with the introduction of the safety elevator in 1857, the stair's role became very much that of standby, indispensable, and eventually a legal requirement, but one that consumed (expensive) space so should therefore be compressed and constructed as cost efficiently as possible, in terms of both the space allocated to it and the quality of the materials used⁶⁴. In the private residence however, almost as if in rebellion against this imposition of control, and subject to less restrictions, the stair was and continues to be frequently exploited as outrageously as possibly as a sculptural toy, where fancies impossible elsewhere could be indulged to unfettered extremes⁶⁵. This divide continued to increase and it is now such that the stair appears to have returned to a strange blend of natures of almost medieval times; comprising an uneasy combination of crude, ubiquitous meniality on the one hand (the hidden helical stairs of the gothic cathedral or fortified castle tower) and a limited display of objectified rarity for the wealthy only, on the other (the experimental deviations of the open stair of King Francis I (1494-1547) at Blois).

Today, the stair continues to remain for the most part similarly suppressed, removed from sight; in a skyscraper its ubiquity and meniality is just now encased in a concrete, fireproof stairwell or if for a residential house, within a jealously guarded private interior⁶⁶.

Figure 11: Medieval spiral stair

Figure 13: Bespoke staircase for private residence

Figure 12: Contemporary fire escape stairwell

⁶³ Quantrill, M. (1974). *Ritual and response in architecture*. p108. Bukowski, R. W. (2009). *Emergency Egress from buildings. part 1: history and current regulations for egress systems design*. p167. Bradley, S. (2007). *St Pancras Station*. p108. Sennot, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. p753. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p35. Slaton, A. E. (2001). *Reinforced Concrete and the Modernization of American Building, 1900–1930*. pp16–18, 118. Timberman, J. (2003). *The footprint of the twentieth century: American skyscrapers and modernist poems*. p104. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p178.

⁶⁴ Quantrill, M. (1974). *Ritual and response in architecture*. p108. Scott, A. (2005). *Falls on stairways – literature review*. p2. Sennot, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. p459. Spens, M. (1995). *Staircases: Detail in Building*. p6. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p3.

⁶⁵ This may be especially true in countries where building code regulations are frequently left unenforced, see; Human Settlements Programme. (2007). *Enhancing urban safety and security: global report on human settlements 2007*. p207. or it may occur as a consequence of less restrictive residential building codes, see; Ching, F., Winkel, S. R. and the International Code Council. (2007). *Building codes illustrated: a guide to understanding the 2006 international building code*. p8. Exner, U. and Pressel, D. (2009). *Spatial Design*. p38. Gwilt, J. (1842). *An encyclopaedia of architecture: historical, theoretical, and practical*. p763. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp176, 222–223. San Pietro, S. and Gallo, P. (2008). *Stairs/scale 2*. p7. Platt, C. (2005). *The inhabited perimeter and the inclusive room*. pp201–202.

⁶⁶ Day, C. (2002). *Spirit and place*. p117. Allen, E. (2005). *How buildings work: the natural order of architecture*. pp216, 226. Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p215, 221,228. Ball, P. (2009). *Universe of stone: Chartres cathedral and the invention of the gothic*. p268. Harbison, R. (1998). *Thirteen ways: theoretical investigations in architecture*. p37. Templer, J.A. (1992). *The staircase: histories and theories*. p60. Exner, U. and Pressel, D. (2009). *Spatial Design*.p38. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp3, 30, 115.

viii. A Perpetual Problem - Schrödinger's Stair?

The question as to why humans have subjected the stair to such exaggerated treatment since its originating some 8000 years ago as a notched log - to the confectioned creations of the Baroque in the seventeenth century, to the dismissal as fire escape now - and then gone on to largely ignore the exaggeration itself need not be asked of course. We do not need to know what the stair is to architecture today or what it could be for it to continue to exist or to serve us and our needs for vertical circulation. But in the absence of the question, there is a void and it is in this void that the stair currently exists, as a kind of architectural Schrödinger's Cat, which as long as it remains entrapped and uninvestigated is condemned to exist in a perpetual stasis of superficiality, without investigation, there can be no outcome, there is only the stair as unknown; isolated by its own un-exploration, trapped in a superposition of disregarded potential, lost possibilities and perpetuated superficiality.

ix. Paradoxical Parameters: The Pleasure and Problems of Curiosity

Paradoxes are seductive notions, beguiling to us for both their inherent self-contradiction and apparent impossibility of resolution. They arouse our curiosity and vex our reason. The danger in their investigating however, or rather one of them, lies in their ability to seduce us to the point that we are incapable of determining if it is the subject of the paradox that is of interest or the impossible challenge of its resolution. With regard to the subject of this thesis then, the stair, there is a possible risk of a misguided enterprise, in that rather than the stair itself being inherently curious and therefore architecturally interesting, it merely appears so because of the way we ourselves have treated it, and the curiosity is in fact, all of our own instigation. Without investigation however, without determining exactly why the stair appears to be curious, and understanding to what degree our treatment of it may or may not have contributed to this appearance, there is no way to know which is the case. Unfortunately, this is the unavoidable quandary of all research, that a hypothesis may well be proved to be incorrect. Whilst this may be a disappointing outcome it is not an unhelpful one however; disproof of one theory may still generate knowledge that raises useful questions as to others and which provides a platform for their investigation. This thesis then, whilst aiming to prove the validity of the stair as architectural (inhabitory) place, will acknowledge if the opposite should occur and document the results and conclusions accordingly. One other particular problem as demonstrated by Schrödinger's unfortunate cat is that to investigate the paradox, one must open the box which contains the cat, thereby triggering a definitive

result. In other words, in seeking an answer, we influence the outcome. In the stair's case, as previously noted, the question as to what the stair is to architecture today and how its present day indeterminacy has eventuated need not be asked. The answer may become evident over time in any case; the stair may slowly metamorphose and manifest possibilities other than those currently evident without deliberate, objective study. Or, in the absence of awareness and questioning, *it may not*. Again, the only answer is that without looking, there may be no answer of any kind, and the chance to explore the possibilities of an altered architectural thought process is lost⁶⁷.

x. Where Am I?

Lost', is a fairly regular problem with regards to research investigation. When it is not entirely certain as to the nature of what is to be investigated, the question arises, how do you investigate it? Where do you start? What happens when an indeterminate object meets investigatory uncertainty?

This thesis takes its starting point from a preliminary investigation, documented briefly in this introduction, in which it appears that there is sufficient evidence to support the argument (despite superficial appearances to the contrary) that if architecture is interpreted as the endeavour of creating space for inhabitation, and therefore place that offers meaningful experience, the stair is not currently and has not historically been considered, by architects, to be architecture⁶⁸. On this preliminary basis, the aim of this thesis therefore is to demonstrate that the stair, when examined from an experiential, sensory perspective can be architecture in this sense, and offers many possibilities with regard to meaningful inhabitation and place-making.

This will be achieved using two methods, the first being a historical investigation and analysis, the second a process of research by design, to be guided by the knowledge gained from the investigation and analysis. With regards to the former - historical investigation - in his book, *Staircases, A History and Theory*, the architect John Tessler posits that in order to understand the stair, one must 'apprehend it from many directions' because it possesses multiple characters, or as he also terms them, 'disguises'⁶⁹.

⁶⁷ Hillier, B. (2007). *Space is the machine*. pp2-3. Till, J. (2009). *Architecture depends*. pp47, 151, 183.

⁶⁸ Coles, J. and House, N. (2007). *The fundamentals of interior architecture*. p16.

⁶⁹ Tessler, J. A. (1992). *The staircase: history and theories*. ppx, xi.

This thesis argues that whilst the supposition as to the stair evincing multiple characters is evident and that an appreciation of this is consequently necessary (in order to trace how we have treated the stair and it has arrived at its current state of architectural indeterminacy), the approach itself is problematic because it is based on a false premise; that these characters belong to and are manifestations of a stair that possesses a genuine architectural identity. It is argued that such an approach has actually been of detriment to understanding the stair's identity as architecture as it has simply perpetuated a succession of superficial and isolating notions and prevented curiosity as to and consideration of the stair as potentially habitable space. It is posited that we have apprehended and are willing to apprehend the stair from any direction that is convenient to us and serves any imagined purpose; every direction in fact *but* that of architecture, architecture as habitable place. Of course it is far easier and (often) infinitely more entertaining to take refuge in a range of artistic and symbolic projections and representations rather than consider reality - humans have a prodigious talent for mythologic invention - but the outcome of this capacity is such that the stair, like Schrödinger's cat, now appears to exist more in our heads than actuality, having become a succession of wishful thoughts, desires, imagineered fictions and fantastic dreams, rather than architectural, in the sense of habitable, inhabited, space, and place⁷⁰. This has led to a loss of architectural identity altogether.

xi. You Are Here - Mapping a Path

Having established this position it is argued that by understanding our treatment of the stair as a perpetuation of a false identity, we can then apply a different approach to its exploration, as the knowledge gained may be used to inform and guide the second method of investigation, research by design. Through this second method it is proposed that a series of design experiments aimed at apprehending the stair from the position of architecture as inhabitable place be devised and conducted. The experiments are intended to demonstrate the unrealised potential of the stair to contribute to inhabitory experience and generate a discussion as to the architectural identity of the stair and its potential to contribute to an experiential, inhabitable, architecture of meaning.

⁷⁰ Ponti, G. (1960). *In praise of architecture*. p116. Till, J. (2009). *Architecture depends*. p189. (See Fisher, T. R. (2000). In the scheme of things: alternative thinking on the practice of architecture. pp53-54. For a discussion on fictive architecture see; Harries, K. (2000). *The ethical function of architecture*. pp32, 92, 94, 118. For a discussion on primary and secondary functions and communication.) Coles, J. and House, N. (2007). *The fundamentals of interior architecture*. p16. Allsop, B. (1974). *Towards a humane architecture*. pp16-17. Platt, C. (2005). *The inhabited perimeter and the inclusive room*. p199.

The thesis comprises two parts and has been structured in the following manner;

PART ONE comprises this introduction and explanation as to the thesis aim, methodology and structure and the historical analysis and investigation of the stair in Western, European architecture and thought. The investigation is divided into four chapters. Chapter one aims to provide a context for the investigation by examining issues related to the development of the stair and its multiple identities and the broader context of architecture, including height, spirituality, time, scale, the body and disability. It is anticipated that this approach will determine the origins of the multiple characters of the stair so as to better understand the stair's present day indeterminacy and our indifference to this. Chapter two examines the treatment of the stair from Vitruvian times to the Renaissance, its development from the profane to the sacred and monumental, the emergence of the pragmatic-poetic divide, the use of the hidden helical stair in the Medieval gothic cathedral, the oddity of Michelangelo's Mannerist Laurentian Library Stair and Alberti's tactical planning as to managing Renaissance stairs. Chapter three investigates the development and migration of the grand stair as processional device from the garden, up to the exterior residential façade and into the interior and the social changes and shifts in through that prompted this development and that, led to the appropriation of the stair during the Baroque era as a theatrical means of creating visual spectacle and views. Chapter four is divided into two parts. The first half examines the troubled relationship between the stair and architecture in the seventeenth and eighteenth centuries and the increasing scientific curiosity and concern of the era as to the practicalities of constructional ergonomics, stair safety and comfort. The development of new materials and construction techniques, the emergence of the skyscraper and the impact of the elevator upon the stair in the nineteenth century are explored. The second half of the chapter explores unusual approaches to the development of design processes and volumetric and sensory spatial principles with regard to twentieth century residential architecture and provides case-studies of twenty-first century explorations of the stair as space become habitable place. PART ONE concludes by summarising the present day existence of the stair as both non-architectural space and potential architectural place, and notes opportunities to devise alternative approaches to its re-consideration as the latter.

PART TWO comprises the design investigation and documents the process by which a series of experiments, informed by the historical analysis, were devised and conducted in order to test the potential of the stair to exist as habitable space and contribute to the making of place. This section documents the findings of the design research and discusses their significance. Directions of possible future research are noted. PART TWO of the thesis concludes by summarising the argument and presenting the evidence for the reconsideration of the stair as an architecture of the twenty-first century; architecture as inhabitable place that engages us sensorily, physically, emotionally, spiritually and intellectually, to offer us new experiences and contemplations of architectural worth and meaning.

The next section, A Historical Investigation, will begin by contextualising the investigation through an examination of the issues that have influenced our development of the stair as pragmatic construction and poetic appropriation.

PART 1: A HISTORICAL INVESTIGATION

1.1 CLEARLY CURIOUS

Human affairs are so obscure and various that nothing can be clearly known⁷¹.

If the great Renaissance humanist Desiderius Erasmus Roterodamus (1456-1536) is to be believed and clarity of understanding of any aspect of human affairs is an impossible object, any attempt to achieve just that is a folly almost certain to lead to confusion and disappointment at best and despair and rage at worst, and for those of a Senecan tradition, possibly insanity as well⁷². However, whilst none of these outcomes is a happy one, in his essay *In Praise of Folly* (1509), Erasmus was not actually promoting the complete opposite and advocating acceptance of the pointlessness of human curiosity and enquiry in the face of complex and possibly unknowable matters⁷³. He merely wished to advocate for a more moderate approach towards the acquisition of knowledge and understanding than those exhibited by many of the philosophers and theologians of his time, with either their absolute avowals of belief as truth or total suspension of judgement⁷⁴.

At any rate, if the object of human affairs – the stair - with which this thesis is concerned appears unclear, for the confusing extent and variety of the paradoxes it appears to embody, it seems at least somewhat evident from preliminary investigations, that it *is* curious – which in the absence and fundamental unlikelihood of absolute clarity is as good a place as any to begin an investigation. This next section of the thesis then, rather than trying to ascertain the exact nature of the stair as architecture, not-architecture or maybe-architecture, rather sets out first to explore some of the other aspects of the conceptual and physical characteristics that we have infused and woven into, with and around the stair and our architecture in general. These other aspects of human affairs include ideas on and notions as to spirituality, religion, time, proximity, scale and the body – our biology, physiology, biomechanics, senses and perceptions. It is hoped that in this manner, whilst absolute clarity may not be readily forthcoming, this exploration will begin to identify some of the curiosities, contradictions and complexities that surround the stair and provide a basis upon which their historical treatment may then be more easily understood.

⁷¹ Erasmus, D. (1509). *In praise of Folly*. (online).

⁷² Rummel, E (2006). *Erasmus*. pp102-103. Botton, de. A. (2001). *Consolations of philosophy*. pp82, 85, 152, 153

⁷³ Pokin, R. H. (1960). *The history of scepticism from Erasmus to Descartes*. p5.

⁷⁴ Rummel, E (2006) *Erasmus*. pp102-103. Erasmus, D. and Rummel, E. (1990). *The Erasmus reader*. p186. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp401-403.

1.1.1 A Plethora of Paradoxes Uniquely Curious.

a stair is a stair is a stair

As noted previously, paradoxes are pleasurable things. They loop and writhe in the mind, slippery creatures, evading definitive capture, and an additional pleasure of the object of this enquiry – the stair - is that, uniquely among architectural elements, it appears to comprise so many of them. Even the stair's origins are suspiciously contrary. It evolved from a mobile technology – the ladder – and performs the same basic function, but in a very different way, such that it must be fixed if it is to be safely used. Its form has become situationally static so that we may be carelessly mobile⁷⁵. Of all our built elements, the stair is the most demanding. It requires the greatest interaction of us and is the most dangerous to us, but it is the one of which we are frequently most careless and the least aware⁷⁶. We may wish to avoid it but it is everywhere, a connection if you *can* use it, an impenetrable barrier if, for whatever reason, you cannot⁷⁷. The stair had one originating purpose but now has multiple acquired or invented functions and can be treated as anything from a serious technology to an architect and / or wealthy client's frivolous toy⁷⁸. The stair's uniquely jagged form is a playground for us as children when we love the physical exertion and advantage of height to be gained from their ascent, and a peril if we are aged, when we fear falling from it⁷⁹. And if this were not enough the contradictions and confusions continue.

⁷⁵ Templer, J. A. (1992). *The staircase: history and theories*. pp18-19.

⁷⁶ Saywell, N. (2010). *Age dependent differences in attenuation of vertical ground reaction force during a step descent*, pp8, 33-34. Reevesa, N. D., Spanjaarda, M., Mohagheghia, A.A, Baltzopoulos, V. and Maganarisa C. N. (2006). *The demands of stair descent relative to maximum capacities in elderly and young adults*. pp218-227. McNoe, B., Langley, J., Driscoll, T. and Feyer, A. (2005) *Work-related slip, trip and fall injuries in New Zealand*. pp1, 18, 22, 24, 28, 32, 43, 46. Scott, A. (2005). *Falls on stairways – literature review*. p10. Templer, J.A. (1992). *The staircase: histories and theories*. p23.

⁷⁷ Allen, E. (2005). *How buildings work: the natural order of architecture*. p10. Beaulieu, F. G. D., Pelland, L., Gordon, D. and Robertson, A. (2007). *Kinetic analysis of forwards and backwards stair descent*. p564. Bergera, S.E. Theuring, C. and Adolph, K.E. (2007). *How and when infants learn to climb stairs*. p36. Riener, R., Rabuffetti, M. and Frigo C. (2002). *Stair ascent and descent at different inclinations*. pp32–44. Novaka, A. C. and Brouwer, B. (2010). *Sagittal and frontal lower limb joint moments during stair ascent and descent in young and older adults*. p54. Beaulieu, F. G. D., Pelland, L., Gordon, D. and Robertson, A. (2007). Saywell, N. (2010). *Age dependent differences in attenuation of vertical ground reaction force during a step descent*, pp8, 33-34.

⁷⁸ Templer, J.A. (1992). *The staircase: histories and theories*. p7, 14. Exner, U. and Pressel. D. (2009). *Spatial Design*. p38.

⁷⁹ Teckline, J. S. (2008). *Paediatric physical therapy*. pp56–59. Sigelman, C. K., and Rioer, E. A. (2003). *Lifespan human development*. pp138-139. Damon, W. and Lerner, R. M. (2003). *Handbook of child psychology*. pp193-196 480, 494. Vogel, S. (2009). *Glimpses of creatures in their physical worlds*. p95 Singer, B. (2009). *Like sex with gods, an unorthodox history of flying*. p3. Herman, T., Inbar-Borovsky, N., Brozgol, M., Giladi, N. and Hausdorff, J. M. (2009). *The Dynamic Gait Index in healthy older adults: The role of stair climbing, fear of falling and gender*. pp239-240.

The stair embodies the simplest of principles and minimal components, but is considerably more complicated to effect (safely) in practice⁸⁰. We expect perfect (i.e. injury-free) performance from a stair - it exists to serve us - but we as its masters, cannot achieve that in our creating or using of it. We can create a *staircase* that may be monumental in size but *steps* must still be scaled to the size of our feet and the mechanics of our gait⁸¹. We will make a stair the magnificent focus of one space – beautifully crafted of expensive materials - and hide it from sight in another, begrudged of attention, poorly made and materially mean⁸². We have imbued the stair's ascent with positive associations of goodness, joy, light, reward, status and power and its descent with negative connotations of evil, misery, darkness, weight and disgrace⁸³. The stair then is not just a single paradox, but a veritable tangle of paradoxes - it is sacred and profane, ubiquitous and rare, mundane and exceptional, monumental and humble, great and small, beautiful and ugly, mysterious and overt, feted and feared, servant and star, symbolic and banal, intriguing and dull - such that the most fundamentally paradoxical question of all is how can something so minimal be so complicated?

After all, as the authors of *Steps and stairways* (1989) note, 'the stairway consists of treads and risers and something to hold them'⁸⁴. Not a very complicated shopping list certainly, and definitely not one that would suggest the possibility of spending a rainy day idly contemplating an enjoyable excess of contradiction. But there is something else afoot. The authors go on immediately (and this immediacy should be a clue as to the magnitude of the approaching caveat) to point out that 'there is much variety in that holding of steps and infinite elaboration on their surroundings, colours and materials'⁸⁵. In this brief sentence a world of potential trouble is let loose, as the equivalent of an architectural Pandora's jar is opened to wreak havoc upon the over-eager imaginations of unwary designers. This is not just because of the 'variety' of the stair itself, in its number of components, range of material choices, their finish, tectonics, shape and form, dimensions, pitch, scale etc. but for the same issues which apply to its possible contexts also – which may be equally limitless - thereby infinitising the elaborative possibilities to be had still further (if infinity can be tangled with in such a manner⁸⁶). So in fact, far from being a simple matter, between this allegedly minimal combination of components and infinite array of compositions and contexts lies all the potential for paradox, material and immaterial, for the beauty, complexity, uniqueness - and therefore the potentially, unpredictably, *tigerish* consequences - that Sir Henry Wotton's caution as to the staircase being a 'curious piece of Architecture' might imply⁸⁷.

⁸⁰ Department of Building and Housing. (2005). *Clause D1 - Access routes*. p14. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p13.

⁸¹ Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. pp57-58. Allen, E. (2005). *How buildings work: the natural order of architecture*. p167. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p237. CIBSE. (2005). *Transportation systems in buildings, CIBSE guide D*, 3rd ed. pp2-6.

⁸² Day, C. (2002). *Spirit and place*. p117. Allen, E. (2005). *How buildings work: the natural order of architecture*. pp216, 226. Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p215, 221, 228. Ball, P. (2009). *Universe of stone: Chartres cathedral and the invention of the gothic*. p268. Harbison, R. (1998). *Thirteen ways: theoretical investigations in architecture*. p37. Templer, J.A. (1992). *The staircase: histories and theories*. p60. Braun, M. (2008). *Stairs: architectural details*. p8.

⁸³ Barry, W. D. (2008). *Exposure, mutilation and riot: violence at the Scalae Gemoniae in early imperial Rome*. pp223-224. Templer, J. A. (1992). *The staircase: history and theories*. pp7, 36, 38, 47. Singer, B. (2003). *Like sex with gods: an unorthodox history of flying*. pp18-19. Clark, K. (1971). *Civilisation*. p2. Templer, J.A. (1992). *The staircase: histories and theories*. p34, 36. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p77. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp73-74, 89-90. Eliade, M. and Smith, J. Z. (2005). *The myth of the eternal return: cosmos and history*. pp12-16. Kliment, S. A. (2004) *Building type basics for places of worship*. pp11-12, 209. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p26. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp34-35. Harries, K. (2000). *The ethical function of architecture*. p192.

⁸⁴ Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p13.

⁸⁵ Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p13.

⁸⁶ Stewart, I. (2007). *The miraculous jar*. In Dawkins, R. (Ed.). *The Oxford book of modern science writing* (p290). Oliver, P. (1997). *Encyclopaedia of vernacular architecture of the world*. pp421-422. San Pietro, S. and Gallo, P. (2008). *Stairs scale 2*: see inside cover. de Botton, A. (2006) *The architecture of happiness*. pp207-208.

⁸⁷ Wotton, H. (1968). *The elements of architecture*. p57. San Pietro, S. and Gallo, P. (2008), *Stairs/scale 2*. p7.

1.1.2 (In)between: A Shock and a Hard Place

An atom of something in flux
in Schrodinger's box is the crux.
Of quantum prediction
And superposition
From the cat's point of view, it all *sucks*⁸⁸.

clowns to the left of me!
jokers to the right!
here I am stuck in the middle with you⁸⁹.

Inbetween is a difficult place to be. For a start, can it even be described as a place? Where is it? And assuming you can (eventually) work out where it is, and where, therefore, *you* are, can you leave it? It's no wonder the stair has grown up to experience something of an architectural identity crisis. Conceived out of the human desire to leave *somewhere* to go *somewhere else* it has been doomed to a lifetime of limbo – an uncertain, stuck-in-the-middle, wherelessness – ever since. The stair exists and always has, to serve our need for transit, vertically. A subservient element then, it acts as a connector of and bridge between levels. Of course, it can perform other functions also. It can contribute to the creation of a space of transition (as opposed to one of merely constant transit), it can mediate between spaces (places) designated to serve different functional programs and ease their joining, act as facilitator and reconciliator. Or it can divide them, permit privacy and control access, either visually, physically or both. It can be used to separate and delineate space horizontally as well as vertically. So the middle – flexible, versatile, is not perhaps such a bad place to be – unless of course you are the middle, and destined for perpetual servitude to other spaces – spaces accorded the coveted label of place – in which case we come, full circle, back to the question again of, from the stair's point of view, am I a place?

And if so, where am I?

It must be hard to be a stair.

Scarcely any subdivision of a building is of more importance than, as respects the character of the architect and the comfort and pleasant occupancy of it by his employer, than its principle and subordinate staircases. There is, moreover, no part, perhaps, in which more room is left for architectural and picturesque display⁹⁰.

Of course, another problem, while we're on the couch, so to speak, listening to the stair's lament, is not just the fundamental, originating inbetween-ness that ensures its perpetual condemnation to circulatory space (as opposed to achieving the kudos of designated *place*); there is also the question of, as the statement above demonstrates, its unfortunate malleability. Tigers are not, in general, very malleable. At least, live ones are not. The unleashing of large teeth and claws can rapidly quell ideas of that nature, no matter how apparently cuddly or benign other aspects of tiger-ness may appear. The stair possesses no such inarguable defences against unwelcome interference – at least the aesthetic kind. It may not be very forgiving of design error, poor engineering and ergonomic indifference (so even though we must concede that as far as a 'working' stair goes, functionality comes first) the stair, nonetheless, is a particularly malleable element of architecture, obligingly susceptible to and forgiving of aesthetic whimsy. Its ready acquiescence to a wide range of artistic, sculptural and poetic fancies and the potentially lesser cost of such whimsical tinkering compared to that of other architectural indulgences (the greater scale, expense and inconvenience of re-designing a roof plus the unpleasant consequences of getting it wrong tends, for example, to dissuade all but the most reckless or enthusiastic of would-be-D-I-Y-ers from acting upon idle thoughts of roof related re-modelling) have left it far more accessible and therefore vulnerable to becoming something of a plaything – a drier, smaller, less inconvenient and expensive one – to architects and clients alike. So in addition to *where* am I? (*any-where?*) as if this were not existentialist crisis enough, we also have the question from the stair, *who* am I? Am I Architecture? Or not? If not, what am I? A construction? A building? A structure, an element, a feature, an artefact, a sculpture, an object, a subject, a whole, a portion, a part, a piece? All, some, one or none of these? The philosopher Thomas Nagel once asked, *What is it like to be a bat?*⁹¹ Would it be so bad for architects to pause for a moment and ask what is it like to be a stair? What is it like to always be (in)between?

It must *suck* to be a stair

⁸⁸ Weissman, B. (undated). *Schrodinger's cat*. (online).

⁸⁹ Rafferty, G. and Egan, J. (1972). *Stuck in the middle with you*. Stealers Wheel. Leiber, J and Stoller, M [Prod.s]. Music recording.

⁹⁰ Gwilt, J. (1842). *An encyclopaedia of architecture: historical, theoretical, and practical*. p763.

⁹¹ Nagel, T. (1974). *What is it like to be a bat?* pp435-450.

1.1.3 A Primary Purpose

Owing to some fairly impressive symmetry, an adult tiger is capable of vertical leaps of over four meters; four times its own height⁹². Human symmetry is slightly less impressive in comparison. The women's world record for the high jump currently stands at 2.09m and the men's 2.45m, and both participants required a considerable run-up in order to perform these feats⁹³. Generally, through a combination of design, lack of health, poor fitness, possession of youth, age or disability (and aside from general disinclination), many humans would be hard pressed to manage a vertical leap of even half a meter⁹⁴. For many of us then, stairs divide what for us might be an otherwise insurmountably large gap in vertical levels into a series of smaller, horizontal micro-levels; staggered surfaces that, providing we possess reasonable fitness, mobility and agility we can use to bridge the gap, navigate without too much thought and effort and may therefore ascend or descend as the need or mood takes us⁹⁵.

Although as noted previously (page 4), the stair may now serve a multitude of purposes and aims and whilst the manner in which these and consequently the stair itself might be described and manifested may differ (according to the varyingly poetic-pragmatic inclinations of the describer), it is important to note that the stair possessed just one primary purpose and original driver, which is almost always described in identical fashion; the (easy) appropriation of and access to vertical space⁹⁶. Like most of the entities that comprise architecture then, its original devising stemmed from a pragmatic need and / or desire for advantage, in the stair's particular case, the minimisation of the earlier ladder's disadvantages to achieve the same purpose – height - but with greater advantage and ease⁹⁷. With this in mind, the Encyclopaedia Britannica notes;

As the main aim is usually to enable people and things to access spaces to achieve a specific goal, their degree of usefulness is generally conditional upon ensuring the ease with which this can be achieved⁹⁸.

Initially, as the affordance required – vertical travel – was simply programmatic, functionality

was the driver of the stair's form and their construction was a response to this, their users and location⁹⁹. In very early dwellings, such as those of Catal Huyuk and the Roman settlement of Ostia Antica in (6000 and 4000 BCE respectively), the simplicity of purpose did not require any excessive proportion, scale or adornment; the stairs comprised a plain form and mass that immediately communicated their purpose and fitness (or otherwise) for it¹⁰⁰. They were situated both internally and externally, it is thought to easily accommodate living patterns adjusted seasonally, and there are no indications that any status was attached to their presence. Vitruvius had not yet recorded his architectural expectations as to *Firmitas*, *Utilitas* and *Venustas*, but it would appear that *Firmitas* and *Utilitas* were all that was required at this time. *Their* delivery was sufficient and *Venustas* – beauty – was not yet a requirement also¹⁰¹.

1.1.4 On The Move? *Firmitas* and *Fixity*: Strange Expectations.

When a wise man is told that his suitcase has been lost in transit, he will resign himself in seconds to the fact. Seneca reported how the founder of stoicism had behaved upon the loss of his possessions: when Zeno received news of a shipwreck and heard that all his luggage had been sunk, he said, 'fortune bids me to be a less encumbered philosopher'¹⁰².

It is unlikely that many humans today, no matter what culture, would, and do, view an extensive loss of possessions with quite such equanimity as Zeno. Our possessions, however humble, are generally prized, whether for reasons such as they enable our survival, provoke our sentiments or (we believe), confer status¹⁰³. Whatever the reason, our attachment to physical things is frequently extensive and becomes particularly so with regard to our buildings, which shelter both us and those possessions to which we give meaning. In addition to our expectations of buildings that they *will* shelter and protect us (and our belongings) however, we also tend to expect them to both remain where we put them and continue fit for whatever purposes we designate them (whether the originating ones or not), for

⁹² Mills, S. (2004) *Tiger*. p11.

⁹³ The current men's record holder for high jump is Javier Sotomayor of Cuba (1993), the holder of the women's record is Stefka Kostadinova of Bulgaria (1987) <http://records.unitarium.com/athletic-records>

⁹⁴ Ministry of Health. (2004). *Living with disability in new Zealand*. (online). Reevesa, N. D., Spanjaarda, M., Mohagheghia, A.A, Baltzopoulou, V. and Maganarisa C. N. (2006). *The demands of stair descent relative to maximum capacities in elderly and young adults*. pp218-227.

⁹⁵ Allen, E. (2005). *How buildings work: the natural order of architecture*. p23, 164. Habermann, K. J. (2003). *Staircases: design and construction*. p23.

⁹⁶ Braun, M. (2008). *Stairs: architectural details*. p8. Templer, J.A. (1992). *The staircase: histories and theories*. p7.

⁹⁷ Blanc. A. and Blanc, S. (2001). *Stairs, second edition*. p60.

⁹⁸ zCIBSE. (2005). *Transportation systems in buildings, CIBSE guide D*, 3rd ed. pp2-3, 2-13.

⁹⁹ Habermann, K. J. (2003). *Staircases: design and construction*. p10. Losantos, A. (2006) *Stair design*. p4. Porsolt, D. I. V. the history and design of vertical communication. Study Paper. School of Architecture, University of Auckland, New Zealand. Auckland, School of Architecture, University of Auckland. p1.

¹⁰⁰ Spens, M. (1995). *Staircases: Detail in Building*. p7. Gelernter, M. (1995) *Sources of architectural form: a critical history of Western design theory*. p27. Blanc. A. and Blanc, S. (2001). *Stairs, second edition*. p62.

¹⁰¹ Templer, J.A. (1992). *The staircase: histories and theories*. p7. Gwilt, J. (1842). *An encyclopaedia of architecture: historical, theoretical, and practical*. p763. Spens, M. (1995). *Staircases: Detail in Building*. p7.

¹⁰² De Botton, A. (2001) *Consolations of Philosophy*. p108.

¹⁰³ Oliver, P. (2006) *Built to meet needs*. p210. Maslow, A. H. (1962). *Toward a psychology of being*. p32.

however long we desire¹⁰⁴. Aside from whether this is realistic or not (abundant historical and contemporary evidence would suggest not), *firmitas* – in the sense of that which has strength, durability, permanence, longevity, continuity – and which thus represents order, safety and security, has been and continues to be a key tenet of our architectural demands and expectations¹⁰⁵. Whereas mere buildings may come and go, and legal codification may ensure at least the former to some minimum standard even if it can't prevent the latter, *architecture* is *supposed* to endure, to defeat time; longevity has traditionally been an ethical imperative and / or a lasting legacy to demonstrate (sacred or secular) excellence and superiority¹⁰⁶.

Traditionally, the qualities we have attributed to those constructions that will give us this sense of order and surety are those that have solidity, fixity and which are static¹⁰⁷. These qualities underpinned centuries of western architectural traditions; the medieval requirement for the permanent expression and glorification of God, Renaissance notions of architecture as the Cosmos and Body perfect, and the Enlightenment, scientific, rational nature of the universe as a composite, meaningful system¹⁰⁸. Their materiality; weight, mass and fastness acts a reassuring anchor to our horizontal realm, shelters us from the vagaries of climate and weather, and imposes an order upon a decidedly un-ordered (at least to our wishes) and capricious natural world; or so we would like to believe¹⁰⁹.

- ¹⁰⁴ Goldberger, P. (2009). *Why architecture matters*. p52. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p158. Quantrill, M. (1974). *Ritual and response in architecture*. p105. Lawson, B. (2001). *The language of space*. pp18, 21, 201. Cook, P. (1967). *Architecture: action and plan*. p9. Exner, U. and Pressel, D. (2009). *Spatial Design*. p9. Rybczynski, W. (2001). *The look of architecture*. p4.
- ¹⁰⁵ United Nations. (2007). *Disaster risk reduction: global review*. p25. Schuemer-Cross, T. and Taylor, B. H. (2009). *The right to survive: the humanitarian challenge for the twenty-first century*. pp2-4. Till, J. (2009). *Architecture depends*. p79. Rybczynski, W. (2001). *The look of architecture*. p5.
- ¹⁰⁶ Scott, A. (2005). *Falls on stairways – literature review*. p10. Kostof, S. (1995). *A history of architecture: settings and rituals*. p12, 18-19. Hatton, B. (2006). *The Problem of Our Walls*. In Madge, J. and Peckham, A. (Ed[s].), *Narrating architecture: a retrospective anthology* (p176). Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. pp74, 82. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. p66.
- ¹⁰⁷ Cook, P. (1967). *Architecture: action and plan*. p29. Exner, U. and Pressel, D. (2009). *Spatial Design*. p31. Kronenburg, R. (2008). *Portable Architecture: Design Workshops at Domaine de Boisbuchet*. In Kiendl, A. (Ed.) *Informal architectures: space and contemporary cultures*. (p176.) Till, J. (2009). *Architecture depends*. p79. These expectations are firmly codified in our language – see Kövecses, Z., Benczes, R., Bokor, Z., Csábi, S., Lazanyi, O. and Nucz, E. (2010). *Metaphor: a practical introduction*. pp4, 6, 13, 19, 25, 35, 64, 92-93, 95-96, 121, 132, 136, 144, 150, 159, 276.
- ¹⁰⁸ Hagan, S. (2001). *Taking shape: a new contract between architecture and nature*. p129. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p286. Etlin, R.A. (1996). *Symbolic space: French enlightenment architecture and its legacy*. pp130-132. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p250. Padovan, R. (1999). *Proportion science philosophy architecture*. pp58, 162-163, 166-167, 243, 261, 273. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p76. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp532-533. Till, J. (2009). *Architecture depends*. pp28, 30, 34.
- ¹⁰⁹ Hagan, S. (2001). *Taking shape: a new contract between architecture and nature*. pp90-91, 129-130. Kostof, S. (1995). *A history of architecture: settings and rituals*. p12. Allen, E. (2005). *How buildings work: the natural order of architecture*. p3. Descrochers, B. (2006). *Ruins re-visited: Modernist conceptions of heritage*. In Madge, J. and Peckham, A. (Ed[s].), *Narrating architecture: a retrospective anthology*. (pp189-190, 199). Harries, K. (2000). *The ethical function of architecture*. p231. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of*

Like most of our endeavours however, the fixity and firmness of our buildings, and our stairs, whether either be considered architecture or not, are subject to an indefatigable enemy – time - and humans occupy a very small slice of it in the grand scheme of things, both individually and collectively¹¹⁰. Time and it's trifecta of sidekicks - the weather, climate and geology - are patient opponents of all humanity's endeavours. No matter how we may try and fight it, rot, decay, humidity, mould (frequently aided by pollution), damp and light are always present, waging a slow but constant war of attrition against all our constructed efforts¹¹¹. Buildings shrink, crack, warp, settle, creep and shift continually with changes in temperature and humidity and exposure to snow, ice, rain and sun¹¹². More rapidly and thus immediately disastrously, threats of fire, flood, wind and geological rebellion may invade our settlements at any moment¹¹³. In other words, our buildings are by no means as resilient, stable or static - as *orderly* and *impenetrable* - as we would like to think¹¹⁴. Death of architecture or any construction may be a slow or rapid affair, but time and the elements continually oppose humanity's desire for permanent affixing of ourselves to the landscape and our environment¹¹⁵. Ultimately, as Seneca (in de Botton) further notes;

the wise will start each day with the thought ... fortune gives us nothing which we can really own. Nothing, whether public or private is stable, the destinies of men no less than those of cities are in a whirl, whatever structure has been reared by a long sequence of years, at the cost of great toll and through the great kindness of the gods, is scattered and dispersed in a single day. No, he who has said 'a day' has granted too long a postponement to swift misfortune; an hour, an instant of time, suffices for the overthrow of empires.¹¹⁶

- production*. pp101-102. de Botton, A. (2006) *The architecture of happiness*. pp16-17.
- ¹¹⁰ Urry, J. (2001). *Sociology beyond societies, mobilities for the twenty-first century*. p120. Pagel, M. (2008). *We Differ Genetically More Than We Thought*. In Brockman, J. [ed.] *What have you changed your mind about: today's leading minds rethink everything*. (pp68-69). Exner, U. and Pressel, D. (2009). *Spatial Design*. p41.
- ¹¹¹ Allen, E. (2005). *How buildings work: the natural order of architecture*. pp239-240. Urry, J. (2001). *Sociology beyond societies, mobilities for the twenty-first century*. p120. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp218-221. Exner, U. and Pressel, D. (2009). *Spatial Design*. p41. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. pp66-67. de Botton, A. (2006) *The architecture of happiness*. p15.
- ¹¹² Allen, E. (2005). *How buildings work: the natural order of architecture*. pp204-205. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp155-156, 228-230.
- ¹¹³ Clark, N. (2010). *Inhuman nature: sociable life on a dynamic planet*. pp1-2, 53.
- ¹¹⁴ Allen, E. (2005). *How buildings work: the natural order of architecture*. pp204-205. Descrochers, B. (2006). *Ruins re-visited: Modernist Conceptions of Heritage*. In Madge, J. and Peckham, A. (Ed[s].), *Narrating architecture: a retrospective anthology*. (p193). de Botton, A. (2006) *The architecture of happiness*. p15. Hatton, B. (2006). *The Problem of Our Walls*. In Madge, J. and Peckham, A. (Ed[s].), *Narrating architecture: a retrospective anthology* (p177). de Botton, A. (2006) *The architecture of happiness*. pp178-180.
- ¹¹⁵ Clark, K. (1971). *Civilisation*. pp3-4. Till, J. (2009). *Architecture depends*. pp71, 74, 79, 98.
- ¹¹⁶ Botton, de. A. (2001). *Consolations of philosophy*. p91.

Aside from their contrary evolution from mobile origins to static fixture, stairs are also a particularly odd mix of fixity and impermanence¹¹⁷. It is not unusual to see an abandoned building without stairs, which, made of more transient materials have not survived the ravages of time or conversely, to see stone stairs still standing as a remnant of a building, when the timber walls and floors no longer remain¹¹⁸. In 1624, aside from noting the curiosity of stairs in his treatise *The elements of architecture*, Sir Henry Wotton noted also that a particularly good reason to pay attention to their Firmitas in terms of both tectonics and material selection was that they were 'most useful in fires' for effecting escape. Hence even if other elements of the building might succumb to collapse, the stairs should be very well looked to in terms of both materiality and construction technique to ensure that they did not¹¹⁹.

Figure 14: Ruined stair in Madame Sherri forest, Chesterfield. Lonely remnants of what was once a grand house, now lost to time and the elements.

Figure 15: Scene from the 2004 movie Lemony Snickett's A Series of Unfortunate Events, in which the Baudelaire children face the loss of their parents and the family home. The wooden walls of the house have succumbed to fire while the stone stair remains standing, a poignant reminder of what was.

1.1.5 A Geometer's Dream

The job of a foundation is to be firm as a rock. It is supposed to be inert, dead things are easier to handle than live ones. They may not be so interesting but they are less troublesome. From the point of view of the architect seeking firmness and stability, the best geometry is surely a dead geometry and perhaps that, by and large, is what architecture is made with. What I mean by a dead geometry is an aspect of geometry no longer under development from within dead geometry is an inoculation against uncertainty¹²⁰.

Leaving aside the intriguing question of rolling and other such foundations, if geometry is the foundation of our architecture and if Robin Evans is correct and the geometry upon which we still base the majority of our architecture is dead, it might be said that architecturally speaking, things on the stair front are looking especially listless nowadays¹²¹. This (desirably submissive) state would appear however to be in direct contradiction to the world in general which is as turbulent and uncertain as it ever has been, and possibly, if sociologists, anthropologists, humanitarian agencies and governmental bodies are to be believed, more turbulent than it has ever been¹²². As rather small and fragile objects in the scheme of things, we have typically liked to impose order upon our environments, to tame them so that they may function in accordance with *our* wishes and they will support us in our desire for the physical and mental comfort of safe shelter¹²³. In the face of many and ever present dangers, one of which is, social scientists say, the anxiety of the modern city, predictability and permanence is similarly comforting; we are not, in general, overly fond of uncertainty and instability - at least the potentially injurious kinds, to either our physical or mental wellbeing - and especially with regard to our buildings¹²⁴.

¹²⁰ Evans, R. (1995). *The projective cast: architecture and its three geometries*. p11.

¹²¹ Hatton, B. (2006). The Problem of Our Walls. In Madge, J. and Peckham, A. (Ed[s].), *Narrating architecture: a retrospective anthology* (p173).

¹²² Thrift, N. (2004). *Intensities of feeling: towards a spatial politics of affect*. p59. Thrift, N. (2005). *But malice aforethought: cities and the natural history of hatred*. p133. Latham, A. and McCormack, D. P. (2004). *Moving cities: rethinking the materialities of urban geographies*. pp704-705. Erlich, P. and Ornstein, R. (2010). *Humanity on a tightrope: thoughts on empathy, family and big changes for a viable future*. pp3-5, 7, 136. Schuemer-Cross, T. and Taylor, B. H. (2009). *The right to survive: the humanitarian challenge for the twenty-first century*. pp8-9. United Nations. (2007). *Disaster risk reduction: global review*. p25. Ellin, N. (2003). *Fear and city building*. pp59-61. Kronenburg, R. (2008). *Portable Architecture: Design Workshops at Domaine de Boisbucet*. In Kiendl, A. (Ed.) *Informal architectures: space and contemporary cultures*. (p174.)

¹²³ Oliver, P. (1997). *Encyclopaedia of vernacular architecture of the world*. p347. Lawson, B. (2001). *The language of space*. pp10, 16-18, 165-167, 175-176. Bourdier, J-P. (1990). Introduction In. Bourdier, J-P. [Ed.] *Dwellings, settlements and tradition: cross-cultural perspectives*. (p7). Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp239-230. Harries, K. (2000). *The ethical function of architecture*. pp228, 231.

¹²⁴ Thrift, N. (2004). *Intensities of feeling: towards a spatial politics of affect*. p59. Thrift, N. (2005). *But malice aforethought: cities and the natural history of hatred*. p133. Latham, A. and McCormack, D. P. (2004). *Moving cities: rethinking the materialities of urban geographies*. pp704-705. Ellin, N. (2003). *Fear and city building*. pp44-46, 48, 53-56, 59-61. Madge, J. and Peckham, A. (Ed[s].), *Narrating architecture: a retrospective anthology*. p159. Verschaffel, B. (2006). *The meanings of domesticity*.

¹¹⁷ Templer, J. A. (1992). *The staircase: history and theories*. pp18-19.

¹¹⁸ Cline, A. (1998). *A hut of one's own*. pp17-20.

¹¹⁹ Wotton, H. (1968). *The elements of architecture*. p57.

The desire to impose order – to tame – upon our constructions and an imperfect world, both poetically and pragmatically, extends as far back to Vitruvius and his declared intent to ‘bring the whole body of this great discipline to complete order’, an aim so grandiosely impossible that it has doomed classically inclined architects to inevitable and crushing disappointment ever since¹²⁵. Stairs are a particular aspect of our architectural world for which it would appear we are, and generally have been notably un-fond of uncertainty, possibly because they are responsible for so many of our architecturally related accidents and because even despite all our best efforts to ensure otherwise, even as we form them in accordance with our needs, to fit *our* form, to serve *our* intentions, they *still* cause us harm; apparently we are unable to completely prevent this¹²⁶. The stair then, has something of the miscreant about it; even though we have created it, it appears we – even with our dead and supposedly therefore certain geometry - cannot entirely tame it¹²⁷.

This is not for lack of trying however. On the contrary, the intense and longstanding effort that has been directed at achieving this makes the failure (as evidenced in our accident rate) even more vexing¹²⁸. Yet few other aspects of architecture are as tied to and thus supposedly subservient to the human body in terms of both scale, proportion and geometry as stairs are¹²⁹. Walls and columns may tower many meters above us while arches, lintels, domes and gables can span vast areas in comparison to our diminutive size¹³⁰. A window or door may comprise a tiny opening, a wall, an entire façade, a complete *envelope*¹³¹.

The scale and proportions of a staircase may vary, but the riser of a *step*, if it is to be easily usable by and accessible to humans must always conform to quite precise geometrical dimensions based on those of the human body and its biomechanical limits¹³². This is especially true with regard to the height of the risers, which are always dictated by the maximum limits of the human ability to step upwards¹³³. If the steps defer to a regular pattern of dimensional consistency, their use is likely to be both more comfortable and safer for us. Stairs then are simply, as architects Cleo Balden and Ib Melchior note ‘the upward extension of people walking with their configuration controlled by human size’¹³⁴. Whilst styles in architecture come and go according the values and desires of an era, and the scale of a staircase in its entirety may be manipulated to convey meaning and message, the stair’s zigzag *form* and gait linked *proportion* is so inescapably linked to its function that in this respect they have had to change very little since their origins some 8000 years ago¹³⁵. It would seem that the geometry and scale of the human body dictates the scale of the stair in a manner that is different to, and more rigidly defined, than any other architectural element, such as walls, columns, roofs, floors, windows and doors¹³⁶.

In Madge, J. and Peckham, A. (Ed[s].), *Narrating architecture: a retrospective anthology*. (p244). Goldberger, P. (2009). *Why architecture matters*. p47. Sagan, C. (2007). The demon haunted world. In Dawkins, R. (Ed.), *The Oxford book of modern science writing* (p242). Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. p268. Lawson, B. (2001). *The language of space*. pp19, 21. Pinker, S. (2007). The Language Instinct. In Dawkins, R. (Ed.), *The Oxford book of modern science writing* (pp106-107.) Ballantyne, A. (2002). The Nest And The Pillar of Fire. In Ballantyne, A. (Ed.), *What is architecture?* (p28). Till, J. (2009). *Architecture depends*. pp38, 54-55, 58. de Botton, A. (2006) *The architecture of happiness*. pp180, 183.

¹²⁵ Till, J. (2009). *Architecture depends*. pp14,30, 42. Harries, K. (2000). *The ethical function of architecture*. p228. Pelletier, L. (2006). *Architecture in words: theatre, language and the sensuous space of architecture*. p12. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. pp101-102. Hagan, S. (2001). *Taking shape: a new contract between architecture and nature*. p129.

¹²⁶ See section 1.1.8, page 26: *Dangerous Spaces – Terrible Tales and High Crimes*.

¹²⁷ McNoe, B., Langley, J., Driscoll, T. and Feyer, A. (2005) *Work-related slip, trip and fall injuries in New Zealand*. pp1-28. Kool, B., Ameratunga, S., Hazell, W. and Ng, A. (2010). *Unintentional falls at home among young and middle-aged New Zealanders resulting in hospital admission or death: context and characteristics*. pp1-2, 6. Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. pp8, 25, 111.

¹²⁸ McNoe, B., Langley, J., Driscoll, T. and Feyer, A. (2005) *Work-related slip, trip and fall injuries in New Zealand*. pp1-28. Kool, B., Ameratunga, S., Hazell, W. and Ng, A. (2010). *Unintentional falls at home among young and middle-aged New Zealanders resulting in hospital admission or death: context and characteristics*. pp1-2, 6.

¹²⁹ Templer, J.A. (1992). *The staircase: histories and theories*. p23-25. CIBSE. (2005). *Transportation systems in buildings, CIBSE guide D*, 3rd ed. p2-6.

¹³⁰ Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. pp51-61.

¹³¹ Allen, E. (2005). *How buildings work: the natural order of architecture*. p167. Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. pp57-58.

¹³² Allen, E. (2005). *How buildings work: the natural order of architecture*. p167. Heath, T. (2010) Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp52-53. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p237. Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. pp57-58. CIBSE. (2005). *Transportation systems in buildings, CIBSE guide D*, 3rd ed. p2-6.

¹³³ Templer, J.A. (1992). *The staircase: histories and theories*. p7. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p49. Allen, E. (2005). *How buildings work: the natural order of architecture*. p167.

¹³⁴ Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p13-14

¹³⁵ Losantos, A. (2006) *Stair design*. p4.

¹³⁶ Templer, J.A. (1992). *The staircase: histories and theories*. p7, 25-36. Saywell, N. (2010). *Age dependent differences in attenuation of vertical ground reaction force during a step descent*. p8 Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. p52. Bronzino, J. D. (1995). *The biomedical engineering handbook*. p17-24. Ozkaya, N. Nordin, M and Leger, D. (1999) *Fundamentals of biomechanics: equilibrium, motion, and deformation*. p5. Hoffman, S. J. (2009) Introduction to kinesiology: studying physical activity. p273. Whittle, M. (2007) *Gait analysis*. pp1-45. Hallet, M. (2004). *Movement disorders: neurologic principles and practice*. p642. Teckline, J. S. (2008). *Paediatric physical therapy*. pp56–59. Sigelman, C. K., and Rioer, E. A. (2003). *Lifespan human development*. pp138-139. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p237. Allen, E. (2005). *How buildings work: the natural order of architecture*. p165.

1.1.6 Taking a Walk: A Sensory Tour

You can't make a step how you like; it must be a special proportion. I spoke about that in the University at Gothenburg. The Rector ... came out with a book – Dante's Divine Comedy. He opened it at the page where it says that the worst thing in the inferno is that the stairs had the wrong proportion. Alvar Aalto¹³⁷

Walking is a very common human activity¹³⁸. It is also a very complicated business¹³⁹. Even to stand, the human body and mind must defy gravity and physics to learn the art of balance upon two legs (a distinct disadvantage compared to the more stable four of other animals). To walk demands the further ability to balance on one leg, as with each foot raised, our entire body weight and equilibrium is left dependent upon the other for stability and balance¹⁴⁰. This is not only a physical process however. Whilst in this perpetual state of imbalance we must learn to cognitively 'read' space also, to scan and process, and so traverse it, until through our repeated experience of identical or similar situations we develop the physical capability and mental expertise to identify obstacles or hazards that might impede our way or endanger us¹⁴¹. (Fortunately for humans, depth perception is usually well formed by the time locomotion begins to occur or an inability to recognise height at this point would likely have curtailed our evolution somewhat¹⁴².) Despite the initial 'wobble phase' and inevitable initial misjudgement and mishaps that will occur when engaged in mastering such a complicated process (especially when encased in a rather fragile form) humans are incredibly adept¹⁴³.

By the age of seven, unless we are impaired in some way, walking on a level, spacious surface can be performed in a sensorially relaxed manner; this extraordinarily complex, intricate - in fact *incredible* – process, has become, paradoxically, as automatic and unthinking as yawning or sneezing and completely forgettable to us¹⁴⁴.

Walking on stairs however, is an even more complicated (not to mention perilous) business¹⁴⁵. Despite the casual ubiquity of the stair, once built, it demands of us a greater level of bodily and sensory engagement and interaction than any other architectural construction¹⁴⁶. At a time when we most need increased physical precision and stability, our perpetual instability is actually more pronounced owing to the need to exaggerate the normal walking movements we would perform, and the decreased speed with which we can perform them¹⁴⁷. Our gait and movement through space is governed by the geometry and dimensions of treads and risers, the positioning of the walls or balustrades (or their absence) and the presence of hazards or obstacles¹⁴⁸. The additional, heightened sensory input and processing required to perform this activity, even if a walker is physically and mentally unimpaired, is considerable, and the potential consequences of a mistake occurring in that process, far more serious¹⁴⁹. It is not until an unexpected interruption in either sensory processing or physical action occurs however - when something as simple as a mis-step, an uneven stair tread, a disproportionate step, or an ill-placed banana skin, causes us to lose our balance, slip and even fall – that we are reminded abruptly of the unconscious nature of both the majority of our actions and our expectations as to the role of our constructions in enabling us to perform those actions¹⁵⁰.

¹³⁷ Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p25.
¹³⁸ Aminian, K., Najafi, B., Ula, C. B., Leyvraz, P.F. and Robert, P. (2002). *Spatio-temporal parameters of gait measured by an ambulatory system using miniature gyroscopes*. p689.
¹³⁹ McDowell, J. (Ed.) (2010). *Encyclopedia of body systems*. pp552, 595. Uyar, E.; Baser, Ö, Baci, R. and Özçivici, E. (undated). *Investigation of bipedal human gait dynamics and motion control*. Pp1-2. Whittle, M. (2007). *Gait analysis*. pp1-45. Hallet, M. (2004). *Movement disorders: neurologic principles and practice*. p642. Teckline, J. S. (2008). *Paediatric physical therapy*. pp56–59. Sigelman, C. K., and Rioer, E. A. (2003). *Lifespan human development*. pp138-139. Damon, W. and Lerner, R. M. (2003). *Handbook of child psychology*. pp193-196 480, 494. Wilk, R. and Haenn, N. (Ed.) (2006). *The environment in anthropology: a reader in ecology, culture and sustainable living*. pp147–148. Grunwald, M. [Ed.]. (2008). *Human haptic perception: basics and applications*. pp216, 493.
¹⁴⁰ Whittle, M. (2007). *Gait analysis*. pp89-90. Vogel, S. (2009) *Glimpses of creatures in their physical worlds*. p238.
¹⁴¹ Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. pp65-66.
¹⁴² Gibson, E. J., and Walk, R. D. (1960). *The visual cliff*. pp67–71. Stein, D. J., Hollander, E. and Olasov Rothbaum, B. (2009). *Textbook of anxiety disorders*. p531. Ornstein, R. E. and Ehrlich, P. R. (2000). *New world new mind: moving toward conscious evolution*. p20-21.
¹⁴³ Haehl, V., Vardaxis, V. and Ulrich, B. (2000). *Learning to cruise: Bernstein's theory applied to skill acquisition during infancy*. pp685-686.

¹⁴⁴ Whittle, M. (2007). *Gait analysis*. pp89-90. Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p10. Muybridge, E. and Taft, E. (1957). *The human figure in motion*. pp17, 93, 183. Cray, J. (2001). *Suspensions of perception. attention, spectacle and modern culture*. pp140-142. Goldstein, E. B. (2010). *Sensation and perception. eighth edition*. pp194, 418-419.
¹⁴⁵ Bergera, S.E. Theuring, C. and Adolph, K.E. (2007). *How and when infants learn to climb stairs*. pp36-37. Novaka, A. C. and Brouwer, B. (2010). *Sagittal and frontal lower limb joint moments during stair ascent and descent in young and older adults*. p54. Rosenbaum, D. A. (2009). *Walking down memory lane - where walkers looks as they descend stairs provides hints about how they control their walking behaviour*. pp425-430. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p63. Muybridge, E. and Taft, E. (1957). *The human figure in motion*. pp27, 29, 97, 99, 101, 105, 183, 187, 189. CIBSE. (2005). *Transportation systems in buildings, CIBSE guide D*, 3rd ed. p2-6.
¹⁴⁶ Saywell, N. (2010). *Age dependent differences in attenuation of vertical ground reaction force during a step descent*. p8. Chueca, P. (2008) *Staircases selection and detail*. p7. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p63. Riener, R., Rabuffetti, M. and Frigo C. (2001) *Stair ascent and descent at different inclinations*. pp32–44. Beaulieu, F. G. D., Pelland, L., Gordon, D. and Robertson, A. (2007). *Kinetic analysis of forwards and backwards stair descent*. p564.
¹⁴⁷ Templer, J. A., 1994, *The staircase: studies of hazards, falls, and safer design*, p8.
¹⁴⁸ CIBSE. (2005). *Transportation systems in buildings, CIBSE guide D*, 3rd ed. p2-6.
¹⁴⁹ Saywell, N. (2010). *Age dependent differences in attenuation of vertical ground reaction force during a step descent*. p8. Templer, J. A. (1994). *The staircase: history and theories*. p23.
¹⁵⁰ Allen, E. (2005). *How buildings work: the natural order of architecture*. pp166. Cook, P. (1967). *Architecture: action and plan*. p9. Lawson, B. (2001). *The language of space*. pp42-43. Ballantyne, A. (2002). *The Nest And The Pillar of Fire*. In Ballantyne, A. (Ed.), *What is architecture?* (p27). Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. pp56, 58-59, 61.

As psychologist Robert Ornstein and social scientist Paul Ehrlich note;

Habituation is built into our sensory neurons. It provides the basis for the mind's ability to ignore continuing phenomena and to seize instead upon short term incidents. Most vertebrate nervous systems are geared to "news": loosely speaking, their motto is "call me when something new happens"¹⁵¹.

1.1.7 No News Is Good News Or is it?

While our behaviour on stairs relates to a number of factors, much of the processing and response required is automatic - pre-attentive processing - our senses process incoming information and we respond automatically¹⁵². If we become aware that we are sharing the stair with others – the cat is walking downstairs as we are walking up - then our behaviour can become rule-based, for example we move automatically to one side. If this is not possible, then a rapid switch to an elevated level of heuristic processing allows us to consider even more rapidly, a variety of alternative actions, for example, to accept that the cat wishes to perform her customary ankle smooch greeting as we meet, pause to allow her to do so and proffer a pat in response, and then, greetings exchanged, step over her safely and carry on again¹⁵³.

This process begins with a 'conceptual scan', a sensory survey in which we scan our environment and note (to the best of our available perceptual skills) the fixed and variable factors within it¹⁵⁴. This enables us to map the stair and construct a cognitive model that we may use to understand, approach and traverse it¹⁵⁵. If sight is present a majority of information is received this way, so sight is generally the most significant sense with regard to mapping, directing and locomotion processes (especially via locomotor vision)¹⁵⁶.

However, vision is but one part of a wider operation; all our senses and perceptual systems (current thought is that we have as many as thirteen) are involved and act synchronously, including our kinaesthetic and proprioceptive senses that inform us of our body orientation and limb position in space¹⁵⁷. Although we have evolved such that our vision predominates, for those with severe visual impairments, the auditory-sensory and echoic memories may in fact be far more significant¹⁵⁸. These can inform a stair user of the number of people present, their proximity and movement, if they are approaching or departing, their gender, size and age, materials that are present, the size of the space in which they are situated¹⁵⁹. The haptic provides us with information about the floor, stair tread, handrail and wall surfaces, their textures, types of materials in use, temperature, dryness or humidity¹⁶⁰. Using taste and smell we can sample the air to detect human (or other) presence and proximity, substances or materials that we may encounter, cleanliness or dirt¹⁶¹. Proprioception and equilibrioception orient the body in space and in relation to other objects or people and maintain equilibrium¹⁶².

The thoroughness with which this scan is performed is related to and depends upon our expectations, which are then compared to the new mental 'map'. If there seems to be a mismatch somehow, then a greater degree of alertness is triggered. If the stair appears risky, then greater care will be invested in and expended on its negotiation. If it appears very dangerous, we may decide against using it entirely¹⁶³. The level of danger sensed and our expectations may also be dependent upon the environment within which the stair is situated. For example, a stair in a public environment may be very busy and we would expect that it

¹⁵¹ Ornstein, R. E. and Ehrlich, P. R. (2000). *New world new mind: moving toward conscious evolution*. pp80-81. See also Stewart, T. and Cohen, J. (1997). *Figments of reality: the evolution of the curious mind*. p171.

¹⁵² Goldstein, E. B. (2010). *Sensation and perception. eighth edition*. pp194, 418-419. Exner, U. and Pressel, D. (2009). *Spatial Design*.p10. Ornstein, R. E. and Ehrlich, P. R. (2000). *New world new mind: moving toward conscious evolution*. pp71-72. Blakemore, C. (2007). The Mind Machine. In Dawkins, R. (Ed.), *The Oxford book of modern science writing* (p88).

¹⁵³ Goldstein, E. B. (2010). *Sensation and perception. eighth edition*. pp109-110, 169, 177-179. Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p105.

¹⁵⁴ Goldstein, E. B. (2010). *Sensation and perception. eighth edition*. pp5-6, 159-160. Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p105. Urry, J. (2001). *Sociology beyond societies, mobilities for the twenty-first century*. pp80-81.

¹⁵⁵ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p238. Lynch, K. (1992). The image of the city. p3-4, 8-13. Hamela, K. A., Okita, N., Higginson, J. S. and Cavanagh, P. R. (2005). *Foot clearance during stair descent: effects of age and illumination*. pp135-136. Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. pp65-66, 105, 109.

¹⁵⁶ Noyes, J. (2001). *Designing for humans*. p27. Lawson, B. (2001). *The language of space*. p42. Ornstein, R. E. and Ehrlich, P. R. (2000). *New world new mind: moving toward conscious evolution*. pp21, 75.

¹⁵⁷ Noyes, J. (2001). *Designing for humans*. p27. Goldstein, E. B. (2010). *Sensation and perception. eighth edition*. pp5, 68, 158, 160, 306-307. Lackner, J. R. and DiZio P. (2005). *Vestibular, proprioceptive and haptic contributions to spatial orientation*. pp121, 124, 126-127. Clemens, I. A. H., De Vrijer, M., Selen, L.P.J., Van Gisbergen, J. A. M., and Medendorp, P. (2011). *Multisensory processing in spatial orientation: an inverse probabilistic approach*. pp5365-5367, 5373-5374. Urry, J. (2001). *Sociology beyond societies, mobilities for the twenty-first century*. p80. Lawson, B. (2001). *The language of space*. p42. Exner, U. and Pressel, D. (2009). *Spatial Design*.pp10, 12, 35. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p80.

¹⁵⁸ Ornstein, R. E. and Ehrlich, P. R. (2000). *New world new mind: moving toward conscious evolution*.p21. Goldstein, E. B. (2010). *Sensation and perception. eighth edition*. pp260, 267. Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p105.

¹⁵⁹ Goldstein, E. B. (2010). *Sensation and perception. eighth edition*. pp292-297, 340-343. Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. pp102, 105.

¹⁶⁰ Goldstein, E. B. (2010). *Sensation and perception. eighth edition*. pp338-339. Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p105. Exner, U. and Pressel, D. (2009). *Spatial Design*.p42. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p80. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p102.

¹⁶¹ Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p105. Exner, U. and Pressel, D. (2009). *Spatial Design*.p42. Goldstein, E. B. (2010). *Sensation and perception. eighth edition*. pp356-358.

¹⁶² Noyes, J. (2001). *Designing for humans*. p27. Lackner, J. R. and DiZio P. (2005). *Vestibular, proprioceptive and haptic contributions to spatial orientation*. pp117, 121, 124, 126-127. Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. pp65-66. Goldstein, E. B. (2010). *Sensation and perception. eighth edition*. pp158, 330. Exner, U. and Pressel, D. (2009). *Spatial Design*. p12.

¹⁶³ Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p105.

would be well maintained, and consequently be less wary of it, but an unfamiliar exterior step to the front door of a private residence may be examined far more cautiously¹⁶⁴. Residential stairs generally carry far less traffic than those in public buildings and are predominantly used by people who are familiar with and accustomed to them, but for a stranger, caution will generally apply. As Templer notes ‘we trust stairs within buildings unless there are some clues to the contrary’¹⁶⁵.

It is not just our stairs that we unconsciously trust, but typically, our senses, working in conjunction with our brain also, and expectations as to the infallibility of either can lead to problems for us¹⁶⁶. There are *many* factors that influence our sensory engagement and physical interactions with stairs. Our situational expectations and perceptions of danger may be influenced by such things as cultural moirés, personal experiences and fears, individual capabilities, age, and the presence (and number) or absence of other people and their demeanours¹⁶⁷. The greater alertness and heightened awareness that stairs require of us may be diminished by trip urgency (*I’m late! I’m late!*), sensory distractions (the allure of fresh coffee from the coffee cart), unexpected events (encountering a friend) or by physical and psychological factors such as fatigue (too many late nights), injury (too many rack squats), intoxication, (too many beers), impairment, illness or emotional state (a sprained ankle, the flu, the pent-up rage of a bad day or the lingering regret of angry words with a lover), or personal circumstances such as wearing too-high heels or being laden camel-like with baggage; any and all of which may cause us to fail to ‘scan’ (pay attention to) our environs as effectively as we otherwise might¹⁶⁸.

Because of this we might *then* fail to notice cues – anomalies or aberrations in the daily fabric of our accumulated experience - that would normally trigger warning alarms as posing a possible hazard, in other words, *news*; design issues such as a dimensional irregularity in an individual riser, a handrail that is poorly positioned, broken or even absent entirely, treads that are very narrow or risers that are unusually high, or conditional (maintenance) issues – litter (*another* banana skin? they should clean this place up) damage to a step tread (I must complain about that so they’ll fix it), obstructions (the cat) or the hint of a sheen that would usually suggest a suspiciously slippery step (she’s getting old)¹⁶⁹.

Our senses and brain are awe-inspiring for the virtuosity and rapidity with which they allow us to receive and compute vast and continuous streams of disparate data and process it into meaningful information to ensure our survival – for the most part unconsciously – but our expectations aside - they are not infallible, not insusceptible to error, whether it be due to a perceptual mis-read, a heuristic mis-calculation, a neurological mis-fire, sheer mischance or any other mis-take¹⁷⁰. Whatever the reason, we just didn’t catch - we *missed* - the *news*. There are a myriad complications that may challenge and trick perceptions, confound expectations and even defeat our sensory skills entirely, so that a normally obvious signal (the cat) does not register, the alarm (*take care!*) does not then ring and the Accident and Emergency department awaits (six weeks in traction, six *months* in physio), to our combined physiological and neurological mortification¹⁷¹. Sometimes all the legislation and great intent in the world cannot save us from the vagaries of our own neurons, and consequently, ill-fortune at the hands of our buildings in general and our stairs in particular. No news, is not *always* good news.

¹⁶⁴ Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. p52. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p121.

¹⁶⁵ Allen, E. (2005). *How buildings work: the natural order of architecture*. p165. Hatton, B. (2006). The Problem of Our Walls. In Madge, J. and Peckham, A. (Ed[s].), *Narrating architecture: a retrospective anthology* (p175). Cook, P. (1967). *Architecture: action and plan*. p9. Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p108.

¹⁶⁶ Exner, U. and Pressel, D. (2009). *Spatial Design*. p13.

¹⁶⁷ Herman, T., Inbar-Borovsky, N., Brozgol, M., Giladi, N. and Hausdorff, J. M. (2009) *The Dynamic Gait Index in healthy older adults: The role of stair climbing, fear of falling and gender*. pp239-240. CIBSE. (2005). *Transportation systems in buildings, CIBSE guide D*, 3rd ed. p2-3.

¹⁶⁸ Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. pp109-111, 135-153. Rosenbaum, D. A. (2009). *Walking down memory lane - where walkers look as they descend stairs provides hints about how they control their walking behaviour*. pp425-430.

¹⁶⁹ Ballantyne, A. (2002). The Nest and The Pillar of Fire. In Ballantyne, A. (Ed.), *What is architecture?* (p27). Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. pp109-111, 135-153. Rosenbaum, D. A. (2009). *Walking down memory lane - where walkers look as they descend stairs provides hints about how they control their walking behaviour*. pp425-430. Ballantyne, A. (2002). The Nest and The Pillar of Fire. In Ballantyne, A. (Ed.), *What is architecture?* (p27). Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p78.

¹⁷⁰ ‘mis-/mis/prefix:’. 2. Prefixed to nouns of action, condition, and quality in the sense ‘bad, wrong, faulty, perverse, misdirected’ 4. Prefixed to adjectives and derived adverbs with the sense ‘wrongly, erroneously, perversely’. *Shorter Oxford English dictionary, Sixth Edition*. p1802. Ballantyne, A. (2002). The Nest and The Pillar of Fire. In Ballantyne, A. (Ed.), *What is architecture?* (p27). Edelman, G. M. and Tononi, G. (2000). *A universe of consciousness: how matter becomes imagination*. pp47-49.

¹⁷¹ Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p15. Herman, T., Inbar-Borovsky, N., Brozgol, M., Giladi, N. and Hausdorff, J. M. (2009) *The Dynamic Gait Index in healthy older adults: The role of stair climbing, fear of falling and gender*. pp239-240. McNoe, B., Langley, J., Driscoll, T. and Feyer, A. (2005) *Work-related slip, trip and fall injuries in New Zealand*. pp1, 18, 22, 24, 28, 32, 43, 46. Kool, B., Ameratunga, S., Hazell, W. and Ng, A. (2010). *Unintentional falls at home among young and middle-aged New Zealanders resulting in hospital admission or death: context and characteristics*. pp1-2, 4-6. Allen, E. (2005). *How buildings work: the natural order of architecture*. p20.

1.1.8 Dangerous Spaces - Terrible Tales and High Crimes

Because we are injured most by what we do not expect, and because we must expect everything ("there is nothing which fortune does not dare"), we must, proposed Seneca, hold the possibility of disaster in mind at all times. No one should undertake a journey by car, or walk down the stairs, or say goodbye to a friend, without an awareness, which Seneca would have wished to be neither gruesome nor unnecessarily dramatic, of fatal possibilities¹⁷².

That the writer, Alain de Botton should choose to illustrate Seneca's thoughts on the means by which we may meet an unexpected end by including a fall down the stairs amongst them, seems entirely over-dramatic, especially when juxtaposed with the risky nature of cars, which after all, hold all too obvious dangers. Death by car crash? Yes - entirely believable - we read about it every day in the paper. But death by stairs? Surely not? Not *stairs*; something so familiar to us, so ubiquitous, so within our control, above all, so ridiculously *ordinary*. It seems absurd, fantastic. And yet, plenty of people do die after falls on stairs, a fact of which on some level we are definitely aware, even if only through the pages of homicide detective novels in which death by stair (whether opportunistic or planned) becomes the favoured modus operandi (Did she fall? Or was she pushed?) of the criminally inclined for its sheer likelihood¹⁷³. We would generally however, as with most plausible threats to our wellbeing and safety, rather not be reminded of this fact¹⁷⁴.

¹⁷² de Botton, A. (2001). *Consolations of philosophy*. p87.

¹⁷³ Smith, Thorne (1962) *Did she fall?* and Miles Disney, D. (1959). *Did she fall? Or was she pushed?* Madea, B. Dettmeyer, R. and Musshoff, F. (2008). *Falls downstairs: accident, homicide or natural death?* pp122-123, 128. Wyatta, J. P., Beard, D. and Busuttil, A. (1999). *Fatal falls down stairs*. pp31-33. Scott, A. (2005). *Falls on stairways – literature review*. pp7, 11, 18, 20. Kool, B., Ameratunga, S., Hazell, W. and Ng, A. (2010). *Unintentional falls at home among young and middle-aged New Zealanders resulting in hospital admission or death: context and characteristics*. pp1-2, 6. Thierauf, A. Preuss, J., Lignitz, E. and Burkhard, M. (2010). *Retrospective analysis of fatal falls*. pp92-94. Zierka, D., Johannsen, L. and Hollands, M. (2011). *Stepping characteristics and centre of mass control during stair descent: effects of age, fall risk and visual factors*. p1. McNoe, B., Langley, J., Driscoll, T. and Feyer, A. (2005) *Work-related slip, trip and fall injuries in New Zealand*. pp1-28. Reevesa, N. D., Spanjaarda, M., Mohagheghia, A.A, Baltzopoulos, V. and Maganarisa C. N. (2006). *The demands of stair descent relative to maximum capacities in elderly and young adults*. pp218-227. Hermana, T. Inbar-Borovskya, N. Brozolgolga, M. Giladia, N. and Hausdorffa, J. M. (2009). *The dynamic gait index in healthy older adults: the role of stair climbing, fear of falling and gender*. pp237-240. Cluffa, T. and Robertson, D. G. E. (2011). *Kinetic analysis of stair descent: Part 1. Forwards step-over-step descent*. pp423-428. Reida, S., Grahama, R.B and Costigana, P. (2010). *Differentiation of young and older adult stair climbing gait using principal component analysis*. pp197-203. Muhaidata, J., Kerr, A., Raffertya, D. Skeltona, D.A. and Evans, J.J (2011). *Measuring foot placement and clearance during stair descent*. pp504-506. Templer, J.A. (1992). *The staircase: histories and theories*. pix. Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. pp3-4. Conora, J., Langley, J. and Cryer, C. (2007). *International comparisons of injury*. pp14-18. Wyatta, J. P., Beard, D. and Busuttil, A. (1999). *Fatal falls down stairs*. p33.

¹⁷⁴ Botton, de. A. (2001). *Consolations of philosophy*. p87.

As a consequence, our relationship with the stair is characterised (like that of our relationship with heights in general as will be discussed), by a similarly uncomfortable awareness that even while we prize the advantages we gain from it, the stair may hide all manner of unexpected malevolencies¹⁷⁵.

This deadly potential is also well illustrated by the Edward Gorey's abecedarian parody, *The Gashlycrumb Tinies*, a pseudo Victorian-Gothic tale of comic horror in which the reader encounters twenty-six children engaged in an assortment of potentially risky pastimes that after going invariably and horribly wrong, result in their untimely demises¹⁷⁶. These variously unpleasant expirations include death by leech (Fanny), fire (Rhoda), ice (Winnie), fits (Susan), axe-strike (Kate), thuggery (Hector), trampling (Prue) and bears (Basil). Out of this litany of disasters comprising elemental hazards, natural chaos, wild animals, mechanised misfortunes and incautiously innocent curiosity, only one is architecturally inclined; however, it just so happens to occur on the very first page of all, and is reserved for the unlucky Amy who *fell down the stairs*¹⁷⁷.

A is for Amy who fell down the stairs

Figure 16: A is for Amy and architectural awfulness death by stair

¹⁷⁵ Allen, E. (2005). *How buildings work: the natural order of architecture*. p20. Hermana, T. Inbar-Borovskya, N. Brozolgolga, M. Giladia, N. and Hausdorffa, J. M. (2009). *The dynamic gait index in healthy older adults: the role of stair climbing, fear of falling and gender*. pp237-240. New Zealand's Accident Compensation Corporation (ACC) records the number of reported accidents involving stairs that occur every year in New Zealand; 31, 720 in 2009, 610 a week, eighty-seven every day; see <http://www.acc.co.nz/news/WPC088465>

¹⁷⁶ Gorey, E. (1997). *The gashlycrumb tinies*. Houghton Mifflin Harcourt.

¹⁷⁷ Gorey, E. (1997). *The gashlycrumb tinies*. Houghton Mifflin Harcourt.

That of all possible architectural accidents - toppling chimneys, rotting roofs, collapsing floors, insecure windows, unstable walls, un-balustraded balconies (and that staple of dramatic and comedic scenographies, precarious chandeliers), *stairs* have been selected by Gorey to be the aberrant element is, like de Botton's example, an unnerving demonstration of the suspicion and fear with which we regard them¹⁷⁸. In poor Amy's case, without even reading the text our suspicion as to potentially deadly nature of her encounter with the stair is aroused by the gloomily monotone vista of the scene before us, and as we happen upon Amy, alone, frozen in the moment of her descent between post-trip stumble and pre-doom crash, we are forced to watch, helpless to intervene, her inevitable fate. The tension is heightened by the shadowy, monotone, Victorian gloom; it is all too easy to imagine the timorous footsteps echoing in the dark wooden hall, the ominous creak of the dusty stair, the musty odour of damp joylessness, the frigidity of oppressive unwelcome and the tiny cry of despair as Amy mis-steps and tumbles to her architecturally effected doom¹⁷⁹. Actually, it is not even evident *what* the cause of this misfortune is; whether it is by mis-step, a result of Amy's own careless inattention, or due to some random neurological misfire - a sensory synapse-lapse that causes perceptual misjudgement - or if it is neither of these but some malicious, 'secret deceit' of the stair - a rebellious riser, of maverickly unique dimension to disrupt the usual constancy that we expect, or an uneven or too-smooth tread¹⁸⁰. But that it might be this last somehow makes matters even worse – the stair exists at our behest - surely we can prevent at least this calamity through careful measurement and the diligent mastery of geometry? The awfulness of this miserable misadventure is further heightened by the scale and manner of the stairs down which tiny Amy is shown tumbling; although broad, and possessing capacious treads and gentle risers, in light of Amy's diminutive size, they appear not benign, comforting and friendly but mocking, taunting; *treacherous*¹⁸¹. In comparison to her childish form the smooth handrail that sits atop the smugly fat, perfectly ordered but *adult sized* balusters would be too high for

her to reach and grasp successfully; she could not seize it and prevent her headlong descent. That this spitefully unhelpful scaling could thwart a final, last second attempt at self-rescue, is the stair's ultimate act of treachery, but in all aspects of Amy's dreadful demise on the stair however, it is evident that mischief, is literally, afoot¹⁸².

That death by architecture is regarded as sufficiently frightful to be included in this alphabetised compendium of horrors is a good illustration of both our fearful ambivalence toward the stair in particular and our unconscious and paradoxical expectations of our buildings in general, namely, that even if our buildings are not always as helpful to us as we would wish, we believe that at the very least, neither they in their entirety, nor any of their parts singularly - including stairs - should hinder us¹⁸³. In good Hippocratic fashion, they should *at least* 'do no harm'¹⁸⁴. (It is worth noting that our expectations as to this are firmly entrenched in our language – we speak of constructing a sound argument, our relationships as being on firm foundations, a poor argument as being on shaky ground – the list goes on.) By extension, 'Architecture', we believe can and should go further that this to actively do good and *prevent* harm, because of the ethical imperative with which it is inextricably entwined, upon which it is *founded*, that demands the provision of firmness, usefulness and *beauty*¹⁸⁵. zz

¹⁷⁸ Herman, T., Inbar-Borovsky, N., Brozgol, M., Giladi, N. and Hausdorff, J. M. (2009). *The Dynamic Gait Index in healthy older adults: The role of stair climbing, fear of falling and gender*. pp239-240. Saywell, N. (2010). *Age dependent differences in attenuation of vertical ground reaction force during a step descent*, pp8, 33-34. Reeves, N. D., Spanjaarda, M., Mohagheghia, A.A, Baltzopoulos, V. and Maganarisa C. N. (2006). *The demands of stair descent relative to maximum capacities in elderly and young adults*. pp218-227.

¹⁷⁹ Kennedy, V. (1993). *Mystery! unravelling Edward Gorey's tangled web of visual metaphor*. pp181-183. Hamela, K. A., Okita, N., Higginson, J. S. and Cavanagh, P. R. (2005). *Foot clearance during stair descent: effects of age and illumination*. pp135-140. Den Ottera, A. R., Hoogwerf, M. and Van Der Woude, (2011, in press). *The role of tread fixations in the visual control of stair walking*. pp1-2, 4. Shortleeve, K. (2002) *Edward Gorey: children's literature and nonsense verse*. p29. Smith, T. (1884). *Architecture: gothic and Renaissance*. pp155-156. Shortleeve, K. (2002). *Edward Gorey, children's literature, and nonsense verse*. pp.27-39.

¹⁸⁰ Templar, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. pix.

¹⁸¹ Kennedy, V. (1993). *Mystery! unravelling Edward Gorey's tangled web of visual metaphor*. pp182-183. Bodmer, G. R. (1989). *The post-modern alphabet: extending the limits of the contemporary alphabet book, from Seuss to Gorey*. pp. 115-117.

¹⁸² Shakespeare, W (2004). *Julius Caesar: side by side*. p128. (Anthony: act iii, scene ii)

¹⁸³ Hatton, B. (2006). *The Problem of Our Walls*. In Madge, J. and Peckham, A. (Ed[s.]), *Narrating architecture: a retrospective anthology* (p175). Goldberger, P. (2009). *Why architecture matters*. p47. Sagan, C. (2007). *The demon haunted world*. In Dawkins, R. (Ed.), *The Oxford book of modern science writing* (p242). Ellin, N. (2003). *Fear and city building*. In Madge, J. and Peckham, A. (Ed[s.]), *Narrating architecture: a retrospective anthology*. (pp44-46, 48, 53-56, 59-61). Verschaffel, B. (2006). *The meanings of domesticity*. In Madge, J. and Peckham, A. (Ed[s.]), *Narrating architecture: a retrospective anthology*. (p244). Ballantyne, A. (2002). *The Nest And The Pillar of Fire*. In Ballantyne, A. (Ed.), *What is architecture?* (p12). See also above, footnote 179. Allsop, B. (1974). *Towards a humane architecture*. p58. Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. pp151, 153-154. Harries, K. (2000). *The ethical function of architecture*. p23. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. p3. Knowles, M. and Moon, R. (2006). *Introducing metaphor*. pp30, 32, 67, 103, 108, 113, 115, 120. Kövecses, Z., Benczes, R., Bokor, Z., Csábi, S., Lazanyi, O. and Nucz, E. (2010). *Metaphor: a practical introduction*. pp138-140.

¹⁸⁴ Kövecses, Z., Benczes, R., Bokor, Z., Csábi, S., Lazanyi, O. and Nucz, E. (2010). *Metaphor: a practical introduction*. pp4, 6, 13, 19, 25, 35, 64, 92-93, 95-96, 121, 132, 136, 144, 150, 159, 276. Boardman, J., Griffin, J. and Murray, O. (1986). *The Oxford history of the classical world*. p230. Blackburn, S. (2005). *The Oxford dictionary of philosophy*. p167. Tszold, T. (2005). *The Changing Regulatory Template*. In Ben-Joseph, E. and Szold, T.S. (Ed[s.]), *Regulating place: standards and the shaping of urban America*. (p360).

¹⁸⁵ Kostof, S. (1995). *A history of architecture: settings and rituals*. pp12-13. Goldberger, P. (2009). *Why architecture matters*. pp6-7, 8, 26, 39, 42. Cook, P. (1967). *Architecture: action and plan*. p10. Allen, E. (2005). *How buildings work: the natural order of architecture*. p23. Allsop, B. (1974). *Towards a humane architecture*. p8. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p3, 11. Quantrill, M. (1974). *Ritual and response in architecture*. p102. Ballantyne, A. (2002). *The Nest and The Pillar of Fire*. In Ballantyne, A. (Ed.), *What is architecture?* (p15). Fisher, T. R. (2000). *In the scheme of things: alternative thinking on the practice of architecture*. p1238. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. pp4, 6, 8. de Botton, A. (2006) *The architecture of happiness*. pp72-73, 173-174, 180, 183. Coles, J. and House, N. (2007). *The fundamentals of interior architecture*. p64. Allsop, B. (1974). *Towards a humane architecture*. pp18-19, 76, 93. Hagan, S. (2001). *Taking shape: a new contract between architecture and nature*. p11. Platt, C. (2005). *The inhabited perimeter and the inclusive room*. p214.

And there is little beautiful about the prospect of receiving harm as a consequence of building inhabitation. (We may feel differently about harm if the circumstances and recipients are different, but in this context most of us would probably rather not receive broken limbs, cracked heads, bleeding wounds and wheezing lungs as a result of our encounters with architecture in general and our stairs in particular.¹⁸⁶) Aside from any moral imperative however, it is practically desirable that our buildings not cause us harm, if only from the pragmatic perspective that accidents and injuries are an expense to any health system and therefore taxpayers; the more that can be avoided, the better off, physically and financially, we will all be.¹⁸⁷ But the codification of this practical reality, and consequently its legal enforceability, is not based upon, as is commonly thought, any ‘architectural’ ethos, a spirit of excellence, a desire to *maximise* human comfort and safety and promote happiness, well-being and contentment, but upon instead, a minimum standard of performance, to ensure merely reasonable functionality and therefore *adequate* comfort and safety.¹⁸⁸ As a result we currently inhabit an *unhappy* paradox of our own making whereby we expect our architecture and therefore our stairs, to be somewhat more helpful and much *less* harmful to us than they frequently are. In short, the delivery of our actual built environment – our *supposed-to-be-architecture* - in general, does not match our expectations, even though we are responsible for both.¹⁸⁹

¹⁸⁶ Allen, E. (2005). *How buildings work: the natural order of architecture*. p10. Beaulieu, F. G. D., Pelland, L., Gordon, D. and Robertson, A. (2007). *Kinetic analysis of forwards and backwards stair descent*. p564. Berger, S.E. Theuring, C. and Adolph, K.E. (2007). *How and when infants learn to climb stairs*. p36. Riener, R., Rabuffetti, M. and Frigo C. (2002). *Stair ascent and descent at different inclinations*. pp32–44. Novaka, A. C. and Brouwer, B. (2010). *Sagittal and frontal lower limb joint moments during stair ascent and descent in young and older adults*. p54. Beaulieu, F. G. D., Pelland, L., Gordon, D. and Robertson, A. (2007). Saywell, N. (2010). *Age dependent differences in attenuation of vertical ground reaction force during a step descent*, pp8, 33-34.

¹⁸⁷ Thierauf, A. Preuss, J., Lignitz, E. and Burkhard, M. (2010). *Retrospective analysis of fatal falls*. pp92-94.

¹⁸⁸ Scott, A. (2005). *Falls on stairways – literature review*. p10. Till, J. (2009). *Architecture depends*. pp180-182. Botton, de. A. (2006) *The architecture of happiness*. p13. Hagan, S. (2001). *Taking shape: a new contract between architecture and nature*. p11.

¹⁸⁹ Leaman, A. and Bordass, B. (undated). *Keep occupants “satisfied”*. pp22-24, 26-27. Leaman, A. and Bordass, B. (2007). *Are users more tolerant of ‘green’ buildings?* pp662-664, 671-672. Inalhan, G. (2009). *Attachments: the unrecognised link between employees and their workplace (in change management projects)*. pp17-18, 20. Leaman, A. (2001). *What Occupants Want. In Getting better value from your buildings*. pp1-4. (online) Bordass, B. and Bromley, K. and Leaman, A. (1993). *User and occupant controls in office buildings*. p11. Leaman, A. (2009). *The great escape*. pp18-20. Leaman, A. and Bordass, B. (1996). *Buildings in the Age of Paradox*. In Leaman A. (Ed.) *Buildings in the age of paradox*. (pp6-7). Leaman, A. and Bordass, B. (2005). *Productivity in buildings: the killer variables*. (online.) Leaman, A. (undated). *Usability in buildings: the Cinderella subject*. (online.) Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp82, 89. Till, J. (2009). *Architecture depends*. pp125-126, 184. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. pp1, 3, 5, 77. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. pp3, 5, 200-201. Botton, de. A. (2006) *The architecture of happiness*. pp13, 106-107, 248-249. Allsop, B. (1974). *Towards a humane architecture*. pp42-43, 56-57, 76-77, 85-86, 94-98.

But this selection of the stair by both de Botton and Gorey as the particular agent of doom within the gamut of architecture is shocking to us, even while painfully predictable. Predictable because we know, even if we try to forget, that the stair *can* be deadly to us, more so that many of the things for which we commonly hold fears and some of which we are considerably less likely to encounter than stairs – snakes, tigers, tarantulas – (admittedly situationally dependent examples), or can at least more easily avoid - the dentist, clowns and peanut butter - and shocking because usefulness is the essential reason for the stair to exist¹⁹⁰. If a stair cannot safely fulfil its originating function – the provision of vertical travel – and is unusable because it is deadly to us, then what reason does it have to be? More to the point, it should *not* be¹⁹¹. The inescapable truth then is that we truly *are* the architects of our own misfortunes, it is our own disinclination to perfect the stair and legislatively enforce its immaculate conception that is our collective downfall, and thus that of Amy. But indolence is merely a convenient refuge in the face of what is the actually inescapable and highly unwelcome truth, which is that we know, despite our best efforts, despite all our study, some degree of legislation, and a great practical need to do so, we can never truly tame the stair’s conception, perfect its execution or master its presence. Even while our intellect has aided our devising of them, our weaknesses mean that devising is and never can be, perfect, nor will their implementation be. We are ‘only human’, and therefore our creations are as imperfect and susceptible to error as we are, as is our subsequent use of them also¹⁹². Our intellectual imperfections therefore doom us to a depressing combination of constant physical risk and the sadly perpetual disappointment that is the only possible outcome of unrealistic expectation¹⁹³.

¹⁹⁰ Pinker, S. (2007). The Language Instinct. In Dawkins, R. (Ed.), *The Oxford book of modern science writing* (p105.). Barlow, D. H and Durand, V. M. (2008). *Abnormal psychology: an integrative approach*. p144. Stein, D. J., Hollander, E. and Olasov Rothbaum, B. (2009). *Textbook of anxiety disorders*. pp63, 142, 437, 525, 535-534. Ronald, M., Kahn, A. P., and Marks, I. M. (foreword). (2000). *The encyclopaedia of phobias, fears, and anxieties: second edition*. ppixii, 61, 159, 264, 458-460. Specifically; ‘arachnophobia’: A fear that peanut butter will stick to the roof of one’s mouth’, p61; ‘coulrophobia: Fear of clowns’, p159; ‘dental anxiety’ or ‘dentophobia’: ‘fear of dentists or dentistry’, pp176-180; ‘arachnophobia’: ‘A phobic preoccupation or fear of spiders’ p458; ‘ophidiophobia’ or ‘herptophobia’: ‘Fear of snakes’, p453; ‘aelurophobia’ or ‘galeophobia’, or ‘gatophobia’, or ‘felinophobia’: Fear of cats’, pp121-122.

¹⁹¹ Either morally, and if that is not impetus enough, legally, as documented in our building code: Department of Building and Housing. (2005). *Clause D1 - Access routes*. pp18, 27-34, 39-41. Harries, K. (2000). *The ethical function of architecture*. p23.

¹⁹² Scott, A. (2005). *Falls on stairways – literature review*. p10. Till, J. (2009). *Architecture depends*. p83.

¹⁹³ de Botton, A. (2001). *Consolations of philosophy*. pp80-82.

The shock that occurs whenever we are reminded of this conundrum is demonstrated in the Gashlycrumb Tinies by the fact that if Amy's misadventurous stair encounter were not bad enough, there is *worse to follow*. Her demise is succeeded immediately by that of Basil, from more overtly and brutal mass attack by bears ('B is for Basil, assaulted by bears')¹⁹⁴. But the unfortunate Basil succumbed to his death through *lack* of architectural protection (shelter) against a known, untameable, danger, as we might at least expect, whilst Amy succumbed to hers *within and because of it* – because of *a stair!* - which we would much rather *not*¹⁹⁵.

1.1.9 Building Barriers: An Architecture of Kryptonite?

Urban Dictionary: "Stairs: Wheelchair kryptonite."
 Person: "Hey, let's go down these stairs"
 Wheelchair Person: "NOOOOOOOOOOOO!"¹⁹⁶

Figure 17: Design fail

The terminal consequences of encounters with dangerously delinquent stairs or an absence of adequate shelter are not the only careless unkindnesses that architecture can bestow upon us. However insensitive the above definition from the web-based, user-defined dictionary urbandictionary.com, and the sign beneath it, they are a rather mortifying reminder of the truth that for some of us, the use of stairs to achieve access or surmount elevation – and safely – is more of a challenge than for others, and it may actually be impossible¹⁹⁷. The use of a stair is *not* necessarily an easy matter¹⁹⁸. There are many impairments from which humans may suffer and in New Zealand, approximately 660,300 people experience disability in some way¹⁹⁹. These disabilities typically include sensory impairment involving vision, hearing and haptics, loss of mobility, intellectual capacity and physiological capability and a vast range of other physical, emotional, sensory and perceptory and psychiatric incapacities that can prevent sufferers from performing and participating in 'everyday' activities²⁰⁰. Many countries endeavour to ensure that those who suffer disabilities enjoy equal access to public buildings and cityscapes as those who are able bodied, equally, many do not²⁰¹. The World Health Organisation notes that in many developing nations, accessible travel and access in general (to and within buildings and about the wider built environment) may vary from awkward to difficult to completely impossible, as no legal entitlement to such provision may exist, or if it does may not be enforced in any case²⁰². Typically, in westernised countries such as those of Europe, North America and Australasia, the right of the disabled to gain access to public buildings to the same level as that enjoyed by the able-bodied, is encoded in law, although the

¹⁹⁴ Gorey, E. (1997). *The gashlycrumb tinies*. Houghton Mifflin Harcourt.

¹⁹⁵ Gorey, E. (1997). *The gashlycrumb tinies*. Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. pp135-136. Allsop, B. (1974). *Towards a humane architecture*. p58. Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. pp151, 153-154. Harries, K. (2000). *The ethical function of architecture*. p23. Goldberger, P. (2009). *Why architecture matters*. p47. Sagan, C. (2007). The demon haunted world. In Dawkins, R. (Ed.), *The Oxford book of modern science writing* (p242). Allen, E. (2005). *How buildings work: the natural order of architecture*. pp166. Cook, P. (1967). *Architecture: action and plan*. p9. Lawson, B. (2001). *The language of space*. pp42-43. Ballantyne, A. (2002). The Nest And The Pillar of Fire. In Ballantyne, A. (Ed.), *What is architecture?* (p27). de Botton, A. (2001). *Consolations of philosophy*. p87.

¹⁹⁶ 'Stairs' Urban Dictionary 136 up, 12 down. (Online). May 14 2006 <http://www.urbandictionary.com/define.php?term=stairs>

¹⁹⁷ Scott, A. (2005). *Falls on stairways – literature review*. p25. Bergera, S.E. Theuring, C. and Adolph, K.E. (2007). *How and when infants learn to climb stairs*. p47. World Health Organisation. (2011). *World report on disability 2011*. pp168, 180, 182, 204, 215, 289.

¹⁹⁸ Allen, E. (2005). *How buildings work: the natural order of architecture*. p10. Beaulieu, F. G. D., Pelland, L., Gordon, D. and Robertson, A. (2007). *Kinetic analysis of forwards and backwards stair descent*. p564. Bergera, S.E. Theuring, C. and Adolph, K.E. (2007). *How and when infants learn to climb stairs*. p36. Riener, R., Rabuffetti, M. and Frigo C. (2002). *Stair ascent and descent at different inclinations*. pp32–44. Novaka, A. C. and Brouwer, B. (2010). *Sagittal and frontal lower limb joint moments during stair ascent and descent in young and older adults*. p54. Beaulieu, F. G. D., Pelland, L., Gordon, D. and Robertson, A. (2007). Saywell, N. (2010). *Age dependent differences in attenuation of vertical ground reaction force during a step descent*, pp8, 33-34. Vogel, S. (2009). Glimpses of creatures in their physical worlds. pp122–123. Coles, J. and House, N. (2007). *The fundamentals of interior architecture*. p41.

¹⁹⁹ World Health Organisation. (2011). *World report on disability 2011*. p297. World Health Organisation. *International classification of functioning, disability and health (ICF)*. Database; available online.

<http://apps.who.int/classifications/icfbrowser/> Imrie, R. (1996). *Disability and the city: international perspectives*. pp27-29, 176. Statistics New Zealand. (2007). *2006 disability survey*. p2. World Health Organisation. (2011). *World report on disability 2011*. pp271-276.

²⁰⁰ Statistics New Zealand. (2007). 2006 disability survey. pp16-18. Department of Building and Housing. (2005). *Clause D1 - Access routes*. p13.

²⁰¹ Imrie, R. (1996). *Disability and the city: international perspectives*. pp25, 51-52, 53, 58 176.

²⁰² World Health Organisation. (2011). *World report on disability 2011*. pp40, 42, 139, 169-170, 172-177, 262. International Council for Research and Innovation in Building and Construction. (2004). *CIB W084 Building Comfortable Environments for All Report December 2004*. p4. Allen, E. (2005). *How buildings work: the natural order of architecture*. p167. United Nations Human Settlements Programme. (2007). *Enhancing urban safety and security: global report on human settlements 2007*. p207.

extent to which this is enforced may still vary²⁰³. In New Zealand, approximately seventeen percent of the population experiences one or more disabilities at any time, the most common of which are physical and sensory, and any of which can leave a sufferer unable to climb a flight of stairs²⁰⁴. Increasing efforts are being directed at ensuring that all public buildings are accessible²⁰⁵.

Whilst this is entirely laudable and long overdue, the inquiry into the terrorist attacks on the World Trade Centre revealed an increasing problem with regard to *egress*, however²⁰⁶. The investigation found that six per cent of occupants / survivors reported the need for assistance in travelling downstairs as they exited the buildings²⁰⁷. Accessibility regulation has now enabled many more of us who experience impairments, of varying kinds, durations and to varying degrees, to *access* multi-story buildings unassisted, but the same means by which we may access and *exit* under normal circumstances – typically an elevator – is often deliberately prevented from being operational in an emergency situation²⁰⁸. When an alarm is triggered, modern safety systems are usually programmed to automatically return elevators to a designated floor, to both prevent people from attempting to exit in them (and so risk becoming trapped) and or / in some circumstances to enable their use for emergency rapid access by fire fighters²⁰⁹. Such situations, highlighted by the egress experiences of survivors of the World Trade Centre attacks have led to an increase in research regarding the use of protected elevators in some buildings / circumstances (especially over certain heights) and

the adoption in some countries, including Hong-Kong, of refuge floors²¹⁰. Providing access to buildings then is only one half of the problem – providing egress – the ability to leave, and safely, is the other, especially for those suffering from impairments that make this difficult²¹¹. And if the stair is no longer practical for the latter as well as the former, and alternatives are available, what reason is there to continue to include stairs in our high rise buildings?

Figure 18: A stair lift

Figure 19: The ibot stairclimber uses gyroscopes to navigate stairs, giving mobility impaired users greater independence and freedom if they can afford it.

Figure 20: The Martin Jetpack, every child's science fiction dream is now becoming a commercial reality.

Circumventing stairs and height can be done, by using means other than elevators, but often only at great expense

²⁰³ Council for Research and Innovation in Building and Construction. (2004). *CIB W084 Building Comfortable Environments for All Report December 2004*. p4. CIBSE. (2005). *Transportation systems in buildings, CIBSE guide D*, 3rd ed. pp11-3-11.5.

²⁰⁴ Statistics New Zealand. (1998). *New Zealand now – 65 plus (census 96)*. pp63-64, 67. Statistics New Zealand. (2007). *2006 disability survey*. p2. State Services Commission. (2008). *Enabling ability: meeting the employment requirements of people with disabilities in the public service*. p4. Ministry of Health. (2004). *Living with disability in New Zealand*. (online).

²⁰⁵ Department of Building and Housing. (2005). *Clause D1 - Access routes*. pp17, 19, 46. Litmus Ltd. (2008). *New Zealand disability strategy implementation review 2001-2007*. pp16, 19, 22, 30, 57, 62, 81. Department of Building and Housing. (2007). *Building for the 21st century report on the review of the building code*. 6, 10, 14, 16-17, 18, 24, 30, 37, 39, 45-46, 49, 56, 63, 64, 76. New Zealand Government. (2011). *Building act 2004: public act no. 72. sections 117-120 access to buildings by persons with disabilities*. pp114-116. Department of Building and Housing New Zealand. (2008). *Disability strategy implementation 2007 work plan 2007-2008 and report on progress 2006-2007*. pp3, 5, 29. International Council for Research and Innovation in Building and Construction. (2004). *CIB W084 Building Comfortable Environments for All Report December 2004*. pp12-13. Blanc. A. and Blanc, S. (2001). *Stairs, second edition*. pp167-172, 195, 198. See also; Standards New Zealand. (2001). *NZS 4121: 2001 Design for access and mobility: buildings and associated facilities. Chapter 8: Stairs*. CIBSE. (2005). *Transportation systems in buildings, CIBSE guide D*, 3rd ed. pp5-28, 5-30.

²⁰⁶ Strakosch, G. and Caporale, R. S. (2010). *The vertical transportation handbook*. pp496, 566.

²⁰⁷ Bukowski, R. W. (2009). *Emergency egress from buildings. part 1: history and current regulations for egress systems design*. pp181, 184.

²⁰⁸ Bukowski, R. W. (2009). *Emergency egress from buildings. part 1: history and current regulations for egress systems design*. pp185-186. Strakosch, G. and Caporale, R. S. (2010). *The vertical transportation handbook*. pp42, 129, 169-170. CIBSE. (2005). *Transportation systems in buildings, CIBSE guide D*, 3rd ed. pp6-3-6-8, 11-10.

²⁰⁹ Strakosch, G. and Caporale, R. S. (2010). *The vertical transportation handbook*. pp129, 169, 496.

²¹⁰ Bukowski, R. W. (2009). *Emergency egress from buildings. part 1: history and current regulations for egress systems design*. pp177, 181-182, 184-185, 187. Strakosch, G. and Caporale, R. S. (2010). *The vertical transportation handbook*. pp129, 340, 496.

²¹¹ CIBSE. (2005). *Transportation systems in buildings, CIBSE guide D*, 3rd ed. pp6-3-6-4, 6-6, 6-9-6.10, 11-9-11.10.

1.1.10 Folly, Flight and Falling Felines: Uneasy Heights, an Intricate Relationship

Figure 21: Da Vinci's Wings

It's a love

History is littered with the determinedly enthusiastic attempts of humanity to emulate birds and conquer height²¹². Notwithstanding eventual triumph, some of these earlier efforts were characterised by rather more optimism than skill, and thus experienced varying degrees of success (if by success the flyer is required to both achieve flight and remain alive / uninjured, then some were definitely more successful than others²¹³.) Despite such heroic but tragically misguided enterprises as that of the polymath Abbas Ibn Firnas (810-887 CE) who, modelling his efforts upon birds supplied himself wings (but unfortunately neglected to note that they also possess tails), the ill-timed expedition of Zviedris Johanson who, legend has it, successfully flew by dint of home-made wings from his township's church steeple but did so in the seventeenth century (and was subsequently burned at the stake by the church for it), William Paul Butusov and his rather gloriously named Soaring Machine (which did anything but, it remained stubbornly stuck to its launch), and the valiant but misguided efforts of Israel

Ludlow (who when his Ludlow Aeroplane 'cracked up' into a river, sadly did likewise and was consequently paralysed as a result) - to mention just a few - the desire to conquer the vertical has proved extremely hard to resist²¹⁴. We yearn *for* height; we yearn to *conquer* height²¹⁵.

Figure 22: Israel Ludlow and his Ludlow Aeroplane, built in an era when enthusiasm for flight seriously outweighed knowledge of aerodynamics. It did eventually fly. Just not for very long. Or very far.

²¹² Harris, J. S. (1989). *An airplane is not a bird*. pp18-22. Alexander, D. E. (2009). *Why don't jumbo jets flap their wings? Flying animals, flying machines and how they are different*. p1. Singer, B. (2009). *Like sex with gods, an unorthodox history of flying*. pp3-4. Henderson, C. L. and Adams, S. (2008). *Birds in flight: the art and science of how birds fly [hardcover]*. pp15, 109 117-118.

²¹³ See also the following books, now out of print but still available from some booksellers, for comprehensive histories; Michael, J. F. (1980). *Incredible flying machines: an anthology of eccentric aircraft*. Haining, P. (1976). *The compleat birdman: an illustrated history of man-powered flight*. Niccoli, R. (2007). *History of flight (from technique to adventure)*.

²¹⁴ Vernet J. (2008). Abbas Ibn Firnas in *Complete Dictionary of Scientific Biography*. Vol. 1. p5. As a result of which he unfortunately sustained sufficiently severe injuries that although he did not perish immediately he eventually succumbed some two months later. Singer, B. (2003). *Like sex with gods: an unorthodox history of flying*. p103. Apparently this was either for his temerity in daring to emulate God, or, for (the only other possible and preferred explanation at the time), being a witch. Fortunately it is now (generally) acceptable for us to board a Boeing 747 without fear of the same fate. Sagan, C. (2007). The demon haunted world. In Dawkins, R. (Ed.), *The Oxford book of modern science writing* (p240). Behringer, W. (1998). Witchcraft Studies in Austria, Germany and Switzerland. In *Witchcraft in early modern Europe: studies in culture and belief*. Barry J., Hester, M. and Roberts, G. (pp79-81). Behringer, W. (2004) *Witches and witch-hunts: a global history*. pp2-3, 29, 59, 230. Oldridge, D. (2002). *The witchcraft reader*. pp130,131, 135. New York Times. (1906). *Injured aeronaut here; Ludlow, who fell from his aeroplane, paralyzed below the waist*. (available online). Hallion, R. P. (2003). *Taking flight: inventing the aerial age from antiquity through the first world war*. p11.

²¹⁵ Vogel, S. (2009). Glimpses of creatures in their physical worlds. p95. Singer, B. (2009). *Like sex with gods, an unorthodox history of flying*. p3. Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. p54. Ouellette J. (2006). *Black bodies and quantum cats: tales of pure genius and mad science*. pp79-80. Strakosch, G. and Caporale, R. S. (2010). *The vertical transportation handbook*. pp327-328,565.

.... hate

Despite this romantic and long standing lure of the heavens however, humans have an uneasy, paradoxical relationship with height; our attitude to it is characterised by an ambivalent mixture of love, fear, reverence, envy, longing, delight, terror and distrust²¹⁶. Unlike cats who (designed to climb) may land uninjured on their feet following a fall from considerable height (thanks to a spectacularly gyroscopic inner ear and limber form), human beings are far less well equipped and a great deal more fragile²¹⁷. Despite there being innumerable ways in which we may injure, maim or even kill ourselves, trips, slips and falls from height account for a surprisingly large proportion of these, (and many occur within or around our buildings²¹⁸. As a species therefore, we have learnt to fear heights and this fear manifests early, even while we are infants who cannot walk²¹⁹. By the time we are adults (when we will almost certainly have experienced injury at the hands of gravity) apprehension as to the potentially painful or terminal nature of an unintentional descent followed by an unfortunate landing is an instinct so well ingrained that there is no need, as the architect Gordon Cullen suggests in his book *A Concise Townscape* (1969) to put 'a man on the edge of a 500-ft cliff' in order for him to experience 'a very lively sense of position'²²⁰.

Figure 23: Tigers love to climb

Figure 25: Skateboard fail

Figure 24: Free-fall; how a falling cat defies the law of conservation of angular momentum - by not being a rigid body

Figures x - x: cats, having evolved to climb, have adapted extremely well to cope with unintentional falls. . Humans are not quite so well adapted

²¹⁶ Harries, K. (2000). *The ethical function of architecture*. p192.
²¹⁷ Morris, D. (2002). *Catwatching*. p106. Ornstein, R. E. and Ehrlich, P. R. (2000). *New world new mind: moving toward conscious evolution*. p20. Allen, E. (2005). *How buildings work: the natural order of architecture*. p57. Vogel, S. (2009). *Glimpses of creatures in their physical worlds*. pp254-256. Allsop, B. (1974). *Towards a humane architecture*. p8.
²¹⁸ Allen, E. (2005). *How buildings work: the natural order of architecture*. p20. McNoe, B., Langley, J., Driscoll, T. and Feyer, A. (2005). *Work-related slip, trip and fall injuries in New Zealand*. pp1-28. Kool, B., Ameratunga, S., Hazell, W. and Ng, A. (2010). *Unintentional falls at home among young and middle-aged New Zealanders resulting in hospital admission or death: context and characteristics*. pp1-2, 6. Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p25. World Health Organisation. (2007). *International statistical classification of diseases and related health problems: 10th revision version for 2007*. (available online). Stephenson, S., Langley, J. and Trotter, M. (2005). Appendix 1: Listing of ICD-9 External Cause Codes at 3 Digit Level. In *Impact of injury in New Zealand*.
²¹⁹ Gibson, E. J., and Walk, R. D. (1960). *The visual cliff*. pp67-71. Ronald, M., Kahn, A. P., and Marks, I. M. (foreward). (2000). *The encyclopaedia of phobias, fears, and anxieties: second edition*. pp131, 220, 470. Stein, D. J., Hollander, E. and Olasov Rothbaum, B. (2009). *Textbook of anxiety disorders*. p531.
²²⁰ Cullen, G. (1969). *The concise Townscape*. p10.

..... love

If there is a particular age when height is especially attractive to humans however, it is when we are very young children, especially between the ages of one and six²²¹. Despite our evident aversion to heights as infants (as noted above), when a little older and aware of our tiny stature in an adult sized world, any vantage point that raises a child safely to the level of adults, or preferably higher, is almost always a source of great delight²²². The ability, when sufficiently agile / capable enough to climb and achieve this advantage for one's self, is even more delightful²²³. Children love to climb and elevate themselves, to experience different heights and explore changes in level, and even as adults who have long since become more sedate (or like to think we have), we recognise this; we frequently design playgrounds such that they possess all manner of steps, ladders, climbers, ramps, slides, catwalks, forts, lookouts and platforms for children to clamber up, on, over, above, down, through and under, exercising their bodies and imaginations as they do so²²⁴. Of course, thanks to the latter, anywhere and anything can be a playground to a child, and frequently is, but height is particularly beguiling; beginning as small beings in an adult sized world we experience and gain awareness of the disadvantages of shortness and the advantages height can bring very early in our lives, even if we cannot yet articulate them²²⁵. We instinctively recognise that from a height we can see further, watch others, avoid them and hide²²⁶.

- ²²¹ Hendricks, B.E. (2001). *Designing for Play*. p94. Rojals del Alamo, M. (2005). *Design for fun: playgrounds*. p268. Saracho, O. (2006). *Handbook of research on the education of young children*. p316. Thompson, D., Hudson, S. and M. Mack (1999). Matching children and play equipment: A Developmental Approach in *Learning through play: tools and equipment*. pp6-12.
- ²²² Saracho, O. (2006). *Handbook of research on the education of young children*. p316. Pinker, S. (2007). How The Mind Works. In Dawkins, R. (Ed.), *The Oxford book of modern science writing* (p109.)
- ²²³ Hendricks, B.E. (2001). *Designing for Play*. p68. Rojals del Alamo, M. (2005). *Design for fun: playgrounds*. p274, 287-288. Elkind, D. (2007). *The power of play: learning what comes naturally*. p82. Frost, J. L. (2010). *A history of children's play and play environments: toward a contemporary child-saving movement*. pp185, 190. Smith, P. K. and Gosso, Y. (2010). *Children and Play*. pp99-100.
- ²²⁴ Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p221. John, G., Yamadaa, Y. and Moritab, M. (2007). *Recreational tree-climbing programs in a rural Japanese community forest: social impacts and "fun factors"* pp169-179. Sandseter, E.B.H. and Kennair, L.E.O. (2011). *Children's risky play from an evolutionary perspective*. pp265-266. Lawson, B. (2001). *The language of space*. p208.
- ²²⁵ Hendricks, B.E. (2001). *Designing for Play*. pp75, 106,138-139. Elkind, D. (2007). *The power of play: learning what comes naturally*. p113. Frost, J. L. (2010). *A history of children's play and play environments: toward a contemporary child-saving movement* pp183-184. Oncua, E. C. and Unluera, E. (2010). *Preschool children's using of play materials creatively*. pp4457-4458, 4461. Sandseter, E. B. H. (2009). *Characteristics of risky play*. pp6-7, 10-13. Saracho, O. (2006). *Handbook of research on the education of young children*. p316. Sandseter, E. B. H. (2009). *Affordances for Risky Play in Preschool: The Importance of Features in the Play Environment*. pp439-440. Sandseter, E. B. H. (2009). *Children's Expressions of Exhilaration and Fear in Risky Play*. p103. Wardle, F. (1987). *Outdoorplay: designing, building, and remodelling playgrounds for youngchildren*. (Online.) Lawson, B (2001). *The language of space*. pp207-210. Saracho, O. (2006). *Handbook of research on the education of young children*. p316. Pinker, S. (2007). How The Mind Works. In Dawkins, R. (Ed.), *The Oxford book of modern science writing* (p109.) de Botton, A. (2006). *The architecture of happiness*. p247. Platt, C. (2005). *The inhabited perimeter and the inclusive room*. pp199, 201.
- ²²⁶ Appleton, J. (1975). *The Experience of Landscape*. p57. Lawson, B. (2001). *The language of space*. p211.

Unfortunately one of the things that children most love to play on – stairs - for their attractive combination of elevation, novelty of form and child sized scale which enables steadier (four-limbed) crawling, clambering and seating, is also one of the most dangerous to them, and happens to be ubiquitous in and around our buildings²²⁷. At a very young age, between crawling (usually at age eight months) and beginning to walk, (around about twelve months) our desire to explore greatly exceeds our ability to do so safely and unguarded stairs are a frequent cause for accidents for newly mobile children whose curiosity outweighs their motor and perceptory skills²²⁸. By the age of two however, most children have successfully mastered ascending and descending stairs without assistance and enjoy doing so, confident that their perceptory skills enable them to recognize stairs as a hazard that their improved motor skills allow them to exert sufficient control to negotiate them safely – at least - if they concentrate²²⁹. Unfortunately, humans are quite slow to mature compared to other mammals and still possess a very limited capacity for rational and impulse control as this age – as with adults (see section 1.1.7, p24) tempting distractions can easily reduce concentration. Playgrounds that feature stairs, steps and platforms need to be carefully designed to minimise harm from (inevitable) falls, and attention encouraged when encountering them elsewhere²³⁰.

Figure 26: Two limbs good four limbs better at least while learning

Figure 27: When stairs become a playground

- ²²⁷ Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p13. Bergera, S.E. Theuring, C. and Adolph, K.E. (2007). *How and when infants learn to climb stairs*. pp36, 46-47. Allen, E. (2005). *How buildings work: the natural order of architecture*. p10. Beaulieu, F. G. D., Pelland, L., Gordon, D. and Robertson, A. (2007). *Kinetic analysis of forwards and backwards stair descent*. p564.
- ²²⁸ Bergera, S.E. Theuring, C. and Adolph, K.E. (2007). *How and when infants learn to climb stairs*. pp36, 46-47.
- ²²⁹ Bergera, S.E. Theuring, C. and Adolph, K.E. (2007). *How and when infants learn to climb stairs*. p39.
- ²³⁰ Sandseter, E.B.H. and Kennair, L.E.O. (2011). *Children's risky play from an evolutionary perspective*. p260. Teckline, J. S. (2008). *Paediatric physical therapy*. pp56-59. Sigelman, C. K., and Riorer, E. A. (2003). *Lifespan human development*. pp138-139. Damon, W. and Lerner, R. M. (2003). *Handbook of child psychology*. pp193-196 480, 494. Wilk, R. and Haenn, N. (Ed.) (2006). *The environment in anthropology: a reader in ecology, culture and sustainable living*. pp147-148. Grunwald, M. [Ed.]. (2008). *Human haptic perception: basics and applications*. pp216, 493. Goldstein, E. B. (2010). *Sensation and perception. eighth edition*. p380.

.... hate

What makes a stair a delightful playground when are children and when are bodies are (ideally) youthfully healthy, fit and strong, can become a different story as we age and our bodies and senses deteriorate. Our muscles and bones lose flexibility, density and strength, our sensory capabilities (especially visual acuity) diminish and our somatosensory and proprioceptive acuities weaken²³¹. Walking, even on a level surface, can become more challenging for us, while the ascent and descent of stairs becomes increasingly laborious and difficult²³². As a result we are at a greater risk of an accident, for which reason it is well documented that the elderly will oftentimes avoid stairs if possible for fear of experiencing exactly that²³³. These physical and sensory deteriorations can be compounded by other factors such as the polydosage of medication (for the ailments to which we become increasingly prone with age), fatigue or alcohol. Considerable research exists internationally to demonstrate that falls are the biggest cause of injury and death in people over the age of 65, and falls on stairs are responsible for a large proportion of these²³⁴. But even though the elderly may wish to evade them, their ubiquity in our environment – our homes, our public buildings, our streets, can make them very difficult to avoid²³⁵.

.... terror

the staircase it is the place for nightmares and fears – deserted stairs – for suicides and vertigo²³⁶.

Given, as noted above, our fragility, a general wariness as to heights (especially heights over a certain range) is not illogical, it is sensible; behaviour well founded on the fear of injury or death as a consequence of an unintentional fall from height²³⁷. This wariness is thought to have developed quite early in our evolution, and although it may be impacted by cultural beliefs, is thought to be common to most societies²³⁸. It is a logical response that evolved to aid our survival, and has been termed as the concept of ‘preparedness’; an awareness of real, potential threats to wellbeing and survival, or as more contemporary scholars have termed it, ‘an evolved module for fear learning’ (without which as previously noted, our evolutionary trajectory would have been markedly shorter)²³⁹. Unfortunately, for some people, a natural caution with regard to heights may become so excessive (as a result of traumatic experience or repeated trauma, but sometimes for no readily apparent reason), as to develop into an irrational and disabling psychopathology of extreme anxiety, to the point of terror²⁴⁰. Acrophobia, the fear of heights, (from the Greek, akros, at the end, top, summit, and phobias, fear,) is just one of a range of problems we may experience, irrespective of age or culture, with regard to our environment and spatial conditions²⁴¹. It is actually one of the most common of all phobias; some 2-5% of the global population is thought to suffer from it at any given time²⁴². Agoraphobia, an anxiety disorder frequently associated with a cluster of phobias such as fear of having to leave small, familiar places, fear of being in public places or fear of unfamiliar,

²³¹ Lackner, J. R. and DiZio, P. (2005). *Vestibular, proprioceptive, and haptic contributions to spatial orientation*. p129.

²³² Reevesa, N. D., Spanjaarda, M., Mohagheghia, A.A, Baltzopouloua, V. and Maganarisa C. N.(2006). *The demands of stair descent relative to maximum capacities in elderly and young adults*. pp218-227.

²³³ Hermana, T. Inbar-Borovskya, N. Brozgolga, M. Giladia, N. and Hausdorffa, J. M. (2009). *The dynamic gait index in healthy older adults: the role of stair climbing, fear of falling and gender*. pp237-240. Scott, A. (2005). *Falls on stairways – literature review*. p14.

²³⁴ Wyatta, J. P., Beard, D. and Busuttill, A. (1999). *Fatal falls down stairs*. pp31, 33.

²³⁵ Riener, R., Rabuffetti, M. and Frigo C. (2002). *Stair ascent and descent at different inclinations*. pp32–44. Novaka, A. C. and Brouwer, B. (2010). *Sagittal and frontal lower limb joint moments during stair ascent and descent in young and older adults*. p54. Beaulieu, F. G. D., Pelland, L., Gordon, D. and Robertson, A. (2007). *Kinetic analysis of forwards and backwards stair descent*. p564. Saywell, N. (2010). *Age dependent differences in attenuation of vertical ground reaction force during a step descent*, pp8, 33-34.

²³⁶ Ponti, G. (1960). *In praise of architecture*. p117.

²³⁷ Sandseter, E.B.H. and Kennair, L.E.O. (2011). *Children's risky play from an evolutionary perspective*. pp258, 262. 274-275. Pinker, S. (2007). From How the Mind Works. In Dawkins, R. (Ed.), *The Oxford book of modern science writing* (pp106-109.) Stein, D. J., Hollander, E. and Olasov Rothbaum, B. (2009). *Textbook of anxiety disorders*. pp141, 531. Singer, B. (2009). *Like sex with gods, an unorthodox history of flying*. p15.

²³⁸ Barlow, D. H and Durand, V. M. (2008). *Abnormal psychology: an integrative approach*. pp142-143,145.

²³⁹ Gibson, E. J., and Walk, R. D. (1960). *The visual cliff*. pp67–71. Weiten, W. (2010). *Psychology: themes and variations: eighth edition*. p585. Sandseter, E.B.H. and Kennair, L.E.O. (2011). *Children's risky play from an evolutionary perspective*. p262. Pinker, S. (2007). How the Mind Works. In Dawkins, R. (Ed.), *The Oxford book of modern science writing* (pp106-109.) Ornstein, R. E. and Ehrlich, P. R. (2000). *New world new mind: moving toward conscious evolution*. pp30-31.

²⁴⁰ Stedman's Medical Dictionary for the Health Professions and Nursing, Illustrated, Sixth Edition (Stedman's Concise Medical Dictionary) [Hardcover] p1,098. Sandseter, E.B.H. and Kennair, L.E.O. (2011). *Children's risky play from an evolutionary perspective*. p262. Stein, D. J., Hollander, E. and Olasov Rothbaum, B. (2009). *Textbook of anxiety disorders*. pp141-142 530.

²⁴¹ Ronald, M., Kahn, A. P., and Marks, I. M. (foreward). (2000). *The encyclopaedia of phobias, fears, and anxieties: second edition*. pp131, 220, 470.

²⁴² Juan, M.C., Perez, D., Tomas, D. Rey, B. Alcaniz, M., Botella, C. and Banos, R. (2005). *An Augmented Reality system for the treatment of acrophobia*. p315. Coelho, C. M., Waters, A. M., Hine, T. J. and Wallis, G. (2009). *The use of virtual reality in acrophobia research and treatment*. pp563-564.

wide or open spaces, is also widespread and longstanding, (it was described as early as the fifth / fourth centuries BCE by Hippocrates or a fellow physician in the Hippocratic Corpus), as is claustrophobia, the fear of enclosed spaces or being restricted in some other manner²⁴³. Other situational phobias include the fear of being underground (related to claustrophobia) and bathophobia, the fear of depths²⁴⁴. For sufferers of bathmophobia, the fear of stairs and inclines, or climacaphobia, fear of the use of stairs, an inability to navigate this particular aspect of our environment can be every bit as limiting²⁴⁵. As noted previously, stairs, steps and changes in level are *everywhere*, especially in densely packed urban areas where buildings must go up because they cannot go out, and / or hillside locations where even the streets may become steps to enable their easier navigation²⁴⁶. Stairs and steps are an immutable part of the built environment, part of the basic fabric of our towns and cities, our buildings and our homes, from which there may be little escape²⁴⁷.

Fortunately, the health professions have made great advances in the therapeutic treatment of anxiety disorders and specific and environmental phobias using such techniques as desensitization, Nuero Emotional Therapy™ and augmented and virtual reality. These therapies and pharmacotherapeutic medications in the form of anti-anxiants and tricyclic anti-depressants can achieve great relief for sufferers, and in some cases, effect a permanent cure²⁴⁸. Unfortunately, other disorders that we experience in relation to our perception and experience of height and space that occur as a result of sensory and neurological deficits may

not be so successfully overcome²⁴⁹. Disorders of our vestibular system such as vertigo, tinnitus and labyrinthitis are all examples of physical pathologies / conditions that can impair the proprioceptive and somatosensory systems that enable us to perceive the movement and position of our joints in relation to the body and maintain postural equilibrium²⁵⁰. They can result in a sufferer being or becoming unable to tolerate heights, changes in level, or unable to navigate stairs or inclines which may then result in anxiety disorders also, and for which there may be no treatment. Spatial pathologies extend to all our senses including the proprioceptive. For humans, much as on the one hand we might wish for the freedom of endless (infinite) space, it is the ability to be able to orient and perceive our bodies within it through proprioception and somatosensation, our ability to feel our *place*, that is glorious; the *inability* to orient ourselves within that space, both horizontally and vertically, (using proprioception), to have no (sense of) *place*, is almost as terrifying a prospect as falling (unintentionally) from height²⁵¹.

Figure 28: Stairway of terror. Definitely a place that offers the potential for fear and / or nightmares, even for those who are not acro/bathmophobic

²⁴³ World Health Organisation. (2007). *International statistical classification of diseases and related health problems: 10th revision version for 2007*. Chapter 5 Mental and behavioural disorders (F00 – F99) Neurotic, stress-related and somatoform disorders (F40 – F48) F40.0 Agoraphobia. F 40.2 (online). Ronald, M., Kahn, A. P., and Marks, I. M. (foreward). (2000). *The encyclopaedia of phobias, fears, and anxieties: second edition*. pp137-138. McNally, R. J. (1994). *Panic disorder: a critical analysis*. p29. Stein, D. J., Hollander, E. and Olasov Rothbaum, B. (2009). *Textbook of anxiety disorders*. pp370-371. Cullen, G. (1969). *The concise townscape*. p29. Saul, H. (2004). *Phobias: fighting the fear*. pp17-19. Boardman, J., Griffin, J. and Murray, O. (1986). *The Oxford history of the classical world*. p230. Blackburn, S. (2005). *The Oxford dictionary of philosophy*. p167. Blore, D.C (1993). *Treating a miner with underground phobia*. p1021. ²⁴⁴ Marks, I. M. (2000). *The encyclopaedia of phobias, fears, and anxieties: second edition*. pp131-470. ²⁴⁵ Beaulieu, F. G. D., Pelland, L., Gordon, D. and Robertson, A. (2007). *Kinetic analysis of forwards and backwards stair descent*. p564. Bergera, S.E. Theuring, C. and Adolph, K.E. (2007). *How and when infants learn to climb stairs*. p36. Sennot, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. p459. ²⁴⁷ Riener, R., Rabuffetti, M. and Frigo C. (2001) *Stair ascent and descent at different inclinations*. pp32–44. Novaka, A. C. and Brouwer, B. (2010). *Sagittal and frontal lower limb joint moments during stair ascent and descent in young and older adults*. p54. Beaulieu, F. G. D., Pelland, L., Gordon, D. and Robertson, A. (2007). *Kinetic analysis of forwards and backwards stair descent*. p564. Saywell, N. (2010). *Age dependent differences in attenuation of vertical ground reaction force during a step descent*. pp8, 33-34. ²⁴⁸ Coelho, C. M., Santos, J. A., Silva, C., Wallis, G., Tichon, J. and Hine, T. J. (2008). *The role of self-motion in acrophobia treatment*. pp723-725. Blore, D.C (1993). *Treating a miner with underground phobia*. p1021. Jensen, A. M. and Ramasamy A. (2009). *Treating spider phobia using neuro emotional technique™: findings from a pilot study*. pp1,363–1,374. Juan, M.C., Perez, D., Tomas, D. Rey, B. Alcaniz, M., Botella, C. and Banos, R. (2005). *An Augmented Reality system for the treatment of acrophobia*. pp315-318. Ronald, M., Kahn, A. P., and Marks, I. M. (foreward). (2000). *The encyclopaedia of phobias, fears, and anxieties: second edition*. p47. Stein, D. J., Hollander, E. and Olasov Rothbaum, B. (2009). *Textbook of anxiety disorders*. pp533-538.

²⁴⁹ Coon, D. and Mitterer, J. (2010). *Introduction to psychology: gateways to mind and behaviour twelfth edition*. pp505-506. Coon, D. (2005) *Psychology: a modular approach to mind and behaviour*. pp537-541. ²⁵⁰ Lephart, S. M. and Fu, F. H. (2000). *Proprioception and neuromuscular control in joint stability*. pp39-40. ²⁵¹ Goldstein, E. B. (2010). *Sensation and perception. eighth edition*. p330. Sacks, O. (1998). *The man who mistook his wife for a hat: and other clinical tales*. pp43-54. (Chapter 3: The Disembodied Lady). Exner, U. and Pressel, D. (2009). *Spatial Design*. pp12, 39-41. Harries, K. (2000). *The ethical function of architecture*. pp174-175, 182, 226. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. pp50-54. Coles, J. and House, N. (2007). *The fundamentals of interior architecture*. p16.

..... relationship

And what's this thing coming toward me very fast? So big and flat and round, it needs a big wide sounding name like 'Ow', 'Owng', 'Round', 'Ground'! That's it! Ground. I wonder if it'll be friends with me?²⁵²

Despite these situational and spatial terrors, and their longstanding and widespread nature and origins as normal environmental responses to potential danger, our desire to exploit the benefits of the vertical (in addition to those of the horizontal plane) is thought to be equally longstanding²⁵³. Although neither originally fully ground dwellers nor bipedal, humans became both at some point (the nature of when exactly remains subject to debate)²⁵⁴. But even though we evolved to exchange the precarious realm of trees for the greater stability of the ground plane, the controlled use of height still offered certain advantages in terms of survival of which we remained aware and which we continued to exploit. Heights provided, and still provide us, with views, retreat and protection. The incorporation of these advantages into our buildings, even the earliest ones as at Catal Huyuk for defence (against both elements and animals if not enemies), was a logical step²⁵⁵. The ability to exploit vertical space in addition to the horizontal, thanks to the invention of the ladder, the step and the stair, would inevitably spark an awareness of the spatial possibilities eventually and act as a further impetus to exploit the space to be gained from height for our gain, in turn triggering new uses and desires, including that of further upward extension²⁵⁶.

Despite obvious differences in intention and capability (and aside from the issues of survival advantage and variances in technical challenge), architecture like aviation, is similarly poetic and mythologic in nature; the two endeavours are united by our reverence of and yearning for the heavens, and the symbolic associations with which we have imbued them (the divine, the spirit, release etc.). Unfortunately, also like aviation, architecture is subject to the forces

of gravity, the natural enemy of aeroplanes, architecture and humans alike²⁵⁷. Even if and as we build up (as our conurbations increasingly demand that we do due to lack of space, topographical constraints, cost, and population increases and movements), we are still limited by our skills, materials, knowledge and physics. We can still only occupy height within the confines of or atop a building, or enabled by some kind of mechanical / technological assistance; and the former remains (generally) locked to the ground and occupation via the latter is usually temporary²⁵⁸. Though we travel into space we cannot (yet) dwell there and even when we climb mountains our feet still touch the earth²⁵⁹. So pure height for humans is unattainable, we revere height because despite all our efforts, we cannot yet freely attain it²⁶⁰. We remain tethered - restricted - to the ground plane²⁶¹. Our world is fundamentally ruled by the horizontal²⁶².

Relationships then, are generally complicated, intricate things and it can be seen that that of humanity's with height is no exception; it, like many relationships exists in a confused, uncertain and paradoxical mire of love, distrust, delight, resentment, fear and bravado. It is characterised by our curiously obsessive and obstinate desire to overcome and tame height on the one hand tempered with millennia's worth of biologically hardwired wariness on the other. We long to exploit height but fear the consequences of inadvertent mistakes as we attempt to do so. And every time we are in a position to observe a vista, an expansive horizon from the vantage point of height, even as we delight in it, we are reminded once again, all too uncomfortably, of our frailty, diminutive scale, and subordination to the horizontal and the seeming impossibility of our dream for vertical freedom²⁶³.

²⁵² Adams, D. and Gaiman, N. (2002). *The ultimate hitchhiker's guide to the galaxy*. pp90-91.

²⁵³ Heerwagen, J. (undated). Psychosocial Value of Space. In *Whole building design guide*. (online.) Appleton, J. (1975). *The Experience of Landscape*. p57.

²⁵⁴ Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp21-22, 644. Ornstein, R. E. and Ehrlich, P. R. (2000). *New world new mind: moving toward conscious evolution*. pp19, 22, 34-35. Allsopp, B. (1974). *Towards a humane architecture*. pp1-2.

²⁵⁵ Habermann, K. J. (2003). *Staircases: design and construction*. p10. Porsolt, D. I. V. (1981). *The history and design of vertical communication*. p1. Farrelly, L. (2007). *The fundamentals of architecture*. p38. Templer, J. A. (1992). *The staircase: history and theories*. p61. Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p39. Kostof, S. (1995). *A history of architecture: settings and rituals*. p50. Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p9. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p3. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. pp36-37.

²⁵⁶ Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p39.

²⁵⁷ Vogel, S. (2009). Glimpses of creatures in their physical worlds. p95, p242-244. Harries, K. (2000). *The ethical function of architecture*. p189.

²⁵⁸ Alexander, D. E. (2009). *Why don't jumbo jets flap their wings? Flying animals, flying machines and how they are different*. p1. Harries, K. (2000). *The ethical function of architecture*. p182.

²⁵⁹ Harries, K. (2000). *The ethical function of architecture*. p192.

²⁶⁰ Templer, J.A. (1992). *The staircase: histories and theories*. p34, 36, 44. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. pp26, 77. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp73-74, 89-90. Eliade, M. and Smith, J. Z. (2005). *The myth of the eternal return: cosmos and history*. pp12-16. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp34-35.

²⁶¹ Stewart, T. and Cohen, J. (1997). *Figments of reality: the evolution of the curious mind*. p227. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. p65. Quantrell, M. (1974). *Ritual and response in architecture*. p117. Harries, K. (2000). *The ethical function of architecture*. p189.

²⁶² Allsopp, B. (1974). *Towards a humane architecture*. pp1-3, 85. Ching, F. D. K. (2007). *Architecture: form, space and order*. pp21-29, 36, 109, 118. Singer, B. (2009). *Like sex with gods, an unorthodox history of flying*. pp3, 13-14. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. pp379-381. Coles, J. and House, N. (2007). *The fundamentals of interior architecture*. p24.

²⁶³ Harries, K. (2000). *The ethical function of architecture*. p192. Vogel, S. (2009). Glimpses of creatures in their physical worlds. p95. Singer, B. (2009). *Like sex with gods, an unorthodox history of flying*. p3. Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. p54. Hallion, R. P. (2003). *Taking flight: inventing the aerial age from antiquity through the first world war*. p11. Ross, L. (2009). *Art and architecture of the world's religions*. pp25, 39. Heerwagen, J. (undated). Psychosocial Value of Space. In *Whole building design guide*. (online.)

1.1.11 Flights of Fancy

Perhaps because it is only in the last one hundred and fifty years that we have been able to attain very great heights in our built forms (and as an added feather in humanity's collective cap created some buildings like the CCTV building in China that appear to cheat gravity and defy physics whilst doing so), that we have historically attributed to height all those things that we long for, for which we have no definitive answer, remain unable to attain and which we thus continue to aspire to and revere.

Figure 29: The great ziggurat at Ur - the beginning of the monumental stairway (see section 1.2.2, page 48)

Figure 30: China central television headquarters, Beijing, 2008, by architects Rem Koolhaas and Ole Scheeren of OMA Architects, and Arup Engineers. The building is 234m - 44 stories - tall. The height is not excessively tall nowadays but the building is striking for its radical loop shape, which gives the appearance that it could topple over at any moment

For millennia now, societal leaders (kings, emperors, nobles, statesmen, leaders, dictators and politicians) have attempted to lay claim to and defend territories and demonstrate might and status whilst doing so, through the act of elevating their built seats of power – palaces, castles, keeps, forts – by making use of existing topographical height and / or artificially constructing it in these built forms²⁶⁴. Priests, whether also at the behest of such rulers or from their own desire to serve and glorify god (or gods depending upon your point of view), and oftentimes themselves, have done likewise²⁶⁵. Conversely, depth, the realm below the everyday of our ground plane has become the underworld, where buried beneath the oppressive mass and weight of darkness and dirt, we are enclosed, relegated to our eternal chastisement, as the greatest physical extremity possible from the longed for freedom, light and purity of heaven's reward for an earthly life well lived. These associations are now so longstanding and widespread that we give little thought to them, or their influence upon us in terms of our buildings and architecture - and therefore the stair - but their origins are complex, their associations far reaching, and all have implications for our relationship with architecture in general and to the stair in particular.

Humans have long sought to explain many fearful, mysterious phenomena and cataclysmic events that are beyond our understanding and control by creating gods and goddesses²⁶⁶. Unfortunately, by most accounts, gods of all stripes have been somewhat temperamental, quarrelsome creatures at one time or another - no matter what the originating culture – every bit as subject to the vanities, bickering, greed, jealousies, argumentative squabbles and brawls for power as their lesser human subjects²⁶⁷. This is as good a reason as any then for humanity's longstanding and general tendency of (once having invented them) keeping deities stashed away in the heavens or the depths of the earth²⁶⁸. Here, presumably, the damage they can inflict is supposedly somewhat diluted by distance and rather than terminal,

²⁶⁴ Kostof, S. (1995). *A history of architecture: settings and rituals*. p12. Hatton, B. (2006). *The Problem of Our Walls*. In Madge, J. and Peckham, A. (Ed[s].), *Narrating architecture: a retrospective anthology* (p176). Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p74. Exner, U. and Pressel, D. (2009). *Spatial Design*. p41. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p77.

²⁶⁵ Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp76, 90, 96. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p77. Day, C. (2002). *Spirit and place*. p117. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p5.

²⁶⁶ Daly, K. (2004). *Norse mythology*. pix. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p38. Einstein, A. (2007). *Religion and Science*. In Dawkins, R. (Ed.), *The Oxford book of modern science writing* (p236-7). Ross, L. (2009). *Art and architecture of the world's religions*. p75.

²⁶⁷ Ross, L. (2009). *Art and architecture of the world's religions*. p25. Roman, L. and Roman, M. (2010). *Encyclopedia of Greek and Roman mythology*. p12, 71, 91, 143, 157-158, 203-204, 215, 266, 288, 523.

²⁶⁸ Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p77. Clark, K. (1971). *Civilisation*. p135. Lawson, B. (2001). *The language of space*. p170. Singer, B. (2009). *Like sex with gods, an unorthodox history of flying*. p15. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p16. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p5.

all-consuming obliteration, is limited to episodic bouts of temper such as a few random thunderbolts issued in a fit of pique (Zeus), the odd irritable flood (Jehova), spiteful drought (Sekhmet), vengeful plague (Apollo), or recriminatory fire (Viracocha) - to mention just a few - in response to some slight or insufficiency of devotion²⁶⁹.

But, therein lies a problem, or several, one of which is *access*. Gods and their domains are all very well remote, after all, if one could access them easily, they would not be *Gods*, but the ascension of mortals to the heavenly realm should not be *impossible*, nor should the Gods feel unwelcome in the mortal world²⁷⁰. There has to be a bridge between the world of the gods – the sky – and the world of humanity – the earth (and for the unlucky, the underworld)²⁷¹. A ladder or a stair is the logical choice. A stair to the gods can perform exactly the same functions as it does on earth – transit – in this case descent for the gods to the earth and ascent skywards for humanity – and connection – for the transmission and reception of divine and mortal communication²⁷².

Naturally, a stair for a deity must be somewhat bigger and higher than that for humans; gods, being supernatural, are larger than (human) life, so their buildings - monuments, places of worship and earthly residences alike - must be too. The vast stepped temples and palaces of Mesopotamia - the ziggurats - are the oldest known monumental structures in existence. These elaborate ventures were not intended to fulfil the mundane, functional needs of the everyday – dwelling - but were devoted to the worship of the (many) deities²⁷³. They typically comprised a series of stacked platforms the highest of which formed the temple for the deity in whose honour it had been contrived, reached by an elaborate and carefully planned network of more appropriately, humanly scaled, stairways²⁷⁴. Whilst originally the temples may have been elevated and enlarged to raise and protect them against the regular flooding of the region, the devotional purposes for which they existed ensured that the associated rituals became ‘elevated’ also in terms of importance, (as did the status of those performing them) above mundane life²⁷⁵. As this pragmatic purpose became increasingly associated with poetic meaning, the height of the ziggurats increased, further emphasising the difference

between the elevated, significant experiences of the sacred and those that belonged to the lower realms of the everyday²⁷⁶. The increase in height, and correspondingly, scale and proportion also, became a reflection of the reverence afforded to the matters considered above those of everyday life – worship of the gods - but upon which everyday life depended²⁷⁷. Whilst colours, materials, texture and techniques were also skilfully used to convey meaning and create and manipulate experience, it was elevation that remained the constructional technique of greatest importance, and elaborate stairways and ramps that enabled the priests to ascend to the temples atop these great pyramids. This was the beginning of architecture as the monumental and the stair as processional device²⁷⁸.

The vertical has, historians and scholars seem to agree, been widely associated with the sacred ever since the rise of the Babylonians and Sumerians of Mesopotamia, as the first great civilisations²⁷⁹. Concepts such as family, community, relationships, labour and hierarchy are widespread amongst different human societies, but interpretation as to the exact nature of these may vary between to an extraordinary degree²⁸⁰. Yet among diverse cultures, separated by vast gulfs of distance, topography or time, the association of divinity, spirituality, purity and devotion with height, light and space is not just widespread, it is virtually universal, and for many cultures, very ancient²⁸¹. Values may vary greatly it seems, except with regard to the vertical; reverence and respect for both height and light reign supreme as the domain of the sacred²⁸². Consequently, the situating of buildings of worship and devotion at elevations above the ground plane has become commonplace throughout history irrespective of culture, even if, in the absence of high ground, just through the humblest elevating onto a platform reached by two or three steps²⁸³. The buildings themselves should be appropriately magnificent however. After all, gods cannot be asked to slum it in any old *hut*, at the same lowly plain as common *mortals*. They must feel honoured, revered, not insulted by an insufficiently grandiose display of worship. And mortal gratitude for the withholding of

²⁶⁹ Roman, L. and Roman, M. (2010). *Encyclopedia of Greek and Roman mythology*. pp9, 250. Grant, M. and Hazel, J. (2002). *Who's who in classical mythology*. pp23, 192, 345. Pinch, G. (2002). *Handbook of Egyptian mythology*. p188. Eliade, M. (1968). *The sacred and the profane*. p287.
²⁷⁰ Ross, L. (2009). *Art and architecture of the world's religions*. p33.
²⁷¹ Harries, K. (2000). *The ethical function of architecture*. p140.
²⁷² Singer, B. (2003). *Like sex with gods: an unorthodox history of flying*. pp13-14. Clark, K. (1971). *Civilisation*. p2. Harries, K. (2000). *The ethical function of architecture*. p186.
²⁷³ Day, C. (2002). *Spirit and place*. p117.
²⁷⁴ Braun, M. (2008). *Stairs: architectural details*. p9. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p16.
²⁷⁵ Ross, L. (2009). *Art and architecture of the world's religions*. pp27, 32-33, 40. Ornstein, R. E. and Ehrlich, P. R. (2000). *New world new mind: moving toward conscious evolution*. p50.

²⁷⁶ Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. p76.
²⁷⁷ Templer, J.A. (1992). *The staircase: histories and theories*. p49. Porsolt, D. I. V. (1981). *The history and design of vertical communication*. p1.
²⁷⁸ Porsolt, D. I. V. (1981). *The history and design of vertical communication*. p1. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp76, 90. 96. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p16. Kostof, S. (1995). *A history of architecture: settings and rituals*. p12. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. pp19-20.
²⁷⁹ Templer, J.A. (1992). *The staircase: histories and theories*. p34, 36. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p77. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp73-74, 89-90. Harries, K. (2000). *The ethical function of architecture*. p187. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p16.
²⁸⁰ Eliade, M. and Smith, J. Z. (2005). *The myth of the eternal return: cosmos and history*. pp12-16.
²⁸¹ Kliment, S. A. (2004). *Building type basics for places of worship*. pp11-12, 209.
²⁸² Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p26. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp34-35.
²⁸³ Templer, J.A. (1992). *The staircase: histories and theories*. p44. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. pp2-3, 16.

random acts of disaster must also be perpetually evidenced. Elevation of temples above the common realms of the city was generally an additional recognition of divine superiority and status and served as a kind of appeasement in advance. Placation too was a common cross-cultural factor in godly worship therefore²⁸⁴. Fear of divine wrath or even abandonment were ever-present terrors; avoidance of plague, flood, fire, volcanoes and earthquakes was a constant endeavour²⁸⁵. It made sense therefore, to keep on the good side of those who could enrage the skies and bestir the earth, with appropriate demonstrations of recognition, reverence and devotion²⁸⁶.

The Greeks and Romans understood this. They knew that fitting temples must be provided that would do justice to their deities if they were to feel suitably honoured (and thus inclined to benevolence). They and the Egyptians also turned not just to height, but the perfection of geometric form and proportion also, in the search for guidance and natural laws through which sacred architecture could be established²⁸⁷. As Paul Goldberger notes however, in addition to honouring the gods, 'buildings can tell us what we are and what we want to be'²⁸⁸. And if our own lifespans are somewhat brief in the general scheme of things, our buildings can provide another option for displaying our aspirations or communicating a desired image²⁸⁹. In addition to height, permanence of buildings, whether sacred or secular, conveys a power and might that spans more than a brief moment in time. Kings and prelates may have lived and breathed for only a few decades but their legacies, their wealth, triumph and glory, may live on for many decades more, centuries even beyond that, in the majestic temples, palaces or castles built at their behests²⁹⁰. It is on such a multitude of reigns that time is collectively thwarted and empires - and thus legends - are created²⁹¹.

Once the connection between elevation, the sacred and the long lived had been established then, it was not too long before it was exploited for the benefit of the secular also. The

romans had no qualms about choosing to adopt grandiose heights and proportions for their secular constructions, such as the Parthenon. They chose to regard this demonstration of their own might not as a challenge to their gods but as further evidence of their worthiness of patronage by them²⁹². The Persians too sought height and might. The palace of Persepolis sits atop lofty hills, to be ascended by a great stair, into which the reliefs of thousands of soldier have been carved, just in case anyone should fail to get the message that no one should mess with a culture that can create such a marvel and which must therefore have some pretty powerful gods on its side²⁹³. And it is from the fame of the Babylonian ziggurats at Ur and Uruk that the legend of the tower of Babel is thought to stem²⁹⁴. The Babylonian King Nebuchadnezzar II was apparently obsessed with the building of a ziggurat to be over ninety meters high. The biblical tale relates how humanity, united by a common purpose of self-aggrandizement and uniform language sought to build a tower so high that it would reach Jehovah Himself. Jehovah was obviously somewhat displeased at this effrontery, hence the retributory wrath, destruction of the tower and multi-lingualism that followed²⁹⁵. Despite being a fairly fearsome punishment, this has not however, noticeably deterred us in our efforts to construct tall buildings (staired or not) or otherwise occupy the heavens²⁹⁶.

²⁸⁴ Clark, K. (1971). *Civilisation*. p2. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p40.

²⁸⁵ Roman, L. and Roman, M. (2010). *Encyclopedia of Greek and Roman mythology*. p506.

²⁸⁶ Ross, L. (2009). *Art and architecture of the world's religions*. pp75, 80-84.

²⁸⁷ Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p40, 57, 76-77, 78. Clark, K. (1971). *Civilisation*. P2. Ross, L. (2009). *Art and architecture of the world's religions*. p89. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p4. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. p126.

²⁸⁸ Goldberger, P. (2009). *Why architecture matters*. ppx, 1. Harries, K. (2000). *The ethical function of architecture*. p118. de Botton, A. (2006) *The architecture of happiness*. p13.

²⁸⁹ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p5. Exner, U. and Pressel, D. (2009). *Spatial Design*. p41.

²⁹⁰ Kostof, S. (1995). *A history of architecture: settings and rituals*. pp18-19.

²⁹¹ Kostof, S. (1995). *A history of architecture: settings and rituals*. p12. Hatton, B. (2006). *The Problem of Our Walls*. In Madge, J. and Peckham, A. (Ed[s].), *Narrating architecture: a retrospective anthology* (p176). Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p74. Exner, U. and Pressel, D. (2009). *Spatial Design*. p41.

²⁹² Templer, J.A. (1992). *The staircase: histories and theories*. p49. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p29. Roman, L. and Roman, M. (2010). *Encyclopedia of Greek and Roman mythology*. pp171, 480. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p16.

²⁹³ Palmer, A. L. (2008). *Historical Dictionary of Architecture*. pxxiv. Templer, J.A. (1992). *The staircase: histories and theories*. p47.

²⁹⁴ Ross, L. (2009). *Art and architecture of the world's religions*. pp25, 39. Templer, J. A. (1992). *The staircase: history and theories*. p23. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p24.

²⁹⁵ Pinker, S. (2007). *The Language Instinct*. In Dawkins, R. (Ed.), *The Oxford book of modern science writing* (p105.). Harries, K. (2000). *The ethical function of architecture*. p184. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. pp137-138.

²⁹⁶ Harries, K. (2000). *The ethical function of architecture*. p184. Strakosch, G. and Caporale, R. S. (2010). *The vertical transportation handbook*. pp327-328, 565.

Figure 31: The tower of Babel (ca. 1563) by Pieter Bruegel the Elder (1525 – 1569), a depiction which shows the stepped tower as suffering from an alarming slump.

Figure 32: The great stairways of the Apadana Palace, Persepolis, begun by Darius the Great (ca. 515 BCE) are carved with reliefs of Persian guards, emphasising the King's power to those who must ascend to seek audience

As with height, sacred and symbolic significance has been invested in stairs by a wide range of cultures throughout history. Given their earthly purpose of enabling connection by bridging disjunction it is not too surprising that they should have been appropriated to symbolise these functions elsewhere²⁹⁷. Typically, they represent the ascent of humanity towards higher realms, a symbol of a journey upward towards the greater goodness, purity and joy of the heavens²⁹⁸. Conversely, the stair has also become associated with the opposite – the loss of these things – and the darkness, evil, fear, disconnection and misery that may result. The ladder has been used in this manner also, most noticeably in the Biblical account of Jacob's ladder as a means of his ascension towards God²⁹⁹. But ladders are hard work. Their ascent requires concentration which leaves little room for contemplation of spiritual matters. Stairs are a good compromise. The labour of ascent is hard enough to suggest that an effort worthy of the divine must be made, but not so hard that there is no time left for the experience of awe, wonder or amazement at and during the ascent³⁰⁰. Stairways to heaven are typically depicted as grand and mighty, intended to arouse anticipation, generate awe, inspire reverence or even fear³⁰¹.

²⁹⁷ San Pietro, S. and Gallo, P. (2008). *Stairs/scale 2*. p7. Templer, J.A. (1992). *The staircase: histories and theories*. pp7, 13. Day, C. (2002). *Spirit and place*. p235.

²⁹⁸ Harries, K. (2000). *The ethical function of architecture*. p215.

²⁹⁹ Templer, J.A. (1992). *The staircase: histories and theories*. p7.

³⁰⁰ Harries, K. (2000). *The ethical function of architecture*. p215.

³⁰¹ Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p77. Harries, K. (2000). *The ethical function of architecture*. p215.

As gods have been raised above humanity to reflect their exalted status, omnipotence and (hopefully) benevolence, over time, light has become the domain of the mighty also³⁰². The association of light with goodness is a longstanding one, evident in many cultures' religions and myths³⁰³. Plato's followers based their exaltation of light as transcendence on his rather brief words on it as being 'not only the author of visibility in all visible things but of generation and nourishment and growth³⁰⁴'. In the fifth century, Christianity quietly reconciled and incorporated both this tradition and those of the pagans who also applauded light into conventional orthodoxy, such that light became revered as an extension of God's grace, might and beauty and as the source of all life³⁰⁵. The closer to God something was in nature, the more it was represented as radiating His glorious Lux, and the more valued it became³⁰⁶. By the twelfth century, this veneration had increased as Robert Grosseteste (c.1168–1253) of the University of Oxford and his student Roger Bacon (c.1214–92) established some of the founding principles of optics;

Physical light is the best, the most delectable, the most beautiful of all the bodies that exist. Light is what constitutes the perfection and the beauty of bodily forms³⁰⁷.

It was into this climate of illuminatory reverence that the gothic cathedral was born, 'the noble edifice, that is pervaded by new light', the brilliance of the divine³⁰⁸. This notion of light as the means of the revelation of form, truth and beauty became applied to our view of knowledge also with the emergence of European enlightenment philosophy in the eighteenth century³⁰⁹.

³⁰² Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p77. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p198.

³⁰³ Eco, U. (2004) *On Beauty*. pp102.

³⁰⁴ Padovan, R. (1999). *Proportion science philosophy architecture*. p243. Ball, P. (2009). *Universe of stone: a biography of Chartres cathedral*. p232.

³⁰⁵ Ball, P. (2009). *Universe of stone: a biography of Chartres cathedral*. pp239-240, 242. Clark, K. (1971). *Civilisation*. p107. Harries, K. (2000). *The ethical function of architecture*. p109. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p112.

³⁰⁶ Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. pp2, 38. Ball, P. (2009). *Universe of stone: a biography of Chartres cathedral*. p232. Eco, U. (2004) *On Beauty*. pp102. Padovan, R. (1999). *Proportion science philosophy architecture*. pp242-243.

³⁰⁷ Ball, P. (2009). *Universe of stone: a biography of Chartres cathedral*. p243. See also Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p125.

³⁰⁸ Clark, K. (1971). *Civilisation*. p36. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p77. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp363-364. Wigginton, M. (1996). *Glass in architecture*. p15-16. Harries, K. (2000). *The ethical function of architecture*. p109. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p110.

³⁰⁹ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p250. Till, J. (2009). *Architecture depends*. p34.

At this time, it was human intellect and reason that shed light on the world and revealed greater knowledge - including that pertaining to the stair - rather than the lux of God in His heaven³¹⁰.

Figure 33: The upper chapel of Sainte-Chapelle, France (c. 1239-1247). The expanse of the stained glass windows are made possible by the skeletal nature of the masonry framework. The chapel, the only part of the Capetian Palace remaining today, was restored by Viollet-le-Duc in the nineteenth century. As with most gothic ecclesiastical building however, the stair is conspicuous only by its absence..

These relationships, the symbolic importance of height and correspondingly light, to humans - for whatever reasons, love, fear, awe, delight terror etc. - have become so ingrained in our unconscious that they permeate our language. Orientational metaphors abound, where height is positive and depth is negative³¹¹. We're at the height of our powers when we perform at our best or on the up when our star is rising - we're high when we're happy (naturally or artificially) and might high-five to show it and we'll step up to improve or face a challenge but step down to accede, at which we might feel down, or if we felt put down feel belittled, and if we're grieving we might even be in the depths of despair from which we need lifting³¹². We climb the ladder of success and when we reach the top might feel high and mighty, but if we are particularly prideful we may have a fall from grace which will bring us back down to earth³¹³. Sensory metaphors reflect this positive-negative polarity with regards to light also³¹⁴. If we do not understand something we might say we are in the dark, or if we do, that we see the light. If someone is clever we refer to them as switched on, or if not, we might say they are a bit dim³¹⁵.

Physical elevation and its associated terms and concepts, above, on high, raised, elevated, ascent, became invested and associated with spirituality, grace, power, status, might, respect, reverence and exaltation and as a result, superiority, while depth, and it's terms - lowly, beneath, below, descent, came to be associated with the mundane, commonplace, earthly and menial and everyday, and at their most extreme interpretation death, the underworld and punishment³¹⁶. For centuries now we have praised, revered and served that which is high, elevated above us, and associated our fear of its deprivation with the opposite state; depth,

³¹⁰ Ross, L. (2009). *Art and architecture of the world's religions*. p25. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp534-535. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p114.

³¹¹ Templer, J. A. (1992). *The staircase : history and theories*. p36. Lakoff, G. and Johnson, M. (1980). *In metaphors we live by*. pp462-466. Harries, K. (2000). *The ethical function of architecture*. pp157, 192. Cienki, A. (2008). Why Study Metaphor and Gesture? pp8, 11. In Cienki, A. and Muller, C. [Ed.s]. *Metaphor and gesture*. (pp5-25). Lakoff, G. (2008). The neural theory of metaphor. pp28, 34-35. In Gibbs, R. W. Jr. [Ed.] *The Cambridge handbook of metaphor and thought*. (pp17-38). Knowles, M. and Moon, R. (2006). *Introducing metaphor*. pp30-34, 74, 88-89, 115. Knowles, M. and Moon, R. (2006). *Introducing metaphor*. pp30, 32, 67, 103, 108, 113, 115, 120. Kövecses, Z., Benczes, R., Bokor, Z., Csábi, S., Lazanyi, O. and Nucz, E. (2010). *Metaphor: a practical introduction*. pp97.

³¹² Kövecses, Z., Benczes, R. and Csábi, S. (2010). *Metaphor: a practical introduction*. pp19, 21, 40, 43, 82, 196, 276.

³¹³ Singer, B. (2003). *Like sex with gods: an unorthodox history of flying*. p18-19. Templer, J. A. (1992). *The staircase: history and theories*. p36. Harries, K. (2000). *The ethical function of architecture*. p192. Knowles, M. and Moon, R. (2006). *Introducing metaphor*. pp30, 32, 67, 103, 108, 113, 115, 120. Kövecses, Z., Benczes, R., Bokor, Z., Csábi, S., Lazanyi, O. and Nucz, E. (2010). *Metaphor: a practical introduction*. p252.

³¹⁴ Knowles, M. and Moon, R. (2006). *Introducing metaphor*. pp30, 32, 67, 103, 108, 113, 115, 120. Kövecses, Z., Benczes, R., Bokor, Z., Csábi, S., Lazanyi, O. and Nucz, E. (2010). *Metaphor: a practical introduction*. pp21-22, 23-24, 97.

³¹⁵ Lakoff, G. and Johnson, M. (1980). *In metaphors we live by*. p470. Urry, J. (2001). *Sociology beyond societies, mobilities for the twenty-first century*. p80.

³¹⁶ Porsolt, D. I. V. (1981). *The history and design of vertical communication*. p1. Templer, J. A. (1992). *The staircase: history and theories*. p36. Harries, K. (2000). *The ethical function of architecture*. p192. Knowles, M. and Moon, R. (2006). *Introducing metaphor*. pp74, 116, 120. Knowles, M. and Moon, R. (2006). *Introducing metaphor*. pp30, 32, 67, 103, 108, 113, 115, 120. Kövecses, Z., Benczes, R., Bokor, Z., Csábi, S., Lazanyi, O. and Nucz, E. (2010). *Metaphor: a practical introduction*. pp64-65, 69.

entrapment and burial underground³¹⁷. The derivation of these spiritual and theological concepts from the natural world, has then become manifested over time, in our buildings. Even today, for secular reasons, we revere height in our buildings³¹⁸. We used to raise buildings for the glory of God(s) – the higher the building, the greater the devotion. Now the higher the building, the greater the populace that raised it - the more skilled, intelligent, creative, resourceful, daring – powerful - than those unable to overcome the problems associated with height – namely gravity³¹⁹. Skyscrapers have now replaced pyramids and ziggurats and cathedral spires as status symbols, monuments to the glory of capitalism rather than the gods, with the only difference being that the stair, oftentimes glorious as the physical and symbolic facilitator of connection and the means of journey, now more usually remains silent, unseen, invisibly confined within³²⁰.

Figure 34: The Burj Khalifa Hotel, Dubai, 2009. At 828m the hotel is currently the tallest building in the world. By Skidmore, Owings and Merrill, Chicago.

1.1.12 Would You Like Size With That?

Physical size is one of the principal causes of the value and effect of architecture. The reason is that the greatest number of impressions produced by that art derives from the feeling of admiration. And it is natural for man to admire size, which is always related in his mind with the idea of power and strength³²¹.

While our capacity to construct buildings of great height has been hindered until relatively recently by a limited acquaintance with gravity, our relationship with the horizontal dimensions of our buildings has generally been fairly unequivocal, almost as if in compensation; big, is good. And frequently, bigger, is even better. As a means of demonstrating power, grandeur, status, strength and superiority, the size of a monumental, religious, royal or civic building enlarged far beyond the dimensions actually necessary to ensure human use or inhabitation can communicate a message every bit as powerful as that of a building of far greater height – a strategy and judgement we may often appropriate and apply somewhat competitively to our houses also, and as a general principle, to many other aspects of our lives³²².

Stairs are no exception to a general human liking for 'bigness'³²³. Even if it is not necessary to circumvent a great height, a staircase of only a few steps or one that occupies a very gentle gradient may still be treated in such a way that for example, through an exceptional breadth or length and correspondingly generously proportioned treads, it may still convey the desired sense of grandeur³²⁴. As noted previously however, stairs possess a limitation that no other architectural element does, in that while staircases may vary considerably in terms of size and proportion, if the steps of those staircases are to remain safely and easily usable by humans, they must conform to the constraints imposed by the size of the human body and our biomechanical range. The limits of the human capacity to step upwards dictate the maximum possible riser height³²⁵.

³¹⁷ Singer, B. (2003). *Like sex with gods: an unorthodox history of flying*. p18.

³¹⁸ Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp72-73.
Bukowski, R. W. (2009). *Emergency Egress from buildings. part 1: history and current regulations for egress systems design*. p179.

³¹⁹ Harries, K. (2000). *The ethical function of architecture*. p184. Strakosch, G. and Caporale, R. S. (2010). *The vertical transportation handbook*. pp327-328,565. Bukowski, R. W. (2009). *Emergency Egress from buildings. part 1: history and current regulations for egress systems design*. p179. Timberman, J. (2003). *The footprint of the twentieth century: American skyscrapers and modernist poems*. p105. Calbris, G. (2008). From Left To Right: Coverbal Gestures and Their Symbolic Use of Space. p47. In Cienki, A. and Muller, C. [Ed.s]. *Metaphor and gesture*. (pp27-53).

³²⁰ Lawson, B. (2001). *The language of space*. p174. Nash, Eric. (2005). *Manhattan skyscrapers: revised and expanded edition*. pxi. Bukowski, R. W. (2009). *Emergency Egress from buildings. part 1: history and current regulations for egress systems design*. pp187-188. Timberman, J. (2003). *The footprint of the twentieth century: American skyscrapers and modernist poems*. pp98-99, 103-104, 106-107, 109, 118. San Pietro, S. and Gallo, P. (2008), *Stairs/scale 2*. p7.

³²¹ Kostof, S. (1995). *A history of architecture: settings and rituals*. p574.

³²² Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. p356
Goldberger, P. (2009). *Why architecture matters*. p4. Goldberger, P. (2009). *Why architecture matters*. ppx, 1. Harries, K. (2000). *The ethical function of architecture*. p118. de Botton, A. (2006). *The architecture of happiness*. p13. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p5. Exner, U. and Pressel, D. (2009). *Spatial Design*. p41.

³²³ Templer, J. A. (1992). *The staircase: history and theories*. p90. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p104. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp375-376.

³²⁴ Palmer, A. L. (2008). *Historical Dictionary of Architecture*. pxi. Templer, J.A. (1992). *The staircase: histories and theories*. p49. San Pietro, S. and Gallo, P. (2008). *Stairs/scale 2*. p7. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. pp24, 29.

³²⁵ Allen, E. (2005). *How buildings work: the natural order of architecture*. p167. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp52-53. Malnar, J. M. and

But *scale* possesses intriguing possibilities for the stair and its inhabitation beyond that of the overall enlargement that typifies their manipulation as a means of creating and communicating power and grandeur, because the basis upon which *scale* is determined may differ completely³²⁶. *Scale* may be defined as the relationship between a part and a whole, the relationship of one part to others, that of a part to a usual size and that of a part to a human size and any of these in combination and simultaneously³²⁷. In conjunction with these possible scalar relationships and their combinations, differences in expectations, perceptions, proximity, familiarity, sensory capacity, knowledge and socio-cultural factors may all impact upon the manner in which we interpret those relationships³²⁸. *Scale* - and size - it would seem is a far more complex and fluid notion than our typically general supersizing of our buildings – and our stairs - tends to consider³²⁹.

This fundamental principle of *scale* as a correspondence of relationships is well demonstrated by the ability of cats, children and humans in general to colonise stairs for purposes for which they were not intended. In addition to a stair tread comfortably accommodating adult feet, a tread can also accommodate, in relation to their various scales and sizes, a range of occupants and activities that includes perching cats, sleeping children and sitting / lounging adults. This combined capacity of humans (and cats) to appropriate and inhabit an aspect of architecture for alternative purposes and the possibilities for alternative use that scalar relationships can permit, can provide a means of creating delight and playfulness in architecture, especially with regards to the stair, as although common, these casual occupancies are often little recognised³³⁰. As flexibility and ambiguity collide, expectations and perceptions can be challenged and new interactions and relationships can occur between architecture and occupants³³¹. A stair does not have to be big then, to afford delight. Like many things in life in fact, there are no absolutes - *it's all relative*³³².

Figure 35: A lookout

Figure 36: A bed

Figure 37: A seat or a lounge

Figure 38: A couch

Size vs. Scale: ... or how to inhabit a stair

Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p237. Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. pp57-58. CIBSE. (2005). *Transportation systems in buildings, CIBSE guide D, 3rd ed.* p2-6. Templer, J.A. (1992). *The staircase: histories and theories*. p7. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p49. Losantos, A. (2006). *Stair design*. p4.

³²⁶ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp99- 101. Cullen, G. (1969). *The concise Townscape*. p79. Goldberger, P. (2009). *Why architecture matters*. p154.

³²⁷ Licklider, H. (1965). *Architectural scale*. pp76-77., 90-91.

³²⁸ Licklider, H. (1965). *Architectural scale*. pp63-64.. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp74. Goldberger, P. (2009). *Why architecture matters*. p140.

³²⁹ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp98-101.

³³⁰ Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. p48. Allen, E. (2005). *How buildings work: the natural order of architecture*. p10.

³³¹ Goldberger, P. (2009). *Why architecture matters*. p140.

³³² Cullen, G. (1969). *The concise Townscape*. p79. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp99, 101.

1.1.13 Back Down to Earth: Spatial Relations(hips)

if anything is described by an architectural plan, it is the nature of human relationships, since the elements whose trace it records, walls, doors, windows and stairs are employed first to divide and then selectively to reunite inhabited space³³³.

The complexity of a building's plan, the number of storeys it possesses, the financial position of its owner, their social position and gender, the members of their household, their respective statuses; these are all things that may, and have for several centuries, influenced the manner in which circulation, and therefore stairs, may be implemented within a building³³⁴. There is good reason then for Robin Evans, in his book *Translations from drawings to buildings and other essays*, to take exception to the notion that there is anything ordinary about the nature of and justification for domestic architecture³³⁵. He ventures that 'the theatrically of the ordinary is nothing but a delusion'. If this is true at is one for the most part that we would appear to participate in quite willingly, and in spite the consequences which Evans describes as being 'it hides the power that the customary arrangement of domestic space exerts over our lives'. The organised nature of our domestic affairs he further explains, did not eventuate by chance but 'has an origin and a purpose'. So if Evans is correct and our historical domestication influences our present day selves, we do not even know this, never mind the reasons why this might be so, and what the stair's role in these affairs might have been.

Anyone wishing to understand the nature of the relationships enjoyed by the occupants of Adolf Loos' (1870-1933) houses and their 'origin and purpose' may have been hard put to determine them from a plan, and it was equally as difficult from their elevations³³⁶. For the most part we are accustomed to the levels (floors) in our buildings being regular, clearly defined, and very visibly so, even from the exterior³³⁷. Even if, as is more frequently the case with residential buildings, the exterior is not transparent, the regular placement, conventional

proportions and size of windows and doors – and steps - relative to our own bodies, orients our understanding of the interior that resides within³³⁸. This expectation that the exterior and interior of a building will be simultaneously coherent to us has been a long standing tradition of architecture³³⁹. Loos radical designs however frequently startled and not infrequently baffled the more conservative residents and city councils of the locations within which they were situated, in Vienna and Prague³⁴⁰.

Neighbours who were accustomed to more cheerfully traditional (and unabashedly florid) sights - especially given the preference for the more decorative style of the Vienna Succession (founded in 1897) at the time - were unprepared for the severity of a vista comprising one of Loo's unarguably present yet imperturbably unreadable, asymmetric, apparently randomly floored and windowed, flat-roofed, concrete constructions³⁴¹. The apparent irregularity, illegibility and indifference of these creations to their genteelly conservative neighbourhoods was most discomforting to a European populace accustomed to a more architecturally effusive and engaging style and conventionally 'readable' language that was designed to please its onlookers as much as its inhabitants³⁴².

Council bureaucrats on the other hand were generally less concerned with the (external) appearance of Loos' propositions (strange though they might be), due to being more preoccupied with his seemingly guileless but nonetheless frequent and exceptionally thorough disregard for their planning restrictions. Unused to being presented with illegible paperwork documenting highly unusual, oddly evasive and apparently impossible spatial contortions (which often appeared to pay no attention to anything as mundane as story

³³⁸ Lethen, H. (2006). Between the Barrier and the Sieve: Finding the Border in the Modern Movement. In Madge, J. and Peckham, A. (Ed[s.]), *Narrating architecture: a retrospective anthology*. (pp162-13). Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p40, 42. Exner, U. and Pressel, D. (2009). *Spatial Design*. p37.

³³⁹ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p39. Pelletier, L. (2006). *Architecture in words: theatre, language and the sensuous space of architecture*. pp17-18, 22. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. p164. Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. pp202-205.

³⁴⁰ Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. p39. Tournikiotis, P. (1994). *Adolf Loos*. p59. Goldberger, P. (2009). *Why architecture matters*. p130. Bock, R. (2007). *Adolf Loos: works and projects*. 39.

³⁴¹ Harries, K. (2000). *The ethical function of architecture*. p32. Harbison, R. (2009). *Travels in the history of architecture*. pp221-222. Tournikiotis, P. and A. Loos (1994). *Adolf Loos*. pp59, 92. Lustenberger, K. (1994). *Adolf Loos*. p160. Gravagnuolo, B. (1988). *Adolf Loos: theory and works*. p201. Harbison, R. (2009). *Travels in the history of architecture*. p221. Bock, R. (2007). *Adolf Loos: works and projects*. p39. Zanco, F. [Ed.] (2001). *Luis Barragan: the quiet revolution*. p60.

³⁴² Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. p39. Harries, K. (2000). *The ethical function of architecture*. pp33-34, 47. Mallgrave, H.F. (2005). *Modern architectural theory: a historical survey, 1673-1968*. pp216, 218. Sennott, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. p16. Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. pp42-45. Bock, R. (2007). *Adolf Loos: works and projects*. p39. Tournikiotis, P. (1994). *Adolf Loos*. p17. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. pp33, 35, 274.

³³³ Evans, R. (1997). *Translations from drawings to buildings and other essays*. p56. See also Goldberger, P. (2009). *Why architecture matters*. pp128-129.

³³⁴ Evans, R. (1997). *Translations from drawings to buildings and other essays*. 56-57, 64-65. Rybczynski, W. (1986). *Home a short history of an idea*. pp37, 41, 66, 87-88, 108, 110, 165. Rosner, V. (2005). *Modernism and the architecture of private life*. pp63-64, 71. Rice, C. (2007). *Emergence of the interior: architecture, domesticity, modernity*. pp63, 73. Goldberger, P. (2009). *Why architecture matters*. p129.

³³⁵ Evans, R. (1997). *Translations from drawings to buildings and other essays*. pp5-6.

³³⁶ Goldberger, P. (2009). *Why architecture matters*. p130.

³³⁷ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p38. Hatton, B. (2006). The Problem of Our Walls. In Madge, J. and Peckham, A. (Ed[s.]), *Narrating architecture: a retrospective anthology* (p181). Lethen, H. (2006). Between the Barrier and the Sieve: Finding the Border in the Modern Movement. In Madge, J. and Peckham, A. (Ed[s.]), *Narrating architecture: a retrospective anthology*. (p165).

restrictions), officials frequently responded to Loos applications first with consternation, then with objections and finally the denial of permits, an outcome which caused some of his projects to last for several years as various compromises were slowly negotiated³⁴³. Although such battles were an on-going source of stress for Loos, for the most part he was eventually able to overcome them while maintaining his principles, and some of his most ingenious spatial machinations were formulated in response to these rejections and significant constraints imposed by building authorities³⁴⁴.

The reason for the consternation Loos' designs frequently evoked in residents and councillors alike (or at least one of them) was firmly lodged in his convictions that space should not be treated as surface but as volume³⁴⁵. As such, when examining his clients requirements he began not in terms of examining their horizontal dimensions, but their depth and height, and critically, their vertical positioning with regard to one another³⁴⁶. As a consequence, his interiors became a multitude of split levels of various heights and depths according to their function and level of importance, which he would then weave into a total, fluid manipulation of space to ensure that proximity and distance, the private and the social, intimacy and confluence, ebbed and flowed throughout the house in an intermingling of circulation and placement³⁴⁷. Although the principle / intention of building to a plan of volumes might seem simple and unremarkable, the process and end-results of that process were generally anything but (hence the confusion they generated) and Loos was to devote a lifetime to the gradual acceptance, exploration and refinement of the notion³⁴⁸. The assurity with which he came to manipulate his often baffling paper creations into spatial existence belied the intense devotion that went into their development and radical nature³⁴⁹.

³⁴³ Gravagnuolo, B. (1988). *Adolf Loos: theory and works*. p201. Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. pp27, 34, 56. Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. pp27, 56. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p269. Bock, R. (2007). *Adolf Loos: works and projects*. p39.

³⁴⁴ Bock, R. (2007). *Adolf Loos: works and projects*. p39.

³⁴⁵ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p38. Kruft, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. pp364-365. Lustenberger, K. (1994). *Adolf Loos*. p36. Tournikiotis, P. (1994). *Adolf Loos*. p70.

³⁴⁶ Risselada, M. (1988). *Raumplan versus plan libre: Adolf Loos and Le Corbusier, 1919-1930*. pp78-79. Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. pp139-140. Bock, R. (2007). *Adolf Loos: works and projects*. p77.

³⁴⁷ Kruft, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. p365. Lustenberger, K. (1994). *Adolf Loos*. p37.

³⁴⁸ Tournikiotis, P. (1994). *Adolf Loos*. p59. Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p38. Lustenberger, K. (1994). *Adolf Loos*. p35. Kruft, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. pp364-365. Risselada, M. (1988). *Raumplan versus plan libre: Adolf Loos and Le Corbusier, 1919-1930*. p27. Bock, R. (2007). *Adolf Loos: works and projects*. p77.

³⁴⁹ Bock, R. (2007). *Adolf Loos: works and projects*. p11, 90. Sennot, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. p166. Risselada, M. (1988). *Raumplan versus plan libre: Adolf Loos and Le Corbusier, 1919-1930*. pp78-79. Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. p39.

Figure 39: Villa Skywa Primavesi, Vienna, 1913-15, by Josef Hoffman

Figure 40: Villa Scheu, Vienna, Austria, 1912-1913, by Adolf Loos

Josef Hoffman's Villa Skywa Primavesi exemplifies the ornamental approach to architecture favoured by the Vienna Succession, to which Loos did not subscribe.

1.1.14 Artistic Licence and Mathematical Mayhem: Infinitely Curious

If architects such as Adolf Loos could imagine three dimensional relationships that then (irritatingly for some) appeared to rebel wilfully against the confines of two dimensional ready reckoning, it has long been the delight of artists to circumvent their two dimensional domains by depicting three³⁵⁰. The subject of representation and the appropriation of the stair as representative device and symbol in art (in fact arts; including literature, poetry, film and sculpture) is a thesis in itself³⁵¹. Frequently, the stair – or rather its representation, has been used in such media to convey much the same messages as it's three dimensional counterpoints, for example ascension (towards the divine) is good, or descent (to the underworld) is bad³⁵². However, interesting subversions of this trend include the architect-artist Giovanni Battista Piranesi's Series *Carceri d'invenzione* (*Imaginary Prisons*), Rachel Whiteread's staircase casts and a number of M. C Escher's lithographs, all of which challenge our expectations by reversing notions that we typically associate with the stair³⁵³. In the *Carceri* Piranesi portrayed multiple scenes of malevolent, cavernous cellars, arches and vaults through which stairs, swings and drawbridges entwine and disappear ever upwards, not to the expected relief of light and release however, but instead into indiscernible, horrible gloom, to create nightmare vistas that appear to have more in common with the agony of hell and eternal punishment than ascension towards divine reward³⁵⁴. And although not macabre, an uneasy sensation of disquiet permeates several of M. C Escher's lithographs in which mysterious, silent figures trudge eternally up (or down?) never ending staircases based upon the impossible mathematical figure of the Penrose Triangle, or as in the case of *House of stairs*, peculiarly curly multi-legged creatures march and roll their way adamantly, with relentless intent, through a dizzying labyrinth of ledges stairs and archways with no visible beginning and possibly no end, *for no apparent reason*³⁵⁵. These endless, infinite creations reflect the preoccupation of both mathematicians and artists alike with the vastness of the unknown and the possibly unknowable natures of space and time, or as Vincent Van Gogh (1853-1890) termed it, 'the *vertigo* of the infinite'³⁵⁶.

³⁵⁰ Potie, P. (2008). Sophisticated Geometry in Baroque Composition. In Carpo, M. and Lemerle, F. [Ed.s]. *Perspective, projections and design technologies of architectural representation*. (pp106, 110).

³⁵¹ Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. pp85-90. Million A. H. (1994). Models in Renaissance Architecture. In Million, A. H. [Ed.] *Italian Renaissance architecture from Brunelleschi to Michelangelo*. ppx.

³⁵² See pages 37- 39.

³⁵³ Townsend, C. (2004). *The Art of Rachel Whiteread*. pp96, 100

³⁵⁴ Vidler, A. (1992). *The architectural uncanny: essays in the modern unhome*. p30.

³⁵⁵ Schattschneider, D. and Emmer, M. [Ed.s] (1998). M.C. Escher's Legacy: A centennial Celebration. Col lection of articles coming from the M.C Escher Centennial Conference, Rome. pp12, 28, 113, 132, 134, 269, 236, 275, 283.

³⁵⁶ Maor, E. (1991). *To infinity and beyond: a cultural history of the infinite*. ppviii, 2, 137.

Figure 41: Carceri, plate VII, the drawbridge, Giovanni Battista Piranesi (1720-1778)

Figure 43: Stairs, mixed media, 2001, by Rachel Whiteread (b.1963)

Figure 42: House of stairs, lithograph, 1951, by M. C. Escher (1898-1972)

If Van Gogh, who suffered from a lifetime of mental illness, was all too aware of the terrors of infinity to which the human mind could fall prey, this has been a fate shared by a number of mathematicians who spent their lives trying to comprehend its nature; as one of them – John Edensor Littlewood (1885-1977) – noted 'mathematics is a dangerous profession; an appreciable proportion of us goes mad'. If a page of mathematical formulae regarding the nature of space and time means little to the layperson, the sight of Escher's *House of stairs*, in which both have been confined to the page but somehow, incomprehensibly, been made infinite and escaped it also, is an uncomfortably uncompromising reminder that some things, really *are*, infinitely curious³⁵⁷.

³⁵⁷ Pickover, C. A. (2005). *A passion for mathematics: numbers, puzzles, madness, religion, and the quest*

1.1.15 Cumulatively Curious

This far, the historical analysis and investigation has examined issues related to the development of the stair in particular and buildings and architecture in general, and the wider concepts with which we now associate these, including height, spirituality, scale, time and the body. It has been seen that the stair has become an entity with which we have a complex relationship of numerous, conflicting poetic ideals, desires, fantasies and fears and practical, physical requirements and expectations. Our opposing demands and treatments, both deliberate and unconscious, of it as built construction and architectural entity have led to an extreme, paradoxical polarisation of its nature, as a result of which, it has lost architectural identity and now resides in an indeterminate existence with regards to architectural issues. The confusion and intricacy of this relationship will now be examined in greater detail.

The next section of the historical analysis, Chapter 2, investigates the treatment of the stair from ancient eras to the Renaissance; its development from the profane to the sacred and monumental, the emergence of the pragmatic-poetic divide, the use of the hidden helical stair in the Medieval gothic cathedral, the oddity of Michelangelo's Mannerist Laurentian Library Stair and Alberti's instruction as to the tactical management of Renaissance stairs. Chapter three investigates the development and migration of the grand stair as processional device from the garden, up to the exterior residential façade and into the interior and the social changes and shifts in through that prompted this development and that, led to the appropriation of the stair during the Baroque era as a theatrical means of creating visual spectacle and views. The first half of Chapter 4 examines the troubled relationship between the stair and architecture in the seventeenth and eighteenth centuries and the increasing scientific curiosity and concern of the era as to the practicalities of constructional ergonomics, stair safety and comfort. The development of new materials and construction techniques, the emergence of the skyscraper and the impact of the elevator upon the stair in the nineteenth century are explored. The second half of the chapter explores unusual approaches to the development of design processes and volumetric and sensory spatial principles with regard to twentieth century residential architecture and provides case-studies of twenty-first century explorations of the stair as space become habitable place.

1.2 In the Beginning Technology, Gods and a Troublesome Triad

1.2. Incurious Origins – The Logical Ladder

The stair's predecessor, the ladder, is an old technology that has existed since prehistoric times. The very oldest forms, notched logs or interwoven tree branches, are still used today showing that the original purpose of the stair – to enable vertical access – remains unchanged³⁵⁸. The separation of dwelling and ground that occasioned their introduction was a logical response to the basic, everyday need to defend against humans or animals and the vagaries of climate and nature³⁵⁹. Communities around the world continue to live in this manner today, elevated above water, jungle, swamp and flood plains³⁶⁰.

Figure 44: City of Yawngnwe in the Inle Lake, Heho, Burma

³⁵⁸ Templer, J. A. (1992). *The staircase: history and theories*. ppix-x. Baldon, C. and Melchior, I. (1989). *Steps & stairways*. p13. Braun, M. (2008). *Stairs: architectural details*. p7. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p92.

³⁵⁹ Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p3. Templer, J. A. (1992). *The staircase: history and theories*. p14. Baldon, C., I. Melchior, et al. (1989). *Steps & stairways*. p13.

³⁶⁰ Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p23. Oliver, P. (2006). *Built to meet needs*. p34. Exner, U. and Pressel, D. (2009). *Spatial Design*. p39. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p5. Templer, J. A. (1992). *The staircase: history and theories*. pp14-15.

Whilst undoubtedly advantageous, being simple to construct, light, and easily portable, a ladder or climbing pole may also prove awkward in some circumstances, for some people³⁶¹. Anyone infirm, injured, impaired, very young or very old may be incapable of using it. Even for those without some impediment, the steepness required of a ladder in order to use it efficiently means that hands and arms are required, limiting what can easily be carried³⁶². Instability may also preclude easy / safe use. Additionally a ladder must be descended backwards, which is not a natural movement for humans and which can lead to injury in itself³⁶³. Where portability and lightness were not required, and stability, increased safety and ease of access were, stairs began to emerge. The hillside settlement of Catal Huyuk (Anatolia, 6000BC) comprises a closely-packed huddle of stepped, flat roofed dwellings, through which exterior and interior stairs and ladders provide access to the roofs, thereby extending the occupants' functional areas³⁶⁴. That the sanctuaries of the settlement contain stepped levels also, while the dwellings do not, indicates that what could have originally been devised with everyday functionality in mind, was appropriated for symbolic / sociocultural purposes. It would seem then that in addition to facilitating practical, everyday matters, the stair's potential for affecting *experience*, had been identified and deliberately incorporated as an architectural device at a relatively early stage of humanity's endeavours to build habitats³⁶⁵.

1.2.2 Monumental Mesopotamia

Whilst other cultures made use of the stair to fulfil practical needs relatively early on - such as the Romans in Herculaneum during the sixth century BCE for the interiors and exteriors of their multi storied dwellings (some as high as 5 stories) and in Ostia Oa Antica in 4000BCE³⁶⁶ and the Greeks' use of steps on the steep streets of Cretan Gournia in 3000BCE - from 6000–1000BCE the Mesopotamians had begun to appropriate the stair to construct vast ziggurats

also³⁶⁷. Unlike the purely functional stairs found within the era's double storied mud-brick dwellings, those of the ziggurats were both functional and spiritual, providing sanctuary alters and platforms for astronomical study at their apexes (an equanimitous combination of spirituality and science that has existed more or less happily never after ever since)³⁶⁸. Various arrangements of ramps and monumental stairways, straight and spiral, provided a highly contrived, ceremonial ascent, at a grand scale, but also were designed to invite the gods' descent³⁶⁹. The extreme scale, complexity and intricacy of these constructions highlighted the disparity between the use of the stair to fulfil functional, everyday living needs and their use to create and afford experiential grandeur to the spiritual and scientific. It was a dramatic departure – the first known - from the use of the stair as a purely functional tool to its facilitation of spiritual and scientific experience, through the investing of the staircase with an intense level of conceptual meaning and exceptional scale³⁷⁰.

The inhabitants of Mesopotamia, the Sumerians, Chaldeans, Babylonians and Assyrians, although forerunners, were not alone in this appropriation of the stair for socio-cultural purposes; over time, other cultures also followed suit. The pyramid tombs (2550-2460 BCE) of Egypt incorporate both ramped and stepped passageways, while the temples of the Middle and New Kingdoms (2020–1500 BCE) include exterior and interior stairways, formed as a deliberate hierarchy³⁷¹. The great cultures of Anatolia, Palestine, Persia, Crete, Mycenaean and Hellenic Greece, Rome, the Aztecs, Mayans and Incas, the Toltec and Ionian civilisations, and even those of the great dynasties of China and Tibet, which emphasised the horizontal rather than the vertical, all demonstrated an affinity for the formal and monumental stair in their temples, castles, sanctuaries and palaces, and the practical and functional in their ordinary dwellings and settlements³⁷². Even despite differences in culture, common associations began to emerge. That which was sacred was deliberately elevated above the everyday realm and was frequently also huge, extravagant and grandiose in appearance³⁷³. The commonplace

³⁶¹ Allen, E. (2005). *How buildings work: the natural order of architecture*. pp163-164. Templer, J. A. (1992). *The staircase: history and theories*. pp18-19. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p60.
³⁶² Templer, J. A. (1992). *The staircase: history and theories*. p18. Allen, E. (2005). *How buildings work: the natural order of architecture*. pp163-164.
³⁶³ Bergera, S.E. Theuring, C. and Adolph, K.E. (2007). *How and when infants learn to climb stairs*. p46. Cluffa, T. and Robertson, D. G. E. (2011). *Kinetic analysis of stair descent: Part 1. Forwards step-over-step descent*. pp423-428. Templer, J. A. (1992). *The staircase : history and theories*. p18, 212, 223.
³⁶⁴ Habermann, K. J. (2003). *Staircases: design and construction*. p10. Porsolt, D. I. V. (1981). *The history and design of vertical communication*. p1. Farrelly, L. (2007). *The fundamentals of architecture*. p38. Kostof, S. (1995). *A history of architecture: settings and rituals*. p50. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p9.
³⁶⁵ Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p19. Porsolt, D. I. V. (1981). *The history and design of vertical communication*. p1. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. pp36-37. Kostof, S. (1995). *A history of architecture: settings and rituals*. p44.
³⁶⁶ Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p62.

³⁶⁷ Kostof, S. (1995). *A history of architecture: settings and rituals*. p56.
³⁶⁸ Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p35. Templer, J. A. (1992). *The staircase: history and theories*. p37. The word Ziggurat comes from the Assyrian word for 'summit' or 'mountaintop'. Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p17. Einstein, A. (2007). Religion and Science. In Dawkins, R. (Ed.), *The Oxford book of modern science writing* (p238).
³⁶⁹ Kostof, S. (1995). *A history of architecture: settings and rituals*. pp57-58, 62.
³⁷⁰ Porsolt, D. I. V. (1981). *The history and design of vertical communication*. p1.
³⁷¹ Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p24. Kostof, S. (1995). *A history of architecture: settings and rituals*. pp67-71. Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. pp9, 25-26. Ross, L. (2009). *Art and architecture of the world's religions*. p59-60.
³⁷² Porsolt, D. I. V. (1981). *The history and design of vertical communication*. pp1-2. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. pp26, 32-33. Templer, J. A. (1992). *The staircase : history and theories*. p38. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. pp44-45, 16, 166-169, 177-182.
³⁷³ Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp34-35. Kliment, S. A. (2004) *Building type basics for places of worship*. pp11-12, 209. Baldon, C. and Melchior,

was humble in comparison, relegated to the ground plain, simple and merely functional, further emphasising the superiority of the gods and their priests. The architectural devices of the former approach, including that of the monumental or processional stair, were soon appropriated by rulers to express their might to their enemies and ensure their own exaltation in the eyes of their subjects³⁷⁴. Over time, the exaggerated duality between the architecture of the everyday as practical and simple, and that of the monumental, whether sacred or secular, as extravagant and complex, became increasingly pervasive throughout different cultures; use of the stair as *either* monumental device of aggrandisement or functional but disregarded technology of the everyday, was no exception. [

Figure 45: The great ziggurat at Ur, the beginning of monumental architecture and the use of the stair as symbol

1.2.3 Firmness, Commodity and More Commodity? Vitruvian Values – A Curious Contradiction

It would seem logical, given this widespread adoption, adaptation and evolution of the stair from functional technology to socio-cultural mode of expression and experiential spatial tool, that the great early theoreticians and practitioners of architecture would have much to say on the aesthetic appreciations and considerable skills one should possess in order to effect such architecture. Documentation, you might think, in some form or another, would abound. Rather disappointingly, at least for anyone expecting an enjoyably enlightening read, this is not the case. The only thing remarkable about the stair in the early seminal texts on architecture – those for example of Vitruvius, Villard de Honnecourt's Portfolio, Alberti's *De Re Aedificatoria* and Palladio's *Quattro Libri* – is its general absence³⁷⁵.

Vitruvius (80 – 30 BCE), Roman historian and author of the earliest known surviving text on architecture (and only one surviving from classical antiquity), *De Architectura*, (ca. 30 BCE) despite proclaiming (at length) that the absolute fundamentals of any architectural effort must include *Firmitas, Utilitas and Venustus* – structure, function and beauty - did not appear to think it necessary to extend the last to stairs³⁷⁶. He has little to say on domestic stairs, or in fact stairs in general, with the exception of the temple and theatre³⁷⁷. Even here Vitruvius confines himself to documenting his views on the comfort and safety of stairs by prescribing the dimensions and illuminatory requirements most appropriate for the ensurance of safety, ease and comfort, and to noting strategies to ensure that such practical theatrical concerns as good sightlines and ease of performance are effected; but of beauty or other experiential significances beyond the practical necessities however, there is no mention³⁷⁸. This early schism set the scene for a division of architectural attitudes to the stair that has existed – to little concern - ever since.

This apparent lack of interest in the inhabitory or experiential potential of the stair, from a scholar revered as a founding theoretician and exponent of architecture, is more understandable when the wider cultures and architectural practices of early Rome and Greece are considered. The Romans initially afforded little importance to the stair³⁷⁹.

³⁷⁴ I. (1989). *Steps and stairways*. p26.
Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p5. Exner, U. and Pressel, D. (2009). *Spatial Design*. p41. Kostof, S. (1995). *A history of architecture: settings and rituals*. pp18-19.

³⁷⁵ Templer, J. A. (1992). *The staircase: history and theories*. ppix, 44. Patterson, R. (2006). What Vitruvius said. In Madge, J. and Peckham, A. (Ed[s].), *Narrating architecture: a retrospective anthology*. (p341-359).

³⁷⁶ Kostof, S. (1995). *A history of architecture: settings and rituals*. pp13, 28. Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p1.

³⁷⁷ Templer, J. A. (1992). *The staircase: history and theories*. p23. Habermann, K. J. (2003). *Staircases: design and construction*. p20.

³⁷⁸ Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p14.

³⁷⁹ Spens, M. (1995). *Staircases: Detail in Building*. p7.

Important rooms were situated on the ground floor of a building, so the stair was simply a device that enabled the connection and use of vertical space of lesser importance³⁸⁰. In this context, the stair was treated in a very mundane fashion and was not conceived of as being architectural or as contributing to experience in itself³⁸¹. The adoption of the monumental stair by the Romans, to create approach was a far later development. The stair was also unimportant to early Greek culture. Interior stairs were plain and functional; their only purpose was to enable access to galleries above³⁸². Temple approaches were generally designed as simple, winding paths; it was the site and its height that was important, not the means of getting to it³⁸³. It was not until the post-Alexandrian Hellenistic period (323 BC - AD 300) that, influenced by conquestory travels within Asia by Alexander the Great (356-323 BCE) that the Greeks conceived of stairs as affording monumentality, significance and as being of architecture in the sense of creating, enabling and manipulating experience of space³⁸⁴.

1.2.4 Technical Tricks: Gothic Mastery and Dizzy Heights

The helical stair had been mentioned in the Old Testament as early as early as 970 BCE and been adopted by the Romans in the second century but it appears that with the exception of its use for victory columns such as Trajan's Column in Rome, for the most part it was generally regarded by them as a space saving device³⁸⁵. The refinement of the stair as an already extant, useful tool, from a straight flight to a helix, maintained the purpose and advantage of creating and accessing vertical space while minimising the disadvantage, the amount of (horizontal) space required to do so³⁸⁶. In European castle architecting and building of the tenth century onwards however (a frequent activity owing to the rather turbulent nature of the times), helical stairs could be en-towered comparatively easily, and thus became very useful as defence mechanisms; protected lookouts and firing ranges³⁸⁷. In the standard form of the

helical stair of this time, each step was built into the wall that enclosed it, with the round haft at the centre of each stacking upon the one below, to become the central shaft³⁸⁸. The stairs were usually kept very deliberately narrow so as to prevent mass onslaught by invaders and enable the tower's defence by one man³⁸⁹. But whether exterior or interior, entowered or empasaged, helical or straight, the stairs themselves tended to be very plain; they existed after all merely to effect purpose – primarily the provision of height so as to enable military / defensive advantage - so were not required to be of great interest, rather, great practical efficacy³⁹⁰. Although the stairs were originally of wood, stone quickly became the favoured material. Whilst more awkward and costly to obtain and transport, stone was, unlike wood, wonderfully *fireproof*, a great benefit given that offensive military tactics of the times included setting structures alight³⁹¹. Unfortunately stone generally remained the province of the rich (including the church) at this time, while timber, cob, mud, wattle, daub and thatch remained the building materials for the poor, whose houses frequently burned down as a result³⁹².

A helical stair is a trickier matter technically than a straight stair, but this did not deter the ecclesiastical leaders of the early middle ages from realising that it could be very useful in aiding their service to God. The prevailing religious desire of the time was to easily communicate the supremacy of God to the (essentially illiterate) masses³⁹³. From the twelfth century onwards this was achieved by the development of a unique building form that, even while it remained reliant upon stone, both reduced and re-positioned structural mass to enable the provision of vastly enlarged (from anything previously extant) stained glass windows that allowed the soaring, vaulted interior to be illuminated with the divine Lux (*light*) of creation; the sacred message and glory of God³⁹⁴. This new style, later termed Gothic by disdainful Italian humanists of the early fifteenth century (the label was one of contempt for what was considered to be a crude and rustic approach, as epitomised by the

³⁸⁰ Palmer, A. L. (2008). *Historical Dictionary of Architecture*. pxx. Kostof, S. (1995). *A history of architecture: settings and rituals*. p14.
³⁸¹ Templer, J. A. (1992). *The staircase: history and theories*. p120. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p24. Farrelly, L. (2007). *The fundamentals of architecture*. p44. Gwilt, J. (1842). *An encyclopaedia of architecture: historical, theoretical, and practical*. p763.
³⁸² Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p24.
³⁸³ Templer, J. A. (1992). *The staircase: history and theories*. p120. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p24. Ross, L. (2009). *Art and architecture of the world's religions*. p80.
³⁸⁴ Farrelly, L. (2007). *The fundamentals of architecture*. p44. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p24.
³⁸⁵ Palladio, A., Tavernor, R. and Schofield, R. [Trans.s]. (2002). *The four books on architecture*. p67. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p26. Templer, J. A. (1992). *The staircase: histories and theories*. p53.
³⁸⁶ Templer, J. A. (1992). *The staircase: history and theories*. p54.
³⁸⁷ Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p203. LePage, J-G. G.G. (2002). *Castles and fortified cities of medieval Europe: an illustrated history*. pp28, 52. *The Routledge companion to medieval warfare*. p295

³⁸⁸ LePage, J-G. G.G. (2002). *Castles and fortified cities of medieval Europe: an illustrated history*. p134. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp18, 152. Godfrey, W. H. (1910). *The English staircase: an historical account of its characteristic types to the end of the eighteenth century*. p8.
³⁸⁹ LePage, J-G. G.G. (2002). *Castles and fortified cities of medieval Europe: an illustrated history*. p108.
³⁹⁰ Templer, J. A. (1992). *The staircase: history and theories*. p54. Eco U. (2004). *On beauty*. p106.
³⁹¹ Godfrey, W. H. (1910). *The English staircase: an historical account of its characteristic types to the end of the eighteenth century*. p9. LePage, J-G. G.G. (2002). *Castles and fortified cities of medieval Europe: an illustrated history*. p286. Crabtree, P. J. [Ed.] (2008). *Encyclopedia of society and culture in the medieval world*. p76. Templer, J. A. (1992). *The staircase: history and theories*. p16.
³⁹² Crabtree, P. J. [Ed.] (2008). *Encyclopedia of society and culture in the medieval world*. p75.
³⁹³ Farrelly, L. (2007). *The fundamentals of architecture*. p46.
³⁹⁴ Kieckhefer, R. (2004). *Theology in Stone: church architecture from Byzantium to Berkeley*. pp107-108. Ball, P. (2009). *Universe of stone: a biography of Chartres cathedral*. p239-240, 246. Toman, R. (1998). *Baroque: architecture, sculpture painting*. pp8, 16, 28. Eco, U. (2004). *On Beauty*. pp102, 104, 126, 129. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p77. Farrelly, L. (2007). *The fundamentals of architecture*. p46. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp363-364. Wigginton, M. (1996). *Glass in architecture*. p15-16. Turnbull, D. (2000). *Masons, tricksters and cartographers: comparative studies in the sociology of scientific and indigenous knowledge*. p59. Harries, K. (2000). *The ethical function of architecture*. p109.

Goths, a 'barbaric' tribe of Northern Europe), was begun by the rebuilding of the Abbey of Saint-Denis in France from 1137-1144 by the Abbot Suger (1081-1151) as documented in his treatise *Liber de Rebus in Administratione Sua Gestis*, or, *On his administration* (it was normal practice for monks and priests to design and oversee the construction of their churches at this time³⁹⁵). The technical trickery that the Abbot Suger's (and most subsequent) builders resorted to in order to achieve these exquisite interiors of space and lightness involved the use of the pointed rather than rounded arch - the ogive - the flying buttress and the pinnacle³⁹⁶. Collectively these techniques also emphasised the vertical and directed the eyes upwards, reinforcing the message of the glory of God, the gulf between man and God, and the worthiness of an aspiration of ascent to the purity of His realm in the heavens (as opposed to the less than glorious life of filth and disease that frequently prevailed upon the distinctly unheavenly ground)³⁹⁷.

This direction of the gaze vertically to the heavens and thus the divine was frequently reinforced even further by the provision of towers³⁹⁸. The towers, whether for the housing of bells to call the masses to prayer or signal celebration and / or to provide service as defensive lookout in times of unrest, were then often further adorned with teetering spires, turrets and pinnacles³⁹⁹. The last did actually perform a structural role though, their mass contributing to the stabilisation of the walls and pillars beneath them⁴⁰⁰. In addition to the towers' practical functions and aside from their symbolic meaning (the Virgin Mary) to their religious clients, they were also intended to convey other messages⁴⁰¹. Their visibility ensured that to their immediate community they were a perpetual reminder of the rightful, Godly, focus of all

human concern and a call to collective fellowship and worship (the penalty for forgetfulness of either activity then being equally perpetual damnation it was worth being perpetually reminded); and slightly less nobly, to surrounding communities and cities the towers were the means of effecting an ecclesiastical superiority contest – a kind of vertical duel-off – the reasoning being that that the taller the spire, the more pious the city⁴⁰².

Figure 46: View of Strasbourg, France, c. 1490, woodcut from the folio of Hartmann Schedel (fol. Cxxxix and cxl recto.). The profusion of towers demonstrates the preoccupation with height.

Figure 47: Chartres Cathedral, Paris, France. Constructed between 1194 and 1250, the cathedral contains nine vises

³⁹⁵ Rudolph, R. [Ed.] (2006). *A companion to medieval art: Romanesque and Gothic in northern Europe*. pp384-385. Crabtree, P. J. [Ed.] (2008). *Encyclopedia of society and culture in the medieval world*. pp72-74. Rybczynski, W. (2001). *The look of architecture*. p52. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp363-364. Wigginton, M. (1996). *Glass in architecture*. p15. Turnbull, D. (2000). *Masons, tricksters and cartographers: comparative studies in the sociology of scientific and indigenous knowledge*. pp58-59.

³⁹⁶ Kieckhefer, R. (2004). *Theology in Stone: church architecture from Byzantium to Berkeley*. pp109, 116. Crabtree, P. J. [Ed.] (2008). *Encyclopedia of society and culture in the medieval world*. p75. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. p362.

³⁹⁷ Farrelly, L. (2007). *The fundamentals of architecture*. p46. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. pp73, 77. LePage, J-G. G.G. (2002). *Castles and fortified cities of medieval Europe: an illustrated history*. pp54-55, 282, 291, 295. Kieckhefer, R. (2004). *Theology in Stone: church architecture from Byzantium to Berkeley*. pp13, 104-107, 113-114. Crabtree, P. J. [Ed.] (2008). *Encyclopedia of society and culture in the medieval world*. p75. Padovan, R. (1999). *Proportion science philosophy architecture*. p242. Harries, K. (2000). *The ethical function of architecture*. pp187, 215.

³⁹⁸ Harries, K. (2000). *The ethical function of architecture*. pp183-184. Smith, T. (1884). *Architecture: gothic and Renaissance*. pp77-82.

³⁹⁹ Smith, T. (1884). *Architecture: gothic and Renaissance*. pp77-82.

⁴⁰⁰ Farrelly, L. (2007). *The fundamentals of architecture*. p46. Kieckhefer, R. (2004). *Theology in Stone: church architecture from Byzantium to Berkeley*. p104. Ball, P. (2009). *Universe of stone: a biography of Chartres cathedral*. p205. Turnbull, D. (1993). *The ad hoc collective work of building gothic cathedrals with templates, string, and geometry*. p325.

⁴⁰¹ Bandmann, G. and Wallis, K. (2003). *Early medieval architecture as bearer of meaning*. p44.

⁴⁰² Farrelly, L. (2007). *The fundamentals of architecture*. p46. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p74. Harries, K. (2000). *The ethical function of architecture*. pp184, 186.

No matter how lofty or pious or otherwise, the dizzying heights of all of these vertiginous creations - and they were dizzying, the spire of Strasbourg Cathedral (completed in 1439) is a hundred and forty-two meters tall - required access; first in their building, although this was initially achieved by the use of wooden scaffold, and then when complete, to enable access to the church bells, to effect repairs and to maintain lookout in event of any civic unrest (it being very usual for religious buildings to also serve duty as fortresses from the ninth to twelfth centuries)⁴⁰³. In Chartres Cathedral (begun in 1194 and completed in 1250), the masons cunningly innovated a manner of permanent, inbuilt scaffolding, a furtive network of stone passageways that weave through the building's upper levels⁴⁰⁴. To reach these sky-warrens, the masons built vices - spiral staircases - nine in total⁴⁰⁵. Remote heights of the building could thus remain accessible to clerics and builders alike but the helical stair, despite being an effector of these lofty elevations, remained hidden from sight. Concealed in corners, within towers, the bulk of a buttress or the imperturbable density of some other undeterminable mass, doors secreted, presence muted, the stair was an invisible mechanism within the greater device, the compacted tightness of its spiral effecting its denial within impenetrable layers of masonry, density and time⁴⁰⁶. It was a ghost, no too-obvious-plot, a *deus ex machina*, quite the opposite in fact, rather it was rather a machine in God; God in the heights of His heavens made manifest on earth, the stair hidden within, silent servant to the soul⁴⁰⁷.

Figure 48: Chartres west tower helical stair

Figure 49: Chartres cathedral plan, the vices are hidden away

The conception and execution of the many marvellous intricacies involved in this devoted crafting of architecture for the glory of God - whether visible or not and concerning stairs or not - required considerable technical virtuosity and understanding. There was however no profession of 'architect' or 'engineer' at this time, no school or academy at which such things could be learned, no textbooks, or codes to turn to for accumulated knowledge and guidance⁴⁰⁸. The accomplishing of the great Gothic cathedrals, churches and monasteries of the Middle Ages could not have occurred until the craft guilds had begun to form in the late eleventh century in response to the increased desire of the land hungry nobility for their fortified castles, and begun to acquire the necessary knowledge⁴⁰⁹. At first these networks were informal and voluntary, a loose gathering of workers in like trades who would come together to pool finances, to obtain materials and work, to pray and sometimes journey together in search of work, but over time, they became more formal⁴¹⁰. By the fourteenth century the guilds had become so well established that they were managing the control, practice and regulation of the crafts themselves⁴¹¹.

Part of this last involved the training of young craftsman, a process which became over time, a system of apprenticeship, *Compagnonnage* as it was called in France⁴¹². Apprenticeship would typically last for seven years. The apprentice would live with and serve a master (in the sense of a full member of a guild although the term was also confusingly used in England for any builder who was a mason or carpenter), learning from him either carpentry or masonry or both, whilst working on architectural projects alongside other master builders⁴¹³. As their learning progressed, the apprentice would be taught mathematics, how to design construction details and plan elevations and the skills of *l'art du trait*, the use of applied mathematics and the instruments necessary to master geometry⁴¹⁴. It was through geometrical methods the medieval masters would endeavour to calculate the structural stability required for the transference of two dimensional ideas to three dimensional strength of form and guide their apprentices from design to execution (structure and construction)⁴¹⁵.

⁴⁰⁸ Kostof, S. (1977). *The architect: chapters in the history of the profession*. pp96, 121.

⁴⁰⁹ Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p85. LePage, J-G. G.G. (2002). *Castles and fortified cities of medieval Europe: an illustrated history*. pp28, 52, 108, 286.

⁴¹⁰ Kostof, S. (1977). *The architect: chapters in the history of the profession*. p121.

⁴¹¹ Ball, P. (2009). *Universe of stone: a biography of Chartres cathedral*. p266. Turnbull, D. (1993). *The ad hoc collective work of building gothic cathedrals with templates, string, and geometry*. p329.

⁴¹² LePage, J-G. G.G. (2002). *Castles and fortified cities of medieval Europe: an illustrated history*. p133.

⁴¹³ Toker, F. (1985). *Gothic architecture by remote control: an illustrated building contract of 1340*. p67.

⁴¹⁴ Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. pp85-90. Ball, P. (2009). *Universe of stone: a biography of Chartres cathedral*. p164. Turnbull, D. (1993). *The ad hoc collective work of building gothic cathedrals with templates, string, and geometry*.p329.

⁴¹⁵ Potie, P. (2008). *Sophisticated Geometry in Baroque Composition*. In Carpo, M. and Lemerle, F. [Ed.s]. *Perspective, projections and design technologies of architectural representation*. (p110).

Rudolph, R. [Ed.] (2006). *A companion to medieval art: Romanesque and Gothic in northern Europe*.

⁴⁰³ Ball, P. (2009). *Universe of stone: a biography of Chartres cathedral*. P196. Ball, P. (2009). *Universe of stone: Chartres cathedral and the invention of the gothic*. pp189-190. LePage, J-G. G.G. (2002). *Castles and fortified cities of medieval Europe: an illustrated history*. pp28-29. Kieckhefer, R. (2004). *Theology in Stone: church architecture from Byzantium to Berkeley*. p106. Ball, P. (2009). *Universe of stone: a biography of Chartres cathedral*. p266-270. Turnbull, D. (2000). *Masons, tricksters and cartographers: comparative studies in the sociology of scientific and indigenous knowledge*. p59.

⁴⁰⁴ Ball, P. (2009). *Universe of stone: Chartres cathedral and the invention of the gothic*. pp189-190.

⁴⁰⁵ Ball, P. (2009). *Universe of stone: Chartres cathedral and the invention of the gothic*. pp189-190.

⁴⁰⁶ Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p215, 221, 228.

⁴⁰⁷ Ball, P. (2009). *Universe of stone: Chartres cathedral and the invention of the gothic*. p268. Harbison, R. (1998). *Thirteen ways: theoretical investigations in architecture*. p37. Templer, J.A. (1992). *The staircase: histories and theories*. p60.

As the guilds and lodges evolved these methods were collated in model or pattern books along with documented examples of good practice and were updated over time⁴¹⁶. This knowledge was jealously guarded however - it was hard won and painstakingly recorded to become a treasury of secrets for dissemination amongst guild members only - and would become a means of distinction between those who were truly skilled and those who could only labour⁴¹⁷. This division would eventually contribute to the separation of the building of architecture from its design, thereby widening the separation that had begun with Vitruvius' division of practice from theory centuries before⁴¹⁸.

One of the best known of these medieval guild figures is Villard de Honnecourt, (ca. 1225-ca.1250) whose small portfolio of drawings commented in Picard and Latin is the earliest known graphic record of architectural and mechanical concepts in post Roman Europe⁴¹⁹. The exact nature of Villard's role continues to be puzzled over however as he was a somewhat indeterminate, enigmatic figure. He has been variously termed mason, master, architect, engineer, builder, artist, artisan, carpenter and craftsman by different people at different times, partly according to the interests of the describer and partly for the breadth of own, which have also seen him labelled the medieval Leonardo da Vinci. His portfolio of thirty-three pages (thought to be a compilation of sketches he made as he travelled throughout Europe from around 1230) contains an eclectic mix of drawings that include mechanical devices, hydraulics, weaponry, tools, statuary, furnishings, timber and stone construction details, plans and elevations (including of stair towers), and, slightly bizarrely, a lion and a porcupine, all in no discernable order⁴²⁰. Whether Villard de Honnecourt's portfolio is entirely representative of the early knowledge of various or any of the guilds or not remains a source of debate (as does the question as to where and how exactly he may have encountered either the porcupine or the lion)⁴²¹. It was however, only through such journeying's and documentations as Villard's (which increased by the end of the 13th century) and the

determined nurturing of skill and knowledge through successive generations of apprentices, that the guilds could develop the technical mastery necessary to accomplish the great vertical heights (including the helical servant-stairs) and transcendently luminous beauty of the gothic cathedrals, through which the divine glory of God and human faith in and devotion to Him could be expressed⁴²². Unfortunately however, although faith in God was infinite, knowledge as to gravity and practical physics was not⁴²³. Collective practical mastery was just not quite sufficient sometimes to ensure that heights, once up, remained up, and collapses were a fairly regular occurrence, especially given that the nobles had joined ecclesiastical leaders in vying for height-linked status⁴²⁴. Unreliable calculation, improvised solutions, faulty tectonics, poor materials, untested construction methods and insufficiently practiced technique were often poor opponents for gravity, bad weather and cantankerous geology (in addition to which fires from lightening periodically consumed crucial timber supports); towers, spires, pinnacles, walls, pillars, vaults, entire churches and cathedrals could and did succumb to the vagaries of natural forces and human error (although at this time such events were more typically ascribed to acts of divine displeasure, possibly due to insufficiently attentive devotion)⁴²⁵. The English cathedrals of Winchester, Gloucester and the church of Beverly Minster and the French cathedral Beauvais all suffered dramatic collapses⁴²⁶. Of the last, the choir vaults of Beauvais reached one hundred and fifty seven feet (47.8m), on completion in 1275, but lasted only twelve years before plummeting to earth; some said as divine reproof for the cathedral's excessive height and size⁴²⁷. Historical scholars debated the cause of the failure – as no doubt did the masons - mortar shrinkage, soil subsidence, inadequate buttressing were all pondered but it is still not known exactly what caused the collapse⁴²⁸. At any rate, the cathedral clerics had the choir repaired and in the fifteenth century a mighty tower was also erected over the crossing, the tip of the spire rising one hundred and forty meters above the ground, until in 1573 it too collapsed.

⁴¹⁶ Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. pp239-240. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p121.
⁴¹⁷ Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. pp85-90. Ball, P. (2009). *Universe of stone: a biography of Chartres cathedral*. p164. Turnbull, D. (1993). *The ad hoc collective work of building gothic cathedrals with templates, string, and geometry*.p329.
⁴¹⁸ Kostof, S. (1977). *The architect: chapters in the history of the profession*. p121, 130-131.
⁴¹⁹ Rudolph, R. [Ed.] (2006). *A companion to medieval art: Romanesque and Gothic in northern Europe*. pp391, 534. Crabtree, P. J. [Ed.] (2008). *Encyclopedia of society and culture in the medieval world*. pp72, 75. Cunningham, L. S. and Reich, J. J. (2009). *Culture and values: a survey of the humanities*. p221.
⁴²⁰ Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p239. Crabtree, P. J. [Ed.] (2008). *Encyclopedia of society and culture in the medieval world*. p72. Rudolph, R. [Ed.] (2006). *A companion to medieval art: Romanesque and Gothic in northern Europe*. p384. Cunningham, L. S. and Reich, J. J. (2009). *Culture and values: a survey of the humanities*. p221. Villard de Honnecourt, Bowie, T. [Ed.] (1959). *The sketchbook of Villard de Honnecourt*. pp74-75.
⁴²¹ Barnes, C.F (2009) *The portfolio of Villard de Honnecourt*.pp169-170.

⁴²² Rudolph, R. [Ed.] (2006). *A companion to medieval art: Romanesque and Gothic in northern Europe*. p384. Smith, T. (1884). *Architecture: gothic and Renaissance*. p35. Turnbull, D. (2000). *Masons, tricksters and cartographers: comparative studies in the sociology of scientific and indigenous knowledge*. p63.
⁴²³ Turnbull, D. (2000). *Masons, tricksters and cartographers: comparative studies in the sociology of scientific and indigenous knowledge*. p55.
⁴²⁴ LePage, J-G. G.G. (2002). *Castles and fortified cities of medieval Europe: an illustrated history*. p133. Kieckhefer, R. (2004). *Theology in Stone: church architecture from Byzantium to Berkeley*. pp33-35, 176, 179, 182, 313.
⁴²⁵ Kieckhefer, R. (2004). *Theology in Stone: church architecture from Byzantium to Berkeley*. p104. LePage, J-G. G.G. (2002). *Castles and fortified cities of medieval Europe: an illustrated history*. p133.
⁴²⁶ Kieckhefer, R. (2004). *Theology in Stone: church architecture from Byzantium to Berkeley*. p176. Smith, T. (1884). *Architecture: gothic and Renaissance*. pp77-82.
⁴²⁷ Harries, K. (2000). *The ethical function of architecture*. p184. Ball, P. (2009). *Universe of stone: a biography of Chartres cathedral*. p232.
⁴²⁸ Ball, P. (2009). *Universe of stone: a biography of Chartres cathedral*. p196, 232.

Although repaired somewhat in 1575 the choir was never fully completed and like many of the great cathedrals of the age it relied upon multiple subsequent repairs to ensure its continued safe standing⁴²⁹.

Figure 50: Tower from the portfolio of Villard-de-Honnecourt.

Figure 52: The lion and the porcupine (de Honnecourt took pains to point out that the lion was 'drawn to life')

Figure 51: Section documenting flying buttress

European architectural documentation was in its infancy in Villard-de-Honnecourt's age, but increasing efforts to formalise practices, codify knowledge and institute guided learning saw its importance increase from then on as the guilds became more organised. The division between those who could only labour, and those who were skilled that had begun with Vitruvius's separation of theory and practice began to widen further.

1.2.5 Helical Journeys - On Leonardo, Lookouts and Lions

Meanwhile, shifts in the domestic dwelling habits of the European nobility had seen the desire for privacy increase. In the grand castles and palaces of the wealthy, living preferences were shifting from a culture of openness and public display to the design of apartments and the grouping of rooms as suites. These apartments or suites could be quite numerous and the stair could be used to facilitate the circulation patterns that were beginning to emerge as connections between rooms on different floors were designed⁴³⁰. As the number of apartments multiplied over time, these machinations could be both quite complicated and space hungry, for which reason the helical stair rather than the straight flight was used, and remained very popular. These stairways continued to be hidden in towers initially but as the expertise of the craft guilds developed, their designers, increasingly well versed in the intricacy and complexity of the stair's crafting, gradually became more expressive, removing the surrounding walls and opening them out to become new spatial experiences and sculptural objects in their own right⁴³¹.

There is much conjecture, occasional assertion and some evidence to suggest that one of the most renowned examples of such stairs – the great stair built by King Francis 1 (1515 – 1525) of France at his castle in Blois – was the devising of Leonardo da Vinci (1452-1519)⁴³². In understanding, concept and execution, individually and in concert, and especially given the prevailing designs of the time which were typically enclosed, narrow and dark, the stair is completely extraordinary, an exceptional interweaving of spatial articulation, tectonic deliberation, attentive detailing and revelatory openness. Any of these aspects alone would have been remarkable and unprecedented, but in combination, are quite extraordinary. The manner in which the view of the user is directed outward rather than inward and the interior is exposed to onlookers outside of it would have been particularly startling, a radical interpretation of the stair in nature and purpose.

⁴²⁹ Kieckhefer, R. (2004). *Theology in Stone: church architecture from Byzantium to Berkeley*. pp3, 36, 109, 116, 144, 198, 257.

⁴³⁰ Cook, T. A. (1903). *Spirals in nature and art: a study of spiral formations based on the manuscripts of Leonardo da Vinci, with special reference to the architecture of the open staircase at Blois, in Touraine, now for the first time shown to be from his designs*. pp9-10. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. pp49-50. Templer, J. A. (1992). *The staircase: history and theories*. pp56-57, 59, 120. LePage, J-G. G.G. (2002). *Castles and fortified cities of medieval Europe: an illustrated history*. p134. Godfrey, W. H. (1910). *The English staircase: an historical account of its characteristic types to the end of the eighteenth century*. pp7, 21.

⁴³¹ Templer, J. A. (1992). *The staircase: history and theories*. p60. Cook, T. A. (1903). *Spirals in nature and art*. pp9-10.

⁴³² Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp18, 23. Templer, J. A. (1992). *The staircase: history and theories*. p60. Spens, M. (1995). *Staircases: Detail in Building*. p7.

The stair at Blois was the antithesis of the way in which stairs had been used and thought about. It was no longer just a functional object intended to enable a specific and very limited service - vertical travel – but was intended to be an event, to provide an experience – a new way of sensing space⁴³³.

Figure 53: The stair at Blois, (1515-1525) for King Francis I; frequently conjectured to be the work of Leonardo da Vinci

Figure 54: The marvellous double helix stair at Chambord, also for King Francis I and also thought to be the work of Leonardo da Vinci, was later documented by Andrea Palladio in his treatise, *I quattro libri dell'architettura* (1570).

Certainly Da Vinci possessed the technical and mechanical understanding necessary to affect such a stair pragmatically while rendering it with such poetry spatially. His notebooks reveal that he had made careful studies of stairs, their juxtaposition next to equally careful diagrams of human blood vessels demonstrating his conception of stairs (in conjunction with doors as valves) as metabolism, a metaphor for the facilitation of movement throughout a building⁴³⁴. He is widely credited as being the first student of biomechanics, attempting to systematically and intensively study human and animal anatomy and the mechanics of movement in great detail, recording the 'mechanics of standing, walking up and downhill, rising from a sitting position and jumping'⁴³⁵. The skilful manipulation of the stair at Blois to create a relationship of such harmony between stair and user, space and form, interior and exterior suggests that an extremely thoroughly understanding of the body, movement and space, such as Da Vinci's studies had given him, would have been necessary to effect such a remarkable solution. According to the historian Giorgio Vasari (1511-1574) in his published work of 1550 *Le Vite de' più eccellenti pittori, scultori, e architettori da Cimabue insino a' tempi nostril* (*Lives of the Most Excellent Italian Painters, Sculptors, and Architects, from Cimabue to Our Times*), Da Vinci had also enjoyed a longstanding relationship with King Francis I before formally taking up his offer of patronage in 1516 and had in fact used his extensive studies of animal anatomy to construct an automata in the form of a lion with which to greet the king's return to Lyon in 1515⁴³⁶. Vassari describes how on presentation to King Francis the automata was able to take a few steps before an aperture in its breast opened to reveal a bunch of flowers, lilies to be precise⁴³⁷. Vassari did not go on to record how this startling apparition may have been received but according to other sources it was apparently with great delight, which is perhaps more understandable to us nowadays when the burgeoning fascination of the era for automata of all sorts, shapes and sizes is appreciated⁴³⁸.

⁴³³ Templer, J. A. (1992). *The staircase: history and theories*. pp60, 62, 65.

⁴³⁴ Capra, F. (2007). *The science of Leonardo*. p57. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p13. Benesch, O. (1943). *Leonardo da Vinci and the beginning of scientific drawing*. p320. Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p298.

⁴³⁵ Bronzino, J. D. (1995). *The biomedical engineering handbook*. pp17-24. Ozkaya, N. Nordin, M and Leger, D. (1999) *Fundamentals of biomechanics: equilibrium, motion, and deformation*. p5. Hoffman, S. J. (2009) Introduction to kinesiology: studying physical activity. p273. Clark, K. (1971). *Civilisation*. p135. Capra, F. (2007). *The science of Leonardo*. p57.

⁴³⁶ Riskin, J. (2010). *Machines in the garden*. p24. Kemp, M. (2006). *Leonardo da Vinci – the marvellous works of nature and man*. p344. Templer, J. A. (1992). *The staircase: history and theories*. p76.

⁴³⁷ Rosheim, M.E. (2006). *Leonardo's lost robots*. p22.

⁴³⁸ Capra, F. (2007). *The science of Leonardo*. p125. Sawday, J. (2007). *Engines of the imagination: Renaissance culture and the rise of the machine*. pp1, 90. Da Vinci, L. and Richter, J. P. (1970). *The notebooks of Leonardo da Vinci (volume 1)*. pxxii. Rosheim, M.E. (2006). *Leonardo's lost robots*. p22. Riskin, J. (2003). *The defecating duck or the ambiguous origins of artificial life*. p601.

Automated lions and uncertain authorship aside, the experimentation of the stair for King Francis I at Blois that revealed the potential of the outward view, also became applied inward as emboldened by the success of such experiments that had dissolved the walls, more daring designers experimented with removing the newel also, prompting the development of the light shaft⁴³⁹. This was of great benefit for internal stairs, which were typically otherwise very poorly lit (by insufficient, narrow wall slots), if at all. It was also quite startling, because as with the dissolution of the exterior walls, (leading to the exposure of the stair and an external focus) this strategy applied to the interior enabled the connection of horizontal floors in a completely new way. With expanded slight lines, an increased sense of vertically was created, creating a sensation of spiralling journey. The potential for new manipulations and perceptions of space to occur became apparent. As with the stair at Blois, such stairs were not only intended to enable vertical transit, but to enable vertical *travel*, to become an event, an experience of journey that elevated the intention from built construction to the architecting and awareness of space⁴⁴⁰.

In this manner, the presence of such stairs became quite fashionable as a demonstration of social status in the great castles, churches, monasteries and places of Europe, while its compact size and reduced space requirements increased the ease with which it could be incorporated into the plan (as a feature)⁴⁴¹. This new-found interest gave rise to some adventurous experiments and variations in the form of part revolutions and the double helix, such as that of the Chateau de Chambord (also constructed by King Francis I from 1519-1547) that were quite extraordinary in appearance and execution.⁴⁴² Unfortunately, despite the increase in such experiments suggesting that the stair was becoming more visible and even popular and whether of great designers' devising or not, such erratic spatial explorations still remained the exception rather than norm. For those who could afford them, the nobility and the church, privileged foibles and experiments in the form of stairs such as Blois and the double helix at the Chateau de Chambord remained just that, experiments⁴⁴³.

⁴³⁹ Templer, J. A. (1992). *The staircase: history and theories*. p66.

⁴⁴⁰ Templer, J. A. (1992). *The staircase: history and theories*. pp60, 66-68.

⁴⁴¹ LePage, J-G. G.G. (2002). *Castles and fortified cities of medieval Europe: an illustrated history*. pp74, 81. Templer, J. A. (1992). *The staircase: history and theories*. p54.

⁴⁴² Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp18-19, 23. LePage, J-G. G.G. (2002). *Castles and fortified cities of medieval Europe: an illustrated history*. pp74, 81.

⁴⁴³ Templer, J. A. (1992). *The staircase: history and theories*. p195.

1.2.6 Mannerist Mischief: Michelangelo and the Laurentian Stair

One other rather extraordinary diversion from the stair as impositional awkwardness of the time however was that of the stair of the Laurentian Library in Florence by the sculptor and artist Buonarroti Michelangelo (1475-1564)⁴⁴⁴. The Laurentian Library was commissioned of Michelangelo in 1523 by Pope Clement VII of the Medici family and was intended to demonstrate that the family had risen above their mercantile beginnings to become part of the European intellectual and ecclesiastic elite by housing their collection of manuscripts and printed books⁴⁴⁵. Design began in 1524, construction began in 1525⁴⁴⁶. As Michelangelo left Florence in 1534 however, by which time only the walls of the reading room had been completed, the project was continued (variously) by the sculptor Niccolò Tribolo (1500-1550) and Florentine sculptor-turned-architect Bartolomeo Ammannati (1511-1592) based on a combination of plans, verbal instructions from Michelangelo and a small clay model⁴⁴⁷. Both because the site was relatively restricted and because of the need to protect its contents from damp, the library itself is on the first floor, elevated about the surrounding structures⁴⁴⁸. On entering the building at ground floor level, the visitor steps into the vestibule, known as the Ricetto, a double height box of a space, the site for which was roughly square⁴⁴⁹. Access to the library is obtained by the staircase but whereas a considerable amount of floor space would usually be allocated around the stair, almost half of the limited floor space is taken up by it and there is very little room around the sides⁴⁵⁰. The stair is so vastly grandiose compared to the simplicity of its function and the lack of space available to fulfil it that it appears both wildly overscaled for the space and oddly detached from it, an effect exacerbated by the Ricetto's apparently excessive height⁴⁵¹. The stair pushes itself out to the perimeter of the room and its corners, even as it seems to shrink from them.

⁴⁴⁴ Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p104. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp6, 9.

⁴⁴⁵ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp38-39. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p308.

Clark, K. (1971). *Civilisation*. p93.

⁴⁴⁶ Wittowka, R. (1934). *Michelangelo's biblioteca Laurenziana*. pp139, 142, 146, 150, 154-156, 166.

⁴⁴⁷ The last is not quite as odd as it sounds, perspective drawing was only in its infancy, and models were a valued method of testing designs, communicating ideas and quantifying mass. Million A. H. (1994). *Models in Renaissance Architecture*. In Million, A. H. [Ed.] *Italian Renaissance architecture from Brunelleschi to Michelangelo*. pp. Harbison, R. (2009). *Travels in the history of architecture*. pp161-162. Kostof, S. (1977). *The architect: chapters in the history of the profession*. pp108-109, 142.

⁴⁴⁸ Salmon, F. (1990). *The site of Michelangelo's Laurentian library*. p418. Harbison, R. (2009). *Travels in the history of architecture*. pp161-162. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p184.

⁴⁴⁹ Wittowka, R. (1934). *Michelangelo's biblioteca Laurenziana*. p128.

⁴⁵⁰ Gormley, D. M. (1974). *A bibliographic essay of western library architecture*. p11. Wittowka, R. (1934). *Michelangelo's biblioteca Laurenziana*. p128. Salmon, F. (1990). *The site of Michelangelo's Laurentian library*. p418. Harbison, R. (2009). *Travels in the history of architecture*. pp161-162.

⁴⁵¹ Quantrill, M. (1994). *The library and the Laurentian enigma*. pp159-161. Templer, J.A. (1992). *The staircase: histories and theories*. p32. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p308.

It was a grand entrance, without actually any room *for* and in which to effect a grand entrance⁴⁵².

The stair itself comprises a central flight from the library to the ground floor (a height of three meters) and two flights either side, at least until as far as the intermediate landing, where all three merge⁴⁵³. The treads of the two outer flights are straight, consistent in dimensions and flanked on the outsides by stairs that are twice the size of the others⁴⁵⁴. The treads of the centre flight however are convex and vary in width, the last three to the ground floor being especially wide and high compared to the rest, providing a particularly treacherous inconsistency⁴⁵⁵. Their curving forms are rigidly constrained by the classical rectangular balusters, although confusingly, these are too low to use (and which haven't even been continued to the last two sets of steps)⁴⁵⁶. The whole effect is such that the centre stair, constrained between the rigidity of the straight flights, appears almost to ooze with implacably volcanic force from the reading room above, to puddle thickly onto the ground floor; an unstoppable force meeting an immovable object, further compressing the space that surrounds it⁴⁵⁷. The entirety of this odd combination is such that the stair appears to suggest more of an aggressive advance than an inviting ascent and embodies an alarming and unsettling mix of staticism and movement⁴⁵⁸.

The bizarre nature of the stair is further highlighted by the host of other peculiarities the space exhibits, in which not only have the walls have been treated like *exterior* facades, but ones upon which traditionally classical elements have been apparently haphazardly used⁴⁵⁹. Double height pilaster columns appear to emerge from the walls even while they remain trapped within them and rest on corbels that appear weak; it is hard to read the structural logic to tell if the columns or walls support the roof⁴⁶⁰. The material is not marble as one

might expect for such a prestigious project intended to convey status and the ambiguously maybe-tabernacles hold no sculpture⁴⁶¹. The columns are pietra serena (dark stone) while between them are no windows, but moulded framings in panelled blind white walls stretch that stretch taut between the pilasters⁴⁶². Instead of appearing demurely and *horizontally* in their usual situations, volutes have been positioned sideways to hang off the stairs while other elements appear to be upside down⁴⁶³. Thus while all the classical elements that might have been expected to be present in an early Renaissance building of the time *were* present, the expected, collective classical *story* cannot be read here; the entirety of the Ricetto, including the stair, has been manipulated and distorted into a personal expression of Michelangelo's sculptural preoccupations for drama, uncertainty and an architecture of organic anatomy rather than the Renaissance preoccupation with the classical ideals of number, proportion and geometry that were then considered the foundations of architectural harmony⁴⁶⁴.

Figure 55: The plan of the Ricetto for the Laurentian library

Figure 56: The Ricetto - an entrance with no room for an entrance, creating an uncomfortable tension

⁴⁵² Harbison, R. (2009). *Travels in the history of architecture*. pp161-162.
⁴⁵³ Wittowka, R. (1934). *Michelangelo's biblioteca Laurenziana*. p128. Quantrill, M. (1994). *The library and the Laurentian enigma*. pp159-161. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p184.
⁴⁵⁴ Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p32. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p308. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p184. Wittowka, (1934). *Michelangelo's biblioteca Laurenziana*. p158.
⁴⁵⁵ Wittowka, (1934). *Michelangelo's biblioteca Laurenziana*. p166. Harbison, R. (2009). *Travels in the history of architecture*. pp161-162.
⁴⁵⁶ Harbison, R. (2009). *Travels in the history of architecture*. pp161-162.
⁴⁵⁷ Wittowka, (1934). *Michelangelo's biblioteca Laurenziana*. p206. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p308. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p184.
⁴⁵⁸ Wittowka, (1934). *Michelangelo's biblioteca Laurenziana*. pp207-208, 214-216. Harbison, R. (1998). *Thirteen ways: theoretical investigations in architecture*. p12-13.
⁴⁵⁹ Wittowka, R. (1934). *Michelangelo's biblioteca Laurenziana*. p206.
⁴⁶⁰ Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p106. Harbison, R. (2009). *Travels in the history of architecture*. pp161-162. Templer, J. A. (1992). *The staircase: history and theories*. p72. Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p310. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p184.

⁴⁶¹ Harbison, R. (2009). *Travels in the history of architecture*. pp161-162.
⁴⁶² Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p38. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p183-184. Harbison, R. (2009). *Travels in the history of architecture*. pp161-162. Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p310.
⁴⁶³ Harbison, R. (2009). *Travels in the history of architecture*. pp161-162.
⁴⁶⁴ Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p106. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p184. Wittowka, (1934). *Michelangelo's biblioteca Laurenziana*. pp208, 213. Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p309. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. pp101-102.

Figure 57: Classical conformity gives way to chaos as a conventional architectural language that would normally convey structure and meaning is displaced and reversed

Figure 58: Chaos from on high; the bizarre overscaling of the stair appears exaggerated when viewed from above, and the excessive height of the Ricetto creates further ambiguity and confusion

Figure 59: Varying vagaries; the chaos extends to the varying dimensions of the treads and risers. We expect consistency of our stairs. Difference is unnerving.

The entire Ricetto, this combination of space and stair, structure and decoration, classicism and capricious personal ideals, function and purposelessness, that combines to create this *sculpture as architecture*, is such an extraordinary collision of contradictions, so ambiguous, so uncertain, so *unusual*, that it is difficult to take in⁴⁶⁵. It comprises an unnerving demonstration of illusion versus reality, expectations versus actuality, that is so bizarre, violent and intense that the space appears to be perpetually on the brink of self-destruction⁴⁶⁶. It vacillates between a conflict of outwards explosion on the one hand, unable to constrain the expansion of the infighting of the elements within as they compete for attention, and on the other, implosive, compressive collapse as it struggles under the weight of trying to reconcile multiple, apparently conflicting structural demands and an inherent inability to do so⁴⁶⁷. The whole effect is so unnerving and uncomfortable, it is not too surprising that the Ricetto was greeted with a stunned mixture of praise, shock and awe, and a great deal of confusion⁴⁶⁸. As a demonstration of power however, it certainly did what the Medici's had intended, which was to gain attention through the creation of a dramatic statement⁴⁶⁹. The chaos of the Ricetto is further emphasised by the design of the library itself (supposedly the actual point of the exercise) and the reading room for Greek and Latin texts, which is the epitome of serenity (and relief)⁴⁷⁰. Of long proportions, consistent with the monastic libraries of the times it comprises a calm, composed, modular whole, quiet and restful, accommodating the gentle tranquillity of natural lighting though what was a more typically Renaissance (and therefore familiar) arrangement of large, uniformly sized and harmoniously spaced windows⁴⁷¹.

The Ricetto was so unexpected, so unusual, so at odds with the prevailing ethos of the time that for the most part Michelangelo's contemporaries did not know what to make of it⁴⁷². The first major architectural historian of the Renaissance, Jacob Burckhardt (1818-1897), writing on the stair many years later in *Cultur der Renaissance in Italien* (published 1860), would

⁴⁶⁵ Sorensen, Lee. (2011). 'Burckhardt, Jakob.' *Dictionary of Art Historians*. (available online). Padovan, R. (1999). *Proportion science philosophy architecture*. p265. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. pp106-107. Wittowka, R. (1934). *Michelangelo's biblioteca Laurenziana*. pp206, 208, 213, 216.

⁴⁶⁶ Harbison, R. (1998). *Thirteen ways: theoretical investigations in architecture*. pp12-13.

⁴⁶⁷ Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p310. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p39. Harbison, R. (1998). *Thirteen ways: theoretical investigations in architecture*. pp12-13. Wittowka, R. (1934). *Michelangelo's biblioteca Laurenziana*. pp206-208, 213, 216.

⁴⁶⁸ Harbison, R. (1998). *Thirteen ways: theoretical investigations in architecture*. pp12-13. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. pp106-108.

⁴⁶⁹ Clark, K. (1971). *Civilisation*. p93. Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. pp309-310. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p183.

⁴⁷⁰ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p38. Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p310.

⁴⁷¹ Smith, T. (1884). *Architecture: gothic and Renaissance*. p163. Fazio, M., Moffett, M. and Wodehouse, L. (2008) *A world history of architecture*. p310. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p39.

⁴⁷² Hemsoll, D. (2003). *The Laurentian library and Michelangelo's architectural method*. pp30, 32, 62.

still confess himself to be completely baffled by the stair and Ricetto, declaring it to be ‘an incomprehensible joke of the great master’⁴⁷³. And again, as with Leonardo’s stair at Blois, Michelangelo’s stair at the Laurentian Library, this spatial subversion, was destined to remain something of an aberrant deviation, a peculiar hybrid, a curious mixture of old and new. The mannerist style as it came to be known, was short lived, (Burkhardt, amongst many others considered it ‘raw’ and ‘deviant’⁴⁷⁴). However, even if largely incomprehensible at the time and for many years afterwards, as a mannerist oddity, the Laurentian stair, joke or not, was important for another reason, this being that from Michelangelo’s plastic manipulation of space and forceful, sculptural, sensual manipulation of classical forms, came the grand interior stairs of the seventeenth century⁴⁷⁵. Here, in the ‘shift in focus from Vitruvian classicism and in the increasing Renaissance interest in and fashion for the garden, the beginnings of the Baroque stair were formed’⁴⁷⁶.

Figure 60: The Laurentian library itself; classically ordered and harmonious - a serene relief after the startling assault of the Ricetto

1.2.7 Alberti’s Stair: A Disturbing Affair

For the most part though, brief mannerist diversions aside, the stair remained very much an ‘awkward accessory’⁴⁷⁷. But if Vitruvius had had relatively little to say on stairs, and the medieval masters scarcely more (whether through lack of interest or the zealous guarding of trade secrets, or loss of records), Leon Battista Alberti (1404-1472), author of what is largely regarded as the second treatise on architecture, *De re aedificatoria* (*Ten Books on Architecture*) (1452) and Renaissance scholar extraordinaire, had somewhat more⁴⁷⁸. Unfortunately for the stair, given the immense influence Alberti was to wield as one of Western Europe’s most eminent and influential humanists and scholars (of architecture, engineering, art, sculpture, philosophy, mathematics, drawing, painting, finance, economics and in fact just about anything of intellectual and cultural importance at the time), most of it was not overly enthusiastic. Although not entirely negative towards the stair (Alberti recommended that ‘they should be ample and spacious according to the dignity of the place’), his overriding opinion was that ‘scalae esse architecturae perturbatrice,’ or ‘stairs disturb the floor plan’⁴⁷⁹. Alberti regarded the distribution of stairs as ‘difficult’, requiring ‘careful and mature study’ and ‘unique’, in having three openings; the door that led to the enclosed staircase, the window that illuminated it, and the opening in the floor that it connected⁴⁸⁰. ‘For this reason’ he wrote, ‘it is said that the stairs hinder all good house designs’⁴⁸¹. He went on to say ‘the fewer staircases that are in a house, and the less room they take up, the more convenient they are esteem’d’⁴⁸².

This rather disparaging commentary is more readily understood when it is noted that, for Alberti, Vitruvius was the essential arbitrator of theoretical study upon which design for the new era (and rescue from the barbarism of the gothic) should be based, and as in classical Greek and Roman times, the principle rooms were typically situated upon the ground floor of the house. Anything allocated to the upper floors was either of less importance (servants

⁴⁷³ Mallgrave, H. F. (2010). *The architect’s brain*. p155. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. pp106-107.

⁴⁷⁴ Sorensen, Lee. (2011). ‘Burckhardt, Jakob.’ *Dictionary of Art Historians*. (available online). Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p172.

⁴⁷⁵ Wittowka, R. (1934). *Michelangelo’s biblioteca Laurenziana*. p215. Templer, J. A. (1992). *The staircase: history and theories*. p32.

⁴⁷⁶ Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p49. Templer, J. A. (1992). *The staircase: history and theories*. pp18-19. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p184.

⁴⁷⁷ Spens, M. (1995). *Staircases: Detail in Building*. p7.

⁴⁷⁸ Quantrill, M. (1974). *Ritual and response in architecture*. pp12, 43, 95-100, 112-113. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p112. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p112. Kostof, S. (1977). *The architect: chapters in the history of the profession*. pp97, 106, 111-113, 124. Alberti, L. B. and Rykwert, J. [trans.] (1991). *De re aedificatoria*. p30.

⁴⁷⁹ Kostof, S. (1995). *A history of architecture: settings and rituals*. p379. Habermann, K. J. (2003). *Staircases: design and construction*. p12. Alberti, L. B. and Rykwert, J. [trans.] (1991). *De re aedificatoria*. p31.

⁴⁸⁰ Alberti, L. B. and Rykwert, J. [trans.] (1991). *De re aedificatoria*. p31. Templer, J. A. (1992). *The staircase: history and theories*. p72. Habermann, K. J. (2003). *Staircases: design and construction*. pp14, 72.

⁴⁸¹ Habermann, K. J. (2003). *Staircases: design and construction*. p14. Alberti, L. B. and Rykwert, J. [trans.] (1991). *De re aedificatoria*. p31.

⁴⁸² Templer, J. A. (1992). *The staircase: history and theories*. p72. Alberti, L. B. and Rykwert, J. [trans.] (1991). *De re aedificatoria*. p31.

quarters) or private, and therefore was not required to demonstrate the same level of status and elegance as public areas⁴⁸³. This reduction in the purpose of the stair to its primary aim, enabling vertical access, meant that once its constructional functionality had been ensured little else appeared to be expected or required of it in either experiential or aesthetic terms. This situation was further exacerbated by the increasing tendency of the era to require external as well as interior stairs, a particularly common situation in cities such as Venice that arose due to the division of existing buildings into apartments⁴⁸⁴. This less than enthusiastic regard did not prevent Alberti from carefully analysing the stair and its planning and management in terms of spatial and circulatory impact however⁴⁸⁵. Even if the stair itself was not of experiential or aesthetic significance, and its presence and functional ensurance might be highly inconvenient, its thoughtful implementation was necessary if the house as ordered architectural whole was not to be spoiled by careless handling, and its occupant's requirements for circulatory privacy were to be appropriately met⁴⁸⁶.

1.3 Renaissance Revelations: In, Out and Baroque it all About

1.3.1 A Walk in the Park: The Garden Stair

If Alberti was not so interested in the interior stair, except in terms of minimising the potential havoc it could wreak upon the harmony of the architectural plan, he was however considerably more interested in the garden⁴⁸⁷. This apparent tangent is more easily understood when the fashions of the time are considered. In the early fifteenth century, nature, as an expression of the divine order (harmony) of God, had become a source of fascination and flora, the ordered garden and knowledge of it was thus regarded by Alberti and the cultured (or those who wished to be seen as such) as much an evidence of its owner's intellectual reflection and scholarship, prowess, taste, culture, wealth and associated status as their house⁴⁸⁸. In fact, by the end of the sixteenth century, for the nobility the garden became an even more fashionable preoccupation than the house, for the larger scale at which its owner's refinement was able to be executed and demonstrated⁴⁸⁹. Evidence of this increasing fascination for nature is demonstrated by the founding of the first botanical garden established in Europe, in Padua, in 1545⁴⁹⁰. A contemporary text described the garden as 'a collection of the whole world in a chamber', which perfectly embodied the Renaissance reverence for and belief in cosmological order and consequent preference for the tidy compartmentalisation of space (into geometric figures) according to function⁴⁹¹.

⁴⁸³ Good, R. (2009). *Double staircases and the vertical distribution of housing in Venice 1450–1600*. p75.
⁴⁸⁴ Good, R. (2009). *Double staircases and the vertical distribution of housing in Venice 1450–1600*. pp73–74.
⁴⁸⁵ Habermann, K. J. (2003). *Staircases: design and construction*. p14. Templer, J. A. (1992). *The staircase history and theories*. p72.
⁴⁸⁶ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp113–114. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p157.

⁴⁸⁷ Neville, J. (1999). *Dance and the garden: moving and static choreography in Renaissance Europe*. p811. Lazzaro, C. (1990). *The Italian Renaissance garden*. p71.
⁴⁸⁸ Tongiorgi Tomasi, L. (2005). Gardens of Knowledge and the Republique des Gens de Sciences. In Conan, M. (Ed.), *Baroque garden cultures: emulation, sublimation, subversion*. (p91.) Shepherd, J. and Jellicoe, G. A. (1996). *Italian gardens of the Renaissance*, 5th ed. p11. Neville, J. (1999) *Dance and the Garden: Moving and Static Choreography in Renaissance Europe*. pp809, 811. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp532
⁴⁸⁹ Attlee, H. and Ramsay, A. (2006). *Italian gardens: a cultural history*. p117. Templer, J. A. (1992). *The staircase: history and theories*. p90. Neville, J. (1999). *Dance and the garden: moving and static choreography in Renaissance Europe*. p809.
⁴⁹⁰ Lazzaro, C. (1990). *The Italian Renaissance garden*. p76. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p182. Tongiorgi Tomasi, L. (2005). Gardens of Knowledge and the Republique des Gens de Sciences. In Conan, M. (Ed.), *Baroque garden cultures: emulation, sublimation, subversion*. (pp85–86, 91.) Laras, A. (2005). Gardens of Italy. p146.
⁴⁹¹ Laras, A. (2005). Gardens of Italy. p147. Attlee, H. and Ramsay, A. (2006). *Italian gardens: a cultural history*. p119. Lazzaro, C. (1990). *The Italian Renaissance garden*. p69. Tongiorgi Tomasi, L. (2005). Gardens of Knowledge and the Republique des Gens de Sciences. In Conan, M. (Ed.), *Baroque garden cultures: emulation, sublimation, subversion*. (pp93–94.) Pelletier, L. (2006). *Architecture in words: theatre, language and the sensuous space of architecture*. p4. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p157.

During the seventeenth century the garden expanded from the smaller scale and typically enclosed nature of Alberti's understanding however, to become the Great Garden⁴⁹². These enormous living canvases were the result of intense and meticulous planning in which the control and ordering of space – its dimensions, proportions, symmetry, geometry, sight lines and crucially, its compartmentalisation within the harmonious construction of the whole into the outdoor equivalent of 'room and passage' - were very similar to those applied within the house⁴⁹³.

Figure 61: Europe's first botanic garden, Padua, Italy, 1545. Francis Bacon described the nature of the garden as to 'have in a small compass a model of universal nature made private'

Figure x: The garden of the Chateaux Vaux-le-Vicomte, 1657-1661, by Andre le Notre

In a mere 110 years, the garden had expanded from the small enclosure of Alberti's time, to the Great Landscape. The use of the garden to convey status became very popular

The great difference between the formal garden and the house however, aside from the scale, was that the former were designed to be viewed from above, in order that the extent and elaborateness of their nature could be fully appreciated⁴⁹⁴. As a result, the land on which they were laid out was generally inclined, with stairs used to create levels and facilitate movement between them⁴⁹⁵. Whilst the view from above was imperative to appreciate the garden in its entirety, when within the garden, the emphasis was upon journey, and the stair became a key component of effecting this, eventually becoming so important that the architecture of the stairs frequently became the event around which the garden and all associated experiences revolved⁴⁹⁶. The use of stairs to enable changes in level could frame views, hide or reveal them, direct movement and generate patterns⁴⁹⁷. Freed also from the spatial constraints of their interior cousins exterior stairs could be treated differently. With new opportunities for design and experimentation, a far wider variation in form, scale and proportion could be achieved, in turn affecting movement and pace. Lower, broader and / or curved flights encouraged a gentle pace for prospective wandering and comfortable strolling while straight, narrower, enclosed and / or tapering flights increased pace and drama⁴⁹⁸. By such contrivances architects turned garden designers such as Francesco di Giorgio Martini (1439-1502), Giuliano da Sangallo (1443-1516) and Donato Bramante (1444-1514) effected compartmentalised garden 'rooms' that although implemented at a grand scale, resembled those of the interior of a house⁴⁹⁹. The patterns of these houses-as-garden might be static, but their experience was not, visitors were guided at every turn through an elaborate journey which, aided by dramatic articulation of the stair, was designed to unfold as a series of rich and varied experience spatial experiences⁵⁰⁰.

⁴⁹² Plumptre, G. (1993). *The water garden: styles, designs and visions*. p43. Nevile, J. (1999). *Dance and the garden: moving and static choreography in Renaissance Europe*. pp811- 819. Blanc. A. and Blanc, S. (2001). *Stairs, second edition*. p80.

⁴⁹³ Weiss, A. S. (1995). *Mirror of infinity: the French formal garden and 17th-century metaphysics*. p13. Nevile, J. (1999). *Dance and the Garden: Moving and Static Choreography in Renaissance Europe*. p811. Lazzaro, C. (1990). *The Italian Renaissance garden*. p69-70, 72.

⁴⁹⁴ Weiss, A. S. (1995). *Mirror of infinity: the French formal garden and 17th-century metaphysics*. p15. Nevile, J. (1999). *Dance and the garden: moving and static choreography in Renaissance Europe*. pp806, 809, 818. Templer, J. A. (1992). *The staircase: history and theories*. p103. Padovan, R. (1999). *Proportion science philosophy architecture*. p264. Lazzaro, C. (1990). *The Italian Renaissance garden*. p71.

⁴⁹⁵ Blanc. A. and Blanc, S. (2001). *Stairs, second edition*. p72. Plumptre, G. (1993). *The water garden: styles, designs and visions*. p57. Lazzaro, C. (1990). *The Italian Renaissance garden*. pp92, 98.

⁴⁹⁶ Nevile, J. (1999). *Dance and the garden: moving and static choreography in Renaissance Europe*. p823. Templer, J. A. (1992). *The staircase: history and theories*. p111, 113. Lazzaro, C. (1990). *The Italian Renaissance garden*. p99. Blanc. A. and Blanc, S. (2001). *Stairs, second edition*. p73.

⁴⁹⁷ Lazzaro, C. (1990). *The Italian Renaissance garden*. pp99-100. Nevile, J. (1999). *Dance and the garden: moving and static choreography in Renaissance Europe*. p811.

⁴⁹⁸ Blanc. A. and Blanc, S. (2001). *Stairs, second edition*. p74.

⁴⁹⁹ Lazzaro, C. (1990). *The Italian Renaissance garden*. p71. Blanc. A. and Blanc, S. (2001). *Stairs, second edition*. pp72, 76.

⁵⁰⁰ Tongiorgi Tomasi, L. (2005). *Gardens of Knowledge and the Republique des Gens de Sciences*. In Conan, M. (Ed.), *Baroque garden cultures: emulation, sublimation, subversion*. (p91.) Weiss, A. S. (1995). *Mirror of infinity: the French formal garden and 17th-century metaphysics*. pp21, 23. Templer, J. A. (1992). *The staircase: history and theories*. p111. Lazzaro, C. (1990). *The Italian Renaissance garden*. p99.

Movement and views were carefully composed so as to create the requisite combination of momentum and rest, progression and pause, openness and enclosure and guidance and freedom. These and the careful planning of colour, sound, scent, texture, water, light, shade, warmth, cool, visibility, level, height and depth offered a sensory exploration of great surprise, drama and delight⁵⁰¹.

Figure 63: Dragon fountain and stair, Villa d'Este, Italy

Figure 65: View from the head of the stairs at the organ terrace, Villa d'Este, Italy

Figure 67: The grand stair, Villa d'Este, Italy

Figure 64: Grand Stair, Villa Garzoni, Italy

Figure 66: Grand Stair, Villa Farnese, Caprarola

Water became an especially popular feature of the gardens, used to both express the Baroque delight with dynamic motion and vigour and to impress visitors with decorative inventiveness⁵⁰². Fountains, pools, cascades, water chains, chutes, grottoes, mascarons and theatres were to be found in abundance, and also, increasingly, elaborate automata, as in the gardens in the Pratalino Palazzi near Florence, created by the architect-engineer-artist Bernardo Buontalenti (1531-1608) for Francesco 1 de' Medici, Grand duke of Tuscany⁵⁰³. Begun in 1569 the gardens incorporated many mechanical water features to delighted acclaim and were hugely popular for their marvellous aesthetic, ingenious natures and increasingly their theatrical trickery – by which spectators were lured into receiving an unexpected dowsing and thus into becoming participants⁵⁰⁴. Some of these giochi d'acqua (water games) were even incorporated into the stairs such that the writer Michel de Montaigne (1533-1592) noted in his journal that guests fleeing a tricksterish surprise soaking in one grotto by trying to rush up the castle stairs would be further surprised by jets of water that spurted from the steps up which they were trying to flee⁵⁰⁵. (One can also imagine that of the dinner guests of Duke Alfonso II who, while dining at his villa in Poggioreale near Naples, were suddenly drenched mid-meal by the several feet of water that he had arranged to pour torrentially into his courtyard at that precise moment, might have considered that he had taken things just a little *too far*, both at the time as they were staggering to their feet and wringing out their clothes and later while relaying the event in letters to friends afterwards⁵⁰⁶.)

Drenchings aside, this playful desire to incorporate movement and water was hugely popular, and manifested many charming (and less violently saturating) designs, including those of the stairs leading to the casino (summerhouse) at the Villa Farnese (1584-56), at Caprarola, designed by the architect Giacomo Barozzi da Vignola (1507-1573) for the Cardinal Farnese⁵⁰⁷. The stairs, unique for that time, appear almost like a grand boulevard, confined between

⁵⁰² Sawday, J. (2007). *Engines of the imagination: Renaissance culture and the rise of the machine*. pp32, 44. Templer, J. A. (1992). *The staircase: history and theories*. p13-105. Plumtre, G. (1993). *The water garden: styles, designs and visions*. p43. Tongiorgi Tomasi, L. (2005). Gardens of Knowledge and the Republic of the Gens de Sciences. In Conan, M. (Ed.), *Baroque garden cultures: emulation, sublimation, subversion*. (p86.) Ehrlich, T. L. (2005). Pastoral Landscape and Social Politics in Baroque Rome. In Conan, M. (Ed.), *Baroque garden cultures: emulation, sublimation, subversion*. (pp143-145.) Lazzaro, C. (1990). *The Italian Renaissance garden*. pp62-68.

⁵⁰³ Lazzaro, C. (1990). *The Italian Renaissance garden*. pp137, 142, 162, 165. Plumtre, G. (1993). *The water garden: styles, designs and visions*. pp43-55, 57.

⁵⁰⁴ Eco, U. (2004). *On beauty*. pp388, 390. Sawday, J. (2007). *Engines of the imagination: Renaissance culture and the rise of the machine*. pp44-45. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp72-73. Riskin, J. (2010). *Machines in the garden*. p33. Ehrlich, T. L. (2005). Pastoral Landscape and Social Politics in Baroque Rome. In Conan, M. (Ed.), *Baroque garden cultures: emulation, sublimation, subversion*. (p148.) Lazzaro, C. (1990). *The Italian Renaissance garden*. pp65-68. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp80-81.

⁵⁰⁵ Riskin, J. (2010). *Machines in the garden*. p33. Lazzaro, C. (1990). *The Italian Renaissance garden*. p65. Plumtre, G. (1993). *The water garden: styles, designs and visions*. p48.

⁵⁰⁶ Lazzaro, C. (1990). *The Italian Renaissance garden*. p65.

⁵⁰⁷ Gabriel, J. F. (2005). 1584-86 *Classical architecture for the twenty-first century*. p183.

⁵⁰¹ Rosheim, M.E. (2006). *Leonardo's lost robots*. p120. Templer, J. A. (1992). *The staircase: history and theories*. pp38, 113. Lazzaro, C. (1990). *The Italian Renaissance garden*. pp47-48, 171.

two walls and divided by an ornate water chain, providing a delightful sight and sound, and a sensation of mobility that both contrasts with and complements the stairs⁵⁰⁸. The escalier d'eau in the gardens of the Palce of Versailles (1675), by Andre Le Notre (1617-1700), does likewise, although rather more sedately, and the stair is flanked by trees instead of walls to provide coolness and shade. These also have breaks at intervals to allow walkers to wander freely to and from the steps, creating the more relaxed appearance and sensation of a 'room', encouraging walkers to pause, rather than a processional boulevard through which a party is directed to progress⁵⁰⁹. Other gardens that integrate water and stairs include the terraced and stepped landscape at the rear of the Villa d'Este at Tivoli, designed by the humanist Pirro Ligorio (1510-1583) for the Cardinal Ippolito II d'Este⁵¹⁰ during the 1550s and 1560s. The Cardinal, inspired by the success of his rival Farnese's gardens, felt compelled to exceed it by the creation of his own, which thanks to Ligorio's brilliance, he did⁵¹¹. The garden was famed and feted for its unusual principle, the scale at which it was effected and the brilliance of its ingenuity, novelty and execution⁵¹². Deliberately situated upon an incline and with a vista that overlooks the village of Tivoli, it was conceived around the passage of water from the top to the bottom of the garden⁵¹³. Consequently, a multitude of levels, ramps, diagonal paths and a succession of staircases link and meander from the palace to the furthest terrace twenty meters away, and throughout the multiple pathways, pools, fountains, giochi d'acqua – water jets, including on the stairs - a veritable zoo of hybridic statuary, fauna and mascarons (all exceptionally popular adornments of the time) and even a water organ, are used as emphasis and embellishment⁵¹⁴.

⁵⁰⁸ Plumptre, G. (1993). *The water garden: styles, designs and visions*. p59. Laras, A. (2005). *Gardens of Italy*. pp55-56. Lazzaro, C. (1990). *The Italian Renaissance garden*. pp90, 108.

⁵⁰⁹ Exner, U. and Pressel, D. (2009). *Spatial Design*. p39. The experience of water was somewhat fragmented at Versailles however as the water pressure was insufficient to enable all the fountains to 'fount' simultaneously. Whenever the king (Luis XIV) went about, relays of courtiers would precede him in advance so as to be able to turn on whichever fountains would be in his view. Weiss, A. S. (1995). *Mirror of infinity: the French formal garden and 17th-century metaphysics*. p48.

⁵¹⁰ Sawday, J. (2007). *Engines of the imagination: Renaissance culture and the rise of the machine*. p44. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p76. Benes, M. (1999). Recent Developments and Perspectives in the Historiography of Italian Gardens. p44. In: Michel, C. [Ed.] *Perspectives on garden Histories*. (pp36-76).

⁵¹¹ Riskin, J. (2010). *Machines in the garden*. p33. Benes, M. (1999). Recent Developments and Perspectives in the Historiography of Italian Gardens. p44. In: Michel, C. [Ed.] *Perspectives on garden Histories*. (pp36-76). Templer, J. A. (1992). *The staircase: history and theories*. p104-105. Plumptre, G. (1993). *The water garden: styles, designs and visions*. p59. Lazzaro, C. (1990). *The Italian Renaissance garden*. p95.

⁵¹² Plumptre, G. (1993). *The water garden: styles, designs and visions*. pp59-63. Lazzaro, C. (1990). *The Italian Renaissance garden*. pp217, 240.

⁵¹³ Laras, A. (2005). *Gardens of Italy*. p35, 38. Lazzaro, C. (1990). *The Italian Renaissance garden*. p216. Plumptre, G. (1993). *The water garden: styles, designs and visions*. p61.

⁵¹⁴ Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp72-73. Thacker, C. (1985). *The history of gardens*. pp100, 104. Lazzaro, C. (1990). *The Italian Renaissance garden*. p140, 223, 229. Plumptre, G. (1993). *The water garden: styles, designs and visions*. pp62-63. Laras, A. (2005). *Gardens of Italy*. pp37-38. Lazzaro, C. (1990). *The Italian Renaissance garden*. pp98-99, 228-229.

Guests would arrive at the lowest level and make their way through the gardens to the Palace above, at which point they would be rewarded by the wonderful vista of the journey they had just undertaken and Tivoli beyond, enabling appreciation of the garden's planning in another manner again⁵¹⁵.

These extensive and exquisitely staged gardens in which the stair's presence played such a central role may have been designed to give the appearance of a vista suited to casual but elegant strolling, but they were anything but casual in the planning⁵¹⁶. Their entirety was devised to create a carefully orchestrated, meticulously detailed experience in keeping with the Baroque love of the decorative, the marvellous, the exuberant and the dramatic of which the stair was a key enabler; intended to be a focus of and theatre for sensory experience⁵¹⁷. Through the gardens of such architect-designer-engineers as Bramante, Le Notre, Ligorio and Buontalenti an entirely new sense of the stair's potential to express, control and experience space in an extraordinarily sophisticated manner, became apparent⁵¹⁸.

1.3.2 Palladio's Approach: An Exterior Entrance

As awareness of this use of the external stair to create emphasis and grandeur, and therefore a sense of journey or approach increased, there was new appreciation of the stair's capacity to go beyond being merely useful to creating drama and spectacle. By the time, the architect Andrea Palladio (1508-1580) published his own treatise *Quattro Libri dell'Architettura (Four Books on Architecture)* in 1570, he thought stairs were of sufficient importance as to warrant an entire chapter of their own; 'Of Stairs, and the Various Kinds of Them; and of the Number and Size of the Steps'⁵¹⁹. In his writings Palladio includes examples and praise; for the use of the winding staircase in narrow spaces and the incorporation into such staircases the central void to enable good illumination. He admires the three interior spiral stair cases in the portico of Pompei in Rome (leading on to the Piazza Giodea) as 'very commendable for the manner in

⁵¹⁵ Laras, A. (2005). *Gardens of Italy*. p39. Lazzaro, C. (1990). *The Italian Renaissance garden*. pp99, 219-220.

⁵¹⁶ Weiss, A. S. (1995). *Mirror of infinity: the French formal garden and 17th-century metaphysics*. pp14-15. Tongiorgi Tomasi, L. (2005). *Gardens of Knowledge and the Republique des Gens de Sciences*. In Conan, M. (Ed.), *Baroque garden cultures: emulation, sublimation, subversion*. (p92.) Plumptre, G. (1993). *The water garden: styles, designs and visions*. p28. Weiss, A. S. (1995). *Mirror of infinity: the French formal garden and 17th-century metaphysics*. pp14-15.

⁵¹⁷ Masson, G. (2009). *Italian Gardens*. p83.

⁵¹⁸ Templer, J. A. (1992). *The staircase: history and theories*. pp49, 74. Palladio, A., Tavernor, R. and Schofield, R. [Trans.s]. (2002). *The four books on architecture*. pp66-70. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p115. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p153. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. p156.

which they are lit from above' and which were 'built on columns so that the light spread itself evenly throughout'. He notes such intriguing designs as the triangular staircase of Santa Maria Rotonda in Venice, and he refers to the then relatively novel oval helical staircase as 'very graceful and delightful to look at'⁵²⁰. He described the Stair of King Francis I at Chambord (see page 55, Figure 53.) as a 'beautiful and novel invention', and was so taken with it that he went on to detail elevations and plans to explain the workings of its double helix and the manner in which, while users of each flight may still view each other through the open well, they will not cross paths and inconvenience one another while ascending or descending⁵²¹. This recognition of the stair as more than purely functional construction is evident in both Palladio's own intricately conceived paper designs for twin staircases and open-welled elliptical stairs and the apparent pleasure with which he recalls the successfully elegant execution of one of his own designs - 'I made a staircase with a void in the middle for the monastery of Carita in Venice which turned out marvellously' - although it is hard not to speculate that there is almost a hint of delighted surprise (and possibly relief) to the commentary also, suggesting that it may have been something of an experiment⁵²². These studies demonstrate that Palladio was very aware of the inherent potential of the stair to create an architecture of poetic travel as opposed to merely a construction of effective transit⁵²³.

Figure 68: Palladio's oval stair for the monastery of Santa Maria della Carita, 1561

Figure 69: The stair at Carita from above..(The monastery is now the Accademia di Belle Arti)

Of the ten books of architecture that Palladio conceived of for his treatise (such that it would complement those of Vitruvius and Alberti), only four were published in his lifetime, but these were concerned with the general principles of architecture, temples, public buildings and private buildings respectively (the others were to be on theatres, amphitheatres, arches, baths, aqueducts and fortifications)⁵²⁴. Palladio was unusual in devoting one of his books to residential architecture. By doing so he placed far greater emphasis upon it than either Vitruvius or Alberti - or any of his contemporaries for that matter - but he believed it to be as important as any civic, religious or public work⁵²⁵. Furthermore, whereas until now, domestic architectural design had tended to stress the importance of the interior and civic architectural design that of the exterior, Palladio applied the same emphasis and treatment to both, and irrespective of whether they were situated in the town or country⁵²⁶. Although many of the country villas he designed were working farms in addition to residences, their wealthy owners required their buildings to display as much elegance and taste as any of their town houses⁵²⁷. Thus although Palladio designed his country villas such as the Villa Chiericati in the Veneto (1550s) and the Villa Cornaro in Pimino Dese (1552) as practical, working enterprises, he also designed them with as much attention to a classical aesthetic and as a great level of refinement as any of the civic and public buildings he architected in the city⁵²⁸. To that end, well informed by his studies of unusual stairs such as those of Francis I at Chambord, and well aware of the designs of the great garden architecture of Bramante and his contemporaries, Palladio used external stairs frequently as a means of creating a formal approach to his villas, so as to emphasise the grandeur and impressiveness of the house and reinforce the elegance of his symmetrical façades⁵²⁹. Use of the exterior stair as a device for elevating the stature of the house, whether great or small, became a notable feature of Palladio's designs relatively early in his career, as for example at the Villa Godi (1537-1542), the Villa Gazzotti 1542-1543 and the Villa Caldogno (1548-52), although there are indications that the Villa Gazzotti, including the stair, was not finished entirely to Palladio's original design⁵³⁰.

⁵²⁰ Palladio, A., Tavernor, R. and Schofield, R. [Trans.s]. (2002). *The four books on architecture*. p70. Templer, J. A. (1992). *The staircase: history and theories*. p74. Spens, M. (1995). *Staircases: Detail in Building*. pp7-9.
⁵²¹ Templer, J. A. (1992). *The staircase: history and theories*. 76. Palladio, A., Tavernor, R. and Schofield, R. [Trans.s]. (2002). *The four books on architecture*. p70.
⁵²² Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp152, 154. Templer, J. A. (1992). *The staircase: history and theories*. p72.
⁵²³ Templer, J. A. (1992). *The staircase: history and theories*. p49, 62, 142. Palladio, A., Tavernor, R. and Schofield, R. [Trans.s]. (2002). *The four books on architecture*. pp67, 70.

⁵²⁴ Howard, D. (1980). *Four Centuries of Literature on Palladio*. p226. Mitrovic, B. (2004). *Learning from Palladio*. p35.
⁵²⁵ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp117-118.
⁵²⁶ Kostof, S. (1995). *A history of architecture: settings and rituals*. p480. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p129.
⁵²⁷ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp116-117. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p129.
⁵²⁸ Kostof, S. (1995). *A history of architecture: settings and rituals*. pp479-480.
⁵²⁹ Mitrovic, B. (2004). *Learning from Palladio*. p39. Templer, J. A. (1992). *The staircase: histories and theories*. p49. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p18.
⁵³⁰ Williams, K, Giaconi, G. and Palladio, A. (2003). *The villas of Palladio*. pp26-27, 36-37, 56-57.

By the time Palladio completed the Villa Capra (La Rotonda) – his widely acknowledged masterpiece - in the 1560s, which was situated on a hilltop to enjoy ‘the most lovely views on all sides’, the single exterior stair had multiplied to four, one for each façade⁵³¹.

Figure 70: Villa Godi, 1537-1542, Andrea Palladio

Figure 71: Villa Chiericati, 1550s, Andrea Palladio

Figure 72: Villa Cornaro, 1552, Andrea Palladio

Figure 73: Villa Capra (La Rotonda), Ca. 1560s, Andrea Palladio

1.3.3 Unpardonable Errors and Interior Issues

Palladio's approach would seem to indicate that he appeared to have identified the stair as offering more spatial and experiential potential than many other architects (including Vitruvius and Alberti) had previously intuited or thought relevant⁵³². However, despite appreciative studies of the work of others (both within the garden and without) and his own frequent use of the exterior stair to create approach, Palladio was not inclined to extend this interest and appreciation of experiential potential to the *interior* stairs of his residences. Here the stair still appeared a somewhat subdued figure and remained marginalised, apparently as problematic for the impact its presence had upon the symmetry of the plan⁵³³. Palladio was extremely emphatic as to the woe that an ill thought out stair could inflict upon the building that it existed to serve, precluding all discussion of the stair in ‘Chapter 1 Of Stair-cases’, with the urgent instruction that;

GREAT Care ought to be taken in placing of the Stair-Café in any Building; and therefore Stair-Cafes ought to be defcribed, and accounted for juftly, when the Plan of a Building is made; and for want of this, fometimes unpardonable Errors have been committed; such as having a blind Stair-Café to a large Houfe, or, on the other Hand, to have a large fpacious Stair-Café to a little one. *Palladio*⁵³⁴.

This dire warning as to the possibility of stair related carelessness leading to the irredeemable ruination of the entire house, sets the tone for the domestic interior staircase as being every bit as alarmingly complicated, capricious and unwieldy a creature as Sir Henry Wotton's previously encountered description of it as ‘curious’, might imply. Palladio goes on to document the means by which various ‘unpardonable Errors’ may be avoided by spelling out very clearly the manner in which staircases should be handled⁵³⁵. This, it turns out, is especially crucial with regard to their situation as they ‘must not get in the way’ and failure to select an appropriate site for them means that they will do exactly that and thus ‘interfere with the rest of the building’⁵³⁶. Aside from locational inconvenience however, ‘interference’ also includes being readily *visible*. Like Alberti before him, Palladio discusses the ‘tre apertura’, the door to the staircase, the window that lights it and the opening in the floor to which the

⁵³¹ Kostof, S. (1995). *A history of architecture: settings and rituals*. pp480-482. Templer, J.A. (1992). *The staircase: histories and theories*. p49.

⁵³² Templer, J. A. (1992). *The staircase: history and theories*. px.

⁵³³ Spens, M. (1995). *Staircases: Detail in Building*. p7-8. Gwilt, J. (1842). *An encyclopaedia of architecture: historical, theoretical, and practical*. p764. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p18. Palladio, A., Tavernor, R. and Schofield, R. [Trans.s]. (2002). *The four books on architecture*. pp12, 124, 132. Mitrovic, B. (2004). *Learning from Palladio*. pp73, 75.

⁵³⁴ Palladio, A. (1767). In Salmon, W. *Palladio Londinensis*. p113. (112-119.) Palladio, A., Tavernor, R. and Schofield, R. [Trans.s]. (2002). *The four books on architecture*. p66.

⁵³⁵ Palladio, A., Tavernor, R. and Schofield, R. [Trans.s]. (2002). *The four books on architecture*. pp66-70.

⁵³⁶ Palladio, A., Tavernor, R. and Schofield, R. [Trans.s]. (2002). *The four books on architecture*. p66.

stair leads, but is adamant that although the door should be situated so that it can be seen the stairs themselves should not be⁵³⁷. The stair then is a critical issue with regards to the interior spatial planning of the house and should under no circumstances be permitted to invade it at will, trailing a dreadful disorder of alarming asymmetries and disproportionate disharmonies in its wake, but must be wrangled into invisible submission. The prospect of such unpardonable errors that may otherwise be committed as a result of failure to wrestle the interior stair into a suitably subdued state, goes some way then towards explaining Palladio's typical treatment of it, which was to hide it out of sight, either by enclosing it in a separate compartment or room or an unobtrusive, discreet corner, or by situating it outside of the house entirely⁵³⁸. The stair's purpose as useful device was to service the smooth functioning of the household in terms of the circulation of both owners and their servants⁵³⁹. Providing it could serve its function conveniently and do so as unobtrusively as possible it need be of no further consequence⁵⁴⁰.

Figure 74: Plan, Villa Capra (La Rotonda)

Figure 76: Plan, Villa Cornaro

Figure 75: Plan, Villa Chiericati

As with many of Palladio's villas, the interior stairs of the Villas Capra, Cornaro and Chiericati are all enclosed neatly out of sight.

Despite the gradual sidling of the stair from the garden up to the house then, as far as the interior went, the stair in mid sixteenth century Italy still remained problematic; an annoying hindrance to the agreeable arrangement of the interior plan⁵⁴¹. The stair could contribute to the exterior of the house as aesthetic emphasiser of the whole, thus enhancing the experience of approach, and inside the house as servant space to a room, a room as a distinct *destination*, but it could not be architecture in itself. It must remain instead either an attachment to or an object within the greater whole - to be displayed if display could enhance the whole - and to be hidden inside where it could not. Either way the stair remained effectively divorced from the house, even while serving and subservient to it - a somewhat tiresome constructional necessity unfortunately required for the creation of real architecture - but one which despite its lowly status must also be Handled With Care as it possessed if let loose, tiger-like, the potential to wreak irreparable destruction upon the serenity of the household. To a large extent then, the excitable curiosities and experimental notions of such stairs as those at Chambord, at Blois, the Laurentian Library and Palladio's own efforts for the monastery of Carita that "turned out marvellously"; remained infrequent, oddly rarefied curiosities. Situated in the grandest of the grand houses, the pallazi of Italy the chateaus of France, the schlosses of Austria and within monasteries throughout Europe, they were praised and appreciated for their novelty, radical innovation, technical excellence and superb ingenuity, but despite this evidence of the stair's poetic potential to contribute to spatial experience and its gradual encroachment upon the domain of the house, it remained largely unapplied to the house interior.

⁵³⁷ Gwilt, J. (1842). *An encyclopaedia of architecture: historical, theoretical, and practical*. p764. Palladio, A., Tavernor, R. and Schofield, R. [Trans.s]. (2002). *The four books on architecture*. pp66.

⁵³⁸ Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p18. Mitrovic, B. (2004). *Learning from Palladio*. p39. Palladio, A., Tavernor, R. and Schofield, R. [Trans.s]. (2002). *The four books on architecture*. pp87, 124, 131, 133-134, 149, 153, 155, 157, 340, 377.

⁵³⁹ Palladio, A., Tavernor, R. and Schofield, R. [Trans.s]. (2002). *The four books on architecture*. pp12, 67, 70, 105, 142, 253. Mitrovic, B. (2004). *Learning from Palladio*. p76.

⁵⁴⁰ Mitrovic, B. (2004). *Learning from Palladio*. p39.

⁵⁴¹ Templer, J. A. (1992). *The staircase: history and theories*. px. Mitrovic, B. (2004). *Learning from Palladio*. p39.

1.3.4 A Magnificent Change Is As Good As The Best?

This situation of the stair as (literally) outsider had been particularly evident in Venice in the early fifteenth century. Here the stair had been an unimportant fixture of the house and was as frequently situated outside of it as inside, a situation then furthered as a result of the Venetian tendency to turn houses into apartments⁵⁴². These apartments may be occupied by multiple members of the same family, or different families, and the provision of exterior stairs enabled the servicing of multiple apartments whilst conserving interior space and maintaining greater privacy⁵⁴³. In the mid - late fifteenth century however, in response to the increasingly filthy and malodorous streets and the damp and periodic flooding, the principle reception rooms of the great buildings (in both houses and grand palaces) were increasing frequently re-situated from the ground floor to the first floor – then termed the Piano Nobile⁵⁴⁴. By the beginning of the seventeenth century what had been a response to specific practical needs had spread, becoming fashionable throughout Europe⁵⁴⁵. This relocation dramatically increased the functional importance of the staircase as the means by which the reception rooms were reached and consequently, the level of meaning invested in it and the grandeur and quantity of space dedicated to it⁵⁴⁶.

This re-situating also happened to coincide with a change of thought - with the notion of building for honour - that had begun in Florence but which had quickly become widespread across Italy⁵⁴⁷. Whereas previously medieval Christian Franciscan thought (especially strong in Florence) had espoused poverty and disavowed the manifestation of wealth as a mark of vulgarity, vanity and poor taste, by the time Alberti's *De Re Aedificatoria* was published in 1452 the attitude had changed to one where such displays were entirely acceptable and in fact expected; magnificence was a virtue, not a vice, and it had become the duty of the noble and wealthy to display this as demonstrating the collective magnificence of the city⁵⁴⁸.

Architecture, as one of the more conspicuous means of displaying wealth was particularly favoured, and the desire to impress is particularly evident in the increase in patronage of architecture - especially palace building - from this time⁵⁴⁹. Alberti was actually quite explicit about this, writing in *De Re* that 'the magnificence of the house should be adapted to the dignity of the owner.' and in his tract *Della Famiglia* (*On the family*, 1435-44) that

"Men of publick Spirits approve and rejoice when you have raised a fine Wall or Portico, and adorned it with Portals, Columns, and a hand-some Roof, knowing you have thereby not only served yourself, but them too, having by this generous Use of your Wealth, gained an addition of great Honour to yourself, your Family, your Descendants, and your City"⁵⁵⁰.

The beauty and grandeur of the palazzo, even though private, were thus intended to be a source of pride for all, and the great man revealed himself through architecture (according to contemporary accounts the not so great revealed themselves all too often by begging or starving inconveniently in the street)⁵⁵¹. The fact of course that it also was a means of demonstrating individual status probably did not hinder the enthusiasm with which this change in outlook was embraced⁵⁵². Although the emerging merchant class of newly wealthy merchants and bankers had been more used to thrift than expenditure (especially on non-profitable ventures such as architecture) the opportunity to garner status was very attractive⁵⁵³. They possessed the means of acquiring more fitting residences that reflected their new found status, and now that Florentine notions of poverty had conveniently been swept aside, they desired to⁵⁵⁴. Prominent families such as the Strozzi's and the Medici's wished to impress and intimidate their contemporaries and political rivals by publicly demonstrating their wealth as obviously as possible, and rushed to do so - Cosimo Medici

⁵⁴² Schulz, J. (2004). *The new palaces of Medieval Venice*. pp11, 18, 26-27, 40, 42-44.98-99, 127, 154-156, 162. Gwilt, J. (1842). *An encyclopaedia of architecture: historical, theoretical, and practical*. pp763-764. Kostof, S. (1995). *A history of architecture: settings and rituals*. p471.

⁵⁴³ Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p227. Good, R. (2009). *Double staircases and the vertical distribution of housing in Venice 1450–1600*. pp73-74, 8, 83. Schulz, J. (2004). *The new palaces of Medieval Venice*. p41.

⁵⁴⁴ Good, R. (2009). *Double staircases and the vertical distribution of housing in Venice 1450–1600*. p75. Schulz, J. (2004). *The new palaces of Medieval Venice*. p27. Gwilt, J. (1842). *An encyclopaedia of architecture: historical, theoretical, and practical*. p764.

⁵⁴⁵ Templer, J. A. (1992). *The staircase : history and theories*. pp42, 120.

⁵⁴⁶ Templer, J. A. (1992). *The staircase : history and theories*. pp116, 120.

⁵⁴⁷ Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p227.

⁵⁴⁸ Pellecchia, L. (1989). *The Patron's Role in the Production of Architecture: Bartolomeo Scala and the Scala Palace*. pp. 258-291. Kostof, S. (1995). *A history of architecture: settings and rituals*. p379. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p227. Gelernter, M. (1995). Sources of architectural form: a critical history of Western design theory. p93. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp403, 404-405. Schulz, J. (2004). *The new palaces of Medieval Venice*. pp39, 101. Ehrlich, T. L. (2005). Pastoral Landscape and Social Politics in Baroque

Rome. In Conan, M. (Ed.), *Baroque garden cultures: emulation, sublimation, subversion*. (p131.) Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. p259. Welch, E. (2002). *Public magnificence and private display: Giovanni Pontano's de splendore (1498) and the domestic arts*. pp214, 218.

⁵⁴⁹ Pellecchia, L. (1989). *The Patron's Role in the Production of Architecture: Bartolomeo Scala and the Scala Palace*. pp. 258-291.

⁵⁵⁰ Fraser Jenkins, A. D. (1970). *Cosimo de' Medici's Patronage of Architecture and the Theory of Magnificence*. p167. Kostof, S. (1995). *A history of architecture: settings and rituals*. p379.

⁵⁵¹ Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p227. Pellecchia, L. (1989). *The Patron's Role in the Production of Architecture: Bartolomeo Scala and the Scala Palace*. pp. 258-291. Fraser Jenkins, A. D. (1970). *Cosimo de' Medici's Patronage of Architecture and the Theory of Magnificence*. p167.

⁵⁵² Nichols, T. (2007). *Secular charity, sacred poverty: picturing the poor in Renaissance Venice*. pp139-149. Fraser Jenkins, A. D. (1970). *Cosimo de' Medici's Patronage of Architecture and the Theory of Magnificence*. p167.

⁵⁵³ Kostof, S. (1995). *A history of architecture: settings and rituals*. p379. Schulz, J. (2004). *The new palaces of Medieval Venice*. p34.

⁵⁵⁴ Cook, P. (1967). *Architecture: action and plan*. p32. Kostof, S. (1995). *A history of architecture: settings and rituals*. p379. Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. p259.

(1389-1464) in particular⁵⁵⁵. Efforts by others to keep pace ensured that an increased patronage of architecture beyond the traditional remit of the nobility and the Catholic Church (which had fully embraced magnificence from the mid fifteenth century as a means of demonstrating Auctoritas Ecclesias - the authority of the church), ensued⁵⁵⁶. Architecture flourished and irrespective as to whether the intention was to demonstrate collective magnificence or personal status, the end result was the development of a climate in which architectural patronage was not just encouraged but expected; the patron's role in the production of architecture was promoted and assured⁵⁵⁷. Men of 'publick spirits' (and private desire) could indeed sleep well at night knowing that in the munificent raising of (fine) walls and Porticos, the generous adorning of portals and columns, and the liberal hand-soming of roofs, they could go to their dreams with all the satisfaction that money *could* buy, the church *did* sanction and their contemporaries might *envy*⁵⁵⁸. Amongst this magnificent and benevolent architectural display however, the only thing conspicuous about the stair was, once again as in Vitruvian times, its absence. Somewhere, amongst this voracious stampede of conspicuous architectural consumption and extravagant status chasing, the stair was still *scala non grata*.

Figure 77: The Ca'd'Oro (the Palazzo Santa Sofia), 1428-1430, built on the Grand Canal in Venice for the powerful Contarini family by father and son architects Giovanni and Bartolomeo Bon

⁵⁵⁵ Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p183. Pellicchia, L. (1989). *The Patron's Role in the Production of Architecture: Bartolomeo Scala and the Scala Palace*. pp. 258-291. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p15. Fraser Jenkins, A. D. (1970). *Cosimo de' Medici's Patronage of Architecture and the Theory of Magnificence*. p167. Schulz, J. (2004). *The new palaces of Medieval Venice*. pp40, 76. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p115-116.

⁵⁵⁶ Toman, R. (1998). *Baroque: architecture, sculpture painting*. p13. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p224. Fraser Jenkins, A. D. (1970) *Cosimo de' Medici's Patronage of Architecture and the Theory of Magnificence*. p162. Schulz, J. (2004). *The new palaces of Medieval Venice*. p38, 43-44.

⁵⁵⁷ Fraser Jenkins, A. D. (1970). *Cosimo de' Medici's Patronage of Architecture and the Theory of Magnificence*. p165. Kostof, S. (1995). *A history of architecture: settings and rituals*. p379. Welch, E. (2002). *Public magnificence and private display: Giovanni Pontano's de splendore (1498) and the domestic arts*. pp212.

⁵⁵⁸ Clark, K. (1971). *Civilisation*. p192.

1.3.5 The Piano Nobile: A Processional Prompt and A Curious Question

This subservience of the stair to the plan, via it's relegation to encasement, a discreet corner somewhere, or in Venice, the courtyard, was set to change however⁵⁵⁹. The increasing fashion for the relocation for the principle rooms from the ground to the first floor that had first begun in Venice in the mid to late fifteenth century but which by the beginning of the seventeenth century had spread throughout Italy, was a change which necessitated a rethink as to the function and importance of the interior stair and its relationship to the building⁵⁶⁰. By this time, ideals of space had changed also. Whereas Alberti and Palladio favoured the typical Renaissance compartmentalisation of rooms as autonomously functioning units of space. within a greater, harmonious whole, the later Renaissance designers of the Baroque wished for a more spirited sensation in their interiors than that afforded by the orderly serenity of classicism⁵⁶¹. They wanted grandeur, drama, spectacle and vivacity⁵⁶². The shifting of the principle rooms to the first floor meant that the connection of the formal exterior approach to the Piano Nobile was absolutely critical to achieving this drama and spectacle – but how to effect this architecturally? It could not be produced through order, enclosure and separation - openness – spatial and visual connection was required. The helical stair was generally considered too restrictive therefore. Even though the introduction of the interior light well had opened it up vertically this also had the effect of revealing the horizontal constraints; the stair could still appear to be a vertical tunnel that constrained any horizontal extension severely, both spatially and visually⁵⁶³. In an era where the artistic flavour of the day was preoccupied with representing the appearance of infinity and grandiosity, seventeenth century designers wished for something that was far less visually restrictive (and technically demanding) as a means of effecting vertical circulation (of the households principles at least; servants were simply part of the mechanism of the house necessary to ensure its smooth functioning but servants did not need to be seen, and neither did their circulatory space which could therefore remain tidily hidden)⁵⁶⁴. Whereas Alberti and Palladio had largely eschewed the diagonal (except for the latter's favouring the use of the portico and pediment)

⁵⁵⁹ Schulz, J. (2004). *The new palaces of Medieval Venice*. p181.

⁵⁶⁰ Good, R. (2009). *Double staircases and the vertical distribution of housing in Venice 1450–1600*. pp76-77, 83. Schulz, J. (2004). *The new palaces of Medieval Venice*. p44. Cook, P. (1967). *Architecture: action and plan*. p32. Gwilt, J. (1842). *An encyclopaedia of architecture: historical, theoretical, and practical*. p207. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p6.

⁵⁶¹ Kostof, S. (1977). *The architect: chapters in the history of the profession*. p157.

⁵⁶² Schulz, J. (2004). *The new palaces of Medieval Venice*. pp44, 182. Kostof, S. (1995). *A history of architecture: settings and rituals*. p599.

⁵⁶³ Templar, J. A. (1992). *The staircase: history and theories*. p72. Schulz, J. (2004). *The new palaces of Medieval Venice*. p40.

⁵⁶⁴ Schulz, J. (2004). *The new palaces of Medieval Venice*. pp179, 208-209. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. pp57-58. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p9.

and therefore the stair, preferring in the interior that it kept out of sight) Baroque designers were fascinated by the dynamism and sense of movement that it could convey, and for which it was particularly favoured by Baroque artists⁵⁶⁵. The straight flight stair, freed from the restrictive walls of the passage or encasement and compartmentalisation, as exemplified by Michelangelo's plastic fantasy of the Laurentian Library Ricetto, was the key to creating the desired sense of processional drama but the manner as to how might this be best exploited remained open to question⁵⁶⁶.

Figure 78: The ceiling of the Church of Sant' Ignazio, Rome, Saint Ignatius being received into heaven, 1691-94, by Andrea Pozzo

Figure 79: Painted dome, the Church of Sant' Ignazio, Rome, 1685, by Andrea Pozzo

Figure 80: Reggia di Portici, Naples, Italy., Frescoes, 1750, by Vincenzo Re

In seeking solutions to what had become *the* architectural question of the era, architects in Italy, France, Spain, Germany, Austria and England turned to the great landscaped gardens of Bramante, Vignola and Ligorio⁵⁶⁷. How could the variety, richness and spatial articulation of the dramatic garden stairs be replicated within the interior *without* imposing also the compartmentalisation and restraint that would prevent their spectacle from being fully visible?⁵⁶⁸ Here the Baroque era's intense fascination for, and delight with, the theatre and performance also became a source of inspiration⁵⁶⁹. The study of the laws of perspective and foreshortening that had originated with the great architect Filippo Brunelleschi (1377-1446) and which had been refined and documented by Alberti in his treatise *Della Pittura* (1434-35) had been studied and used by Baroque artists to create the most fabulous *tromp l'oeil* paintings, through which, when applied to vast scales, entire ceilings and walls could be disappeared as if by magic⁵⁷⁰. These strategies were rapidly adopted for the theatre also and led to the creation of intricately contrived stage sets that generated splendid illusions of apparently infinite vistas in dramatic fantasy worlds, for the enactment of elaborate plots, aided by extravagant mechanical devices and lavish costuming⁵⁷¹.

These extravagant spectacles of fantastical theatrical and operatic entertainment were hugely popular among the wealthy at this time and set designers, such as Gisuseppe Bibiena (1696 – 1756), were highly acclaimed for their skills⁵⁷². Filippo Juvarra (1678-1736) began his career in Rome as a set designer and was subsequently employed to replicate his stage skills within the domestic interior after which he went to become one of foremost Italian architects of his era⁵⁷³.

⁵⁶⁷ Templer, J. A. (1992). *The staircase: history and theories*. pp34, 113.

⁵⁶⁸ Kostof, S. (1977). *The architect: chapters in the history of the profession*. p157. Templer, J. A. (1992). *The staircase: history and theories*. pp102, 111.

⁵⁶⁹ Pelletier, L. (2006). *Architecture in words: theatre, language and the sensuous space of architecture*. pp21-24, 26-28, 46, 61, 89-90. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p181. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. p53. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. pp38-39.

⁵⁷⁰ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p102-105. Padovan, R. (1999). *Proportion science philosophy architecture*. p214. Exner, U. and Pressel, D. (2009). *Spatial Design*. pp33-34. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. pp141-143, 145-149. Harbison, R. (2009). *Travels in the history of architecture*. pp140, 195. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. pp57-58. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p40.

⁵⁷¹ Templer, J. A. (1992). *The staircase: history and theories*. p140-141. Harries, K. (2000). *The ethical function of architecture*. pp322-323. Pelletier, L. (2006). *Architecture in words: theatre, language and the sensuous space of architecture*. pp27, 30, 32, 34-35. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. pp251-252. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. pp51-52.

⁵⁷² Pelletier, L. (2006). *Architecture in words: theatre, language and the sensuous space of architecture*. pp26-27, 43. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. pp252-253.

⁵⁷³ Pile, J. (2009). *A history of interior design*. p145. Templer, J. A. (1992). *The staircase* : pp11, 140.

⁵⁶⁵ Jormakka, K. (2003). *Basics design methods*. p65. Templer, J. A. (1992). *The staircase: history and theories*. p28. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p18.

⁵⁶⁶ Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp6, 9. Templer, J. A. (1992). *The staircase: history and theories*. pp32, 34, 76, 116, 122.

Figure 81: Italian palace portico with stair and fountain, by Giuseppe Galli Bibiena.

Figure 82: Stage set featuring grand stair by Giuseppe Galli Bibiena.

1.3.6 Extravagant Interior? Fantastical Theatre! To Infinity and Beyond ...

With a now unprecedented emphasis allocated to the passage and ascent through the house, the stair, - or at least the principle stair in the houses of the wealthy - rather than simply remaining as the means of transiting from one floor to another, could now be the equal of all other architectural elements previously emphasised for such purposes; the façade, portico and reception rooms, and frequently became the principle around which all else was ordered⁵⁷⁴. The stair was required to be elegant, tasteful and splendid – a fitting stage for the ceremonial arrival and procession of guests from the entryway to the great hall above - and designers such as Juvarra were required to create elaborate stairways of great artistry and theatricality for their noble and wealthy clients, unlike anything that had been attempted or seen before⁵⁷⁵. Their designs exploited the architectural possibilities of stairs to achieve a sophisticated level of spatial manipulation that, rather than simply connecting adjacent vertical spaces, united and integrated them⁵⁷⁶. As a result new spatial configurations and relationships could flourish to create affective architectural experiences of great drama in new and startling ways and the space given over to the stairs housing, and the level of grandeur afforded it, began to exceed all previous attentions⁵⁷⁷. Safe from the elemental damage that had restricted the material choices of exterior stairs, the interior staircases became sumptuously refined and ornate art objects resplendent with rich materials; polished marble, luxurious carpets and lit with crystal chandeliers⁵⁷⁸. As in the theatre, their increasingly fantastical nature was emphasised by the frequent inclusion of equally fantastical painted ceilings transformed into idealised, infinite, artificial skies, while vast gilded mirrors, copious recesses, niches, sculptures and other such illusionary devices were used to dissolve away the surrounding walls⁵⁷⁹. The performative theatricality and processional nature of the experience was also reinforced by alterations to the stair dimensions. Fashions of the time required women of distinction to sport extravagant gowns of wide circumference and the stair must proceed at a gentle pace to permit a safe and appropriately dignified journey⁵⁸⁰.

⁵⁷⁴ Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p11. Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. p259. Templer, J. A. (1992). *The staircase: history and theories*. p95.

⁵⁷⁵ Neville, J. (1999). *Dance and the garden: moving and static choreography in Renaissance Europe*. p821. Templer, J. A. (1992). *The staircase: history and theories*. p127.

⁵⁷⁶ Templer, J. A. (1992). *The staircase: history and theories*. p128.

⁵⁷⁷ Spens, M. (1995). *Staircases: Detail in Building*. p8. Templer, J. A. (1992). *The staircase: history and theories*. pp34, 120. Templer, J. A. (1992). *The staircase: history and theories*. pp124-125. Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. p259.

⁵⁷⁸ Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p131.

⁵⁷⁹ Habermann, K. J. (2003). *Staircases: design and construction*. pp18, 102. Templer, J. A. (1992). *The staircase: history and theories*. p131. Pelletier, L. (2006). *Architecture in words: theatre, language and the sensuous space of architecture*. pp21-22. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p39. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. pp184, 326. Harbison, R. (2009). *Travels in the history of architecture*. p195.

⁵⁸⁰ Templer, J. A. (1992). *The staircase: history and theories*. p25. Condra, J. (2008). *The Greenwood*

Risers became shallower and treads became wider, to accommodate this more stately gait, further slowing the journey and emphasising the ritual of its dramatic progression⁵⁸¹. Participants in this theatrical drama were guided by the stair through a controlled sequential experience in which they became both viewed and viewer, as they made their way from the grand exterior stairs of the entranceway, up the now even grander interior stair, to the reception rooms above⁵⁸². The potential of a grandiose stair to contribute to a dramatic spatial experience had been recognised as significant enough to be transplanted from the garden, up to the house, and now, into it⁵⁸³.

Figure 83: The Scalone Palazzo Madama
Torina, Turin, Italy, by Filippo Juvarra.

Figure 84: The royal staircase of the Reggia di Caserta,
1752-1780. By Luigi Vanvitelli (1700-1773) for Charles VII
of Naples (1716-1788).

Encyclopedia of Clothing Through World History: 1501-1800. pp158-159.
⁵⁸¹ Templer, J. A. (1992). *The staircase: history and theories*. p127. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p49.
⁵⁸² Spens, M. (1995). *Staircases: Detail in Building*. p8, 10-11.
⁵⁸³ Templer, J. A. (1992). *The staircase: history and theories*. p113.

1.3.7 Splendid Isolation – A Curious Conundrum

By the early seventeenth century, the attention lavished upon the principle interior stair as solution to the architectural problem of connecting the exterior of the house with the upper interior had already become so intense that that it frequently far exceeded that given to the building that housed it⁵⁸⁴. If magnificence was the province of the exterior, then splendour was its interior compadre⁵⁸⁵. The Neapolitan humanist and writer Giovanni Pontano had gone to some trouble in the 1490s to instruct as to the difference between the two and the meaning of both, deciding that the house, buildings in general in fact – as substantial, large, permanent items - belonged to the realm of magnificence while those that were more transient – objects such as art, clothes and furnishings belonged to the splendid⁵⁸⁶. As the means of creating an appropriate sense of journey and drama through the owners domain (and showing off their wealth and taste) therefore the stair had become *the* mark of its owner's distinction and was to be feted and celebrated by all means possible, no matter how extravagant. Rather than the silent servant of medieval times, condemned to stand unheeded in a corner like a unwelcome party guest while the ribbed vault it enabled received all the acclaim, or the unruly beast of Palladio's era, encaged in a cupboard lest let loose it tear up the house, the Baroque grand entrance stair was by comparison, the *star* of the show, the whole point of the exercise, the guest in who's honour the party had been thrown⁵⁸⁷. If the opulent extravaganza the stair had become perfectly embodied the Baroque architectural theory that every building element be allowed expression in and of itself, even if it did then become completely unrelated to its surroundings, what concern was this? It was *supposed* to be splendid; any disjunction between the stair and the building it (apparently) existed to serve, only focused further attention *upon* its splendour and therefore further elevated the stature of the owner responsible for its creation⁵⁸⁸. Alberti's previous cautions a mere one hundred and fifty years before as to the most appropriate staircase management technique being that they comprise as few as possible and be as economic as dignity would permit would appear to have been cheerfully surpassed⁵⁸⁹.

⁵⁸⁴ Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. pp203, 259. Blanc. A. and Blanc, S. (2001). *Stairs, second edition*. p11.
⁵⁸⁵ Fraser Jenkins, A. D. (1970). *Cosimo de' Medici's Patronage of Architecture and the Theory of Magnificence*. p167. Kostof, S. (1995). *A history of architecture: settings and rituals*. p379. Schulz, J. (2004). *The new palaces of Medieval Venice*. p34. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p15.
⁵⁸⁶ Welch, E. (2002). *Public magnificence and private display: Giovanni Pontano's de splendore (1498) and the domestic arts*. pp211, 213-214.
⁵⁸⁷ Blanc. A. and Blanc, S. (2001). *Stairs, second edition*. pp11, 19. Templer, J. A. (1992). *The staircase: history and theories*. p34. Viollet-le-Duc, E. (1875). *Discourses on architecture*. p203.
⁵⁸⁸ Schulz, J. (2004). *The new palaces of Medieval Venice*. p42-44. Templer, J. A. (1992). *The staircase: history and theories*. pp91-92. .
⁵⁸⁹ Kostof, S. (1995). *A history of architecture: settings and rituals*. p379. Habermann, K. J. (2003).

The Baroque desire for theatrical procession and display was pursued and indulged with the utmost enthusiasm through the stair become visual spectacle, and its domination over the whole⁵⁹⁰.

Figure 85: Grand stair of the Palazzo Farnese, Caprarole, ca 1584, by Giacomo Barozzi da Vignola

Figure 86: Palazzo Farnese, the open newel of the grand stair

Figure 87: Palazzo Farnese, the elaborate ceiling of the stair

Staircases: design and construction. p12. Alberti, L. B. and Rykwert, J. [trans.] (1991). *De re aedificatoria*. p31.

⁵⁹⁰ Spens, M. (1995). *Staircases: Detail in Building*. pp8, 10. Pelletier, L. (2006). *Architecture in words: theatre, language and the sensuous space of architecture*. p22. Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. p259.

1.3.8 Excessively Curious Curiously Excessive ?

Curious: interesting because of oddness or novelty; strange; unexpected

Of workmanship etc. highly detailed, intricate, or subtle⁵⁹¹

Now the vulgar cautions are these⁵⁹².

Given the voracity and rapidity of this unabashed seizing upon of the principle stair as not just means of vertical circulation but theatrical stage, technical solution, psychic fantasy, object d'art and material and sensory extravaganza combined, it is not altogether surprising that Sir Henry Wotton should have referred to the staircase in his treatise *The elements of architecture* (1624) as being 'curious'⁵⁹³. However the comment is interpreted, given the sheer number and complexity of services now expected of the stair besides effecting vertical access, and the additional difficulties of combining them, it would have been more surprising perhaps, had *someone*, at this point, *not* regarded it as curious. In a possible attempt to relieve at least some of the potential headaches involved in reconciling the simultaneous and competing demands of art, ergonomics, engineering, architecture, technology, culture, status, societal whims, politics, economy, ornament and a general taste for excess into a coherent solution, in his treatise Wotton took care to emphasise some of the less fantastical but nonetheless rather important 'vulgar cautions' with regard to staircase design that Palladio, (more preoccupied perhaps with preventing unforgivably inharmonious planning errors), had considered noteworthy but secondary. These cautions included detailing such necessary attentions as the provision of landings (both for intervals of rest and to ensure any falls were not as infinite as the stair was supposed to appear), plentiful light to enable safe navigation, the use of washes and gentle pitch to ease walking, the design of ample width to avoid collisions and the understanding of correct proportions for treads and risers to ensure safe, easy and comfortable use⁵⁹⁴.

⁵⁹¹ 'curious' (2007). *Shorter oxford English dictionary*. p584.

⁵⁹² Wotton, H. and Hard, F. (1968). *The elements of architecture*. p57

⁵⁹³ Wotton, H. and Hard, F. (1968). *The elements of architecture*. p57. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p14.

⁵⁹⁴ Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p14. Wotton, H. and Hard, F. (1968). *The elements of architecture*. p57. Wotton's exact instructions were that 'The breadth of every single Step or Staire bee never lesse than one foote (30.5 cm), nor more than eighteen inches (46 cm)', and 'that they excede by no meanes halfe a foot (15 cm) in their height or thickness; for Our Legges doe labor more in Elevation, than in Distension.' Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p14.

Sir Henry Wotton is probably better known nowadays for both his poetic accomplishments and diplomatic career than for his contribution to English architecture⁵⁹⁵. Although not a prolific writer of the former, his sonnets *On his mistress, the queen of Bohemia*, (1624) have remained perpetual favourites for their delicate sensitivity, while the biting wit and cynicism of his comment ‘an ambassador is an honest man sent abroad to lie for the good of his country’ assured him permanent memorialisation in European political history (although at the time it actually earned him the considerable displeasure of his employer, King James I, and a year’s equally considerable hard work to redeem himself back into favour again)⁵⁹⁶.

As a career diplomat, Wotton’s foray into architectural theory might seem a somewhat odd diversion but there are several reasons why this is not the case. By all accounts, Wotton possessed a keen intellect and was a man of tremendous scholarship, one of the leaders of his day in fact and (despite such occasional, carelessly indiscreet witticism as above) had been a great favourite of James I for his intelligence, wit, good-humour, modesty, scholarly talents and learning, for all of which, in addition to his diplomatic status, he was widely renowned⁵⁹⁷. *The elements of architecture* was actually written by him towards the end of his diplomatic career with the intent of retiring to England and securing employment (to support his application for the provostship of Eton College, Oxford University, an aim in which he was successful) and although achieved in some haste, was produced on the basis of Wotton’s many years experience abroad of his diplomatic residences in Italy and the extensive travels these had required of him throughout Europe⁵⁹⁸. Both circumstances had afforded him friendships and acquaintance with leading Renaissance scholars - theorists, architects, painters, sculptors and their patrons - statesmen, theologians, politicians and nobility – from whom he had acquired access to both theoretical texts and direct experience of their buildings – and upon which basis he had been able to effect his own architectural studies. As architecture was regarded in such circles as comprising a scientific endeavour and the profession of architecture as such had still yet to be established, such an intellectual

interest was regarded as an entirely laudable and eminently relevant scholarly pursuit for all gentlemen of learning at the time, as Wotton noted in his preface⁵⁹⁹. As a result, whilst greatly admiring of many of Vitruvius’s architectural premises (he was far less admiring of Vitruvius’ writings which he described bluntly as ill-expressed) Wotton was not without his own, exceptionally well informed opinions, and *The elements of architecture* is not, as is commonly, mistakenly thought, a direct translation of Vitruvius exact words in *De Architectura*, but a careful, critical evaluation of Vitruvian principles in terms of their relevance and application to a new context, time and purpose; the production of the Seventeenth Century English Country House⁶⁰⁰. In just one example of thoughtful pragmatism for instance, whilst Vitruvius praises the circle as the perfect form, Wotton, while acknowledging that this might be so, does not hesitate to point out that it does not generally form the most convenient of spaces for living purposes⁶⁰¹. The study was the first on architecture in English that was not solely a translation and was also one of very few concerning the visual arts in general that was published in seventeenth century England⁶⁰². For this, its thoughtful intelligence, clarity and relevance (in its thoroughly English – pragmatic - concern with practical matters of convenience and functionality as much as appearances), *The elements of architecture* was immensely popular⁶⁰³.

⁵⁹⁵ Wotton, H. and Hard, F. (1968). *The elements of architecture*. pxxvii. Van Eck, C. (2008). Statecraft or Stagecraft? English Paper Architecture in The Seventeenth Century. In Bonnemaison, S. and Macy, C. (Ed.[s].), *Festival architecture*. pp114-115. Mallgrave, H.F. [Ed.]. (2006). *Architectural theory: volume 1 an anthology from Vitruvius to 1870*. p90.

⁵⁹⁶ Kruff, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. p232. Smith, L. P. (1907). *The life and letters of Sir Henry Wotton*. p109. Wotton, H. and Hard, F. (1968). *The elements of architecture*. ppxi-xiii.

⁵⁹⁷ Smith, L. P. (1907). *The life and letters of Sir Henry Wotton*. pp3-4, 69, 112. Wotton, H. and Hard, F. (1968). *The elements of architecture*. ppixii-xiv, xx, xxii-xxiii, xxvi, xxvii, xxxiii.

⁵⁹⁸ Rybczynski, W. (2001). *The look of architecture*. p4. Mallgrave, H.F. [Ed.]. (2006). *Architectural theory: volume 1 an anthology from Vitruvius to 1870*. p89. Wotton, H. and Hard, F. (1968). *The elements of architecture*. pxi. Smith, L. P. (1907). *The life and letters of Sir Henry Wotton*. pp194, 199. Van Eck, C. (2008). Statecraft or Stagecraft? English Paper Architecture In The Seventeenth Century. In Bonnemaison, S. and Macy, C. (Ed.[s].), *Festival architecture*. p115.

⁵⁹⁹ Wotton, H. and Hard, F. (1968). *The elements of architecture*. ppxxxv, xliii, lviii, lxxv-lxxvii. Smith, L. P. (1907). *The life and letters of Sir Henry Wotton*. p195. Van Eck, C. (2008). Statecraft or Stagecraft? English Paper Architecture In The Seventeenth Century. In Bonnemaison, S. and Macy, C. (Ed.[s].), *Festival architecture*. p115. Mallgrave, H.F. [Ed.]. (2006). *Architectural theory: volume 1 an anthology from Vitruvius to 1870*. p90.

⁶⁰⁰ Mallgrave, H.F. [Ed.]. (2006). *Architectural theory: volume 1 an anthology from Vitruvius to 1870*. p90. Wotton, H. and Hard, F. (1968). *The elements of architecture*. ppxvi-xvii, lxxxi-lxxxii, preface, (unpanginated) Smith, L. P. (1907). *The life and letters of Sir Henry Wotton*. p195-196.

⁶⁰¹ Kruff, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. p231.

⁶⁰² Van Eck, C. (2008). Statecraft or Stagecraft? English Paper Architecture In The Seventeenth Century. In Bonnemaison, S. and Macy, C. (Ed.[s].), *Festival architecture*. p114. Kruff, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. p232. Wotton, H. and Hard, F. (1968). *The elements of architecture*. plxx.

⁶⁰³ Kruff, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. p231, 243. Wotton, H. and Hard, F. (1968). *The elements of architecture*. ppxvii, xxiv, lxix, lxxx.

Given this context and the intended aim and readership of Wotton's treatise - to provide a consultative manual for the gentleman builder of the English Country house - the inclusion of instruction as to successful stair-casery and the avoidance of basic mistakes - the vulgar cautions - especially given the excessively complicated expectations of the stair at this time, was entirely reasonable. What is less clear and therefore more interesting however, is Wotton's opinion as to the nature of the stair and his description of it as 'curious' which for an apparently simple comment raises some surprisingly, well, curious, questions. Why is a staircase 'curious'? This is an epithet applied to no other aspect of his architectural discussion. Further, what exactly is involved in the making of it, and by what measure is a staircase deemed complete? What for that matter is architecture – and what is the nature of a staircase a piece of it? These are questions that may yet be better addressed with the benefit of a little more historical hindsight.

1.4 Modern Matters

1.4.1 A Final Fling: Revelling In The Rococo – A Parisian Affair

With the beginning of the eighteenth century however, taste for the Baroque was beginning to wane. The artistic fancies of the era were turning to distaste and the lavish excesses of the age began to give way to a more 'restrained' aesthetic, at least, outside of France. In France, the Baroque remained very popular until the end of Louis XIV's reign and the Regence (1715-1723) - when Philip, Duke of Orleans was Regent to the infant Louis XV – during which period the more playful style of the Rococo developed. At this time, the court moved from Versailles to Paris and the emphasis upon grandiosity and formal rigidity relaxed. The previously stifling nature of court formality became more light-hearted and the Baroque style, with its weighty emphasis upon formally staged movement, drama and theatrics, began to seem overbearing and pompous⁶⁰⁴. Although born of the Baroque and still focussing upon many of the same themes (the infinite, divine transcendence, light, reason, exaltation and virtue), the Rococo (the name was thought to derive from the French and Spanish names for sea shells) reacted against the Baroque's emphasis upon absolutely geometrical, rational ordering to embody a far lighter, more whimsical approach in keeping with the Parisian societal demand for charm, wit and elegance⁶⁰⁵.

⁶⁰⁴ Clark, K. (1971). *Civilisation*. p157. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p230.

⁶⁰⁵ Kostof, S. (1995). *A history of architecture: settings and rituals*. p379. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. pp213-214. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. pp21, 58. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p231.

Rather than follow the Baroque preference for creating a spatially inventive, grandiosely scaled and symmetrised rigidity, Rococo buildings tended towards the creation of detail and subtlety⁶⁰⁶. Delicate forms such as shells and plants and precise, fine patterns were used to create intricate ornamentation⁶⁰⁷. The hard edges of geometric wooden panels and gilded mirrors were softened into stucco scrolls, gentle curves and complex, asymmetrical shapes⁶⁰⁸. The brilliant colours and illumination of the Baroque were softened into gentle pastel shades and soft light. The whole combined to create a softer, more delicate manner and intimate atmosphere than that which had characterised the Baroque, and which was very appealing as being well suited to the decoration of rooms and apartments of smaller scales, sparking a turn towards the study of residential décor⁶⁰⁹,

Figure 88: Palace of Versailles, the Salon des Porcelaines decorated in the Rococo style to create a more delicate, softer interior than the brilliant, grandiose spaces favoured by the Baroque.

It was in Southern Germany and Austria however, where the style was particularly popular, that the Rococo reached its greatest splendour in the region's great palaces, monasteries, and churches (French classicism continued to prevail in the north⁶¹⁰). Here the pleasure of sensory delight that epitomises the Rococo is manifested in the architecture of Balthasar Neumann (1687-1753) and Jakob Prantauer. The geometrical forms of their creations dissolve under the mass of decorative embellishment as the desire to convey feeling and sensation replaced the preference for order and understanding⁶¹¹. One of the most extraordinary of these accomplishments is the Bishops Palace of Wurzburg, begun in 1720⁶¹². Neumann was the court appointed architect for the project and while many other architects, artist and sculptors were involved, it was he who was responsible for the exceptional staircase in the Palace. Whilst the residence itself was of the Baroque and Rococo styles and was completed in 1744, the interior was not completed until 1780, by which time the turn to the neo-classical had begun, and in which style the staircase was built.

Figure 89: The grand stair at the Bishops Palace in Wurzburg by Balthasar Neumann

Figure 90: Neuman deliberately lowered the stair riser dimensions so that visitors would be able to ascend the staircase slowly and safely, whilst looking at the frescoes above them

⁶⁰⁶ Goldberger, P. (2009). *Why architecture matters*. p243. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p326.
⁶⁰⁷ Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p222.
⁶⁰⁸ Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p230. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp289-290.
⁶⁰⁹ Mallgrave, H.F (2005) *Modern architectural theory: a historical survey, 1673-1986*. p92. Clark, K. (1971). *Civilisation*. p236. Pelletier, L. (2006). *Architecture in words: theatre, language and the sensuous space of architecture*. pp5-6.

⁶¹⁰ Exner, U. and Pressel, D. (2009). *Spatial Design*.p23. Mallgrave, H.F (2005). *Modern architectural theory: a historical survey, 1673-1986*. p13.
⁶¹¹ Goldberger, P. (2009). *Why architecture matters*. p243. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. pp135, 145.
⁶¹² Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. pp84-85, 91. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p232. Habermann, K. J. (2003). *Staircases: design and construction*. p20. Spens, M. (1995). *Staircases: Detail in Building*. p8. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp14, 17.

Under the vast, self-supporting ceiling and free from spatial and visual constraints, Neumann created a splendid reception area through which guests progressed via the three flights of stairs and an ambulatory in a magnificently controlled processional journey. The grand stair successfully combines the most graceful restraint of neo-classicism with the penchant for the artistry of the Baroque and Rococo; Neumann deliberately designed the risers to two thirds of the usual height so that visitors would be able to ascend the stairs slowly and safely whilst gazing up at the extraordinary frescoes by the Italian artist Giovanni Battista Tiepolo (1696-1770) that covered the vast vaulted ceiling above⁶¹³.

1.4.2 Curious Hybrids

curious

3. adjective

odd⁶¹⁴.

Despite the Rococo diversion in France and Southern Germany and Austria, elsewhere, the fancy for the excessively extravagant décor of the Baroque era really had begun to turn to distaste, and the majority of Europe looked askance on the frivolities of the Rococo⁶¹⁵. In something of an about face, excess was replaced by a kind of moralistic embarrassment more in keeping with enlightenment ideals of rationalism, the classical became of interest again and with it, a more restrained aesthetic⁶¹⁶. With this turn away from the Baroque, and its emphasis upon compartmentalisation and elemental expression, came a return towards consideration of architecture as a holistic practice and correspondingly, a reflection on the interrelationship of building and stair⁶¹⁷. The publication of architectural theorist Nikolaus Goldmann's *Civil-Baunkunst (Complete guide to civil architecture)* by Leonhard Christopher Sturm in 1696 demonstrated the division that had arisen between the two.

⁶¹³ Clark, K. (1971). *Civilisation*. pp226-229.

⁶¹⁴ 'curious' (2011). *Shorter Oxford English dictionary, Sixth Edition*. p584.

⁶¹⁵ Rybczynski, W. (1986). *Home: a short history of an idea*. pp101, 105-106.

⁶¹⁶ Pelletier, L. (2006). *Architecture in words: theatre, language and the sensuous space of architecture*. p21. Templer, J. A. (1992). *The staircase: history and theories*. p160. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. pp84-85, 91, 228, 243. Rybczynski, W. (1986). *Home: a short history of an idea*. pp101-102. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. pp101.

⁶¹⁷ Kostof, S. (1977). *The architect: chapters in the history of the profession*. p157.

Goldman noted that, as a consequence of the intense concentration upon the stair as an isolated element, the self-proclaimed architect as 'stair expert' had eventuated. This specialisation had in turn resulted in an 'incomplete understanding' of the architected building in its entirety. Consequently the stairs had become, in essence, separated from the building, such that while each may work individually, their pairing resulted in problems:

up to now stairways themselves were good, and the building was equally well designed; however they do not belong together and remain until now as the head from a Hercules situated on the rump of an Apollo⁶¹⁸.

In an attempt to curb this turn of events and prevent the creation of further (admittedly disconcerting sounding) hybridist oddities, Sturm went on to demonstrate in great detail via a series of proposed residential plans, how the staircase and building should be architected as an integrated entirety. His explanations combined technical instruction with appreciation of aesthetics and an understanding of spatial relationships to ensure that the stair and house remained in spatial and functional harmony while ensuring safety and beauty. This integration of functional building science with a poetic aesthetic is demonstrated by his writing in a paragraph on 'the beauty of stairs':

*a beautiful staircase requires as much air as possible, it must be transparent and open, so that all is well lit, and the eyes are better able to see*⁶¹⁹.

Figure 91: Staircase of the Balbi Family's Palace at No. 5, Via Balbi, Genoa, Italy, built to house the College of the Jesuits, 1634-1636 (now the Palazzo dell'Università). The ambition of the clients for grandiosity is reflected in the intense focus upon the monumental nature of the principle stair, flanked by a pair of lions who appear somewhat uncomfortable with their precarious perches

⁶¹⁸ Habermann, K. J. (2003). *Staircases: design and construction*. pp18-19

⁶¹⁹ Habermann, K. J. (2003). *Staircases: design and construction*. pp18-19

1.4.3 Constructing Craft and Documenting Details

Sturm's publication was a considerable consolidation of and expansion upon the knowledge surrounding *both* the pragmatics and poetics of stairs and their relationship to the building of which they were a part, and sparked an increased interest as to the beauty of functional form, crafted materiality and the excellence of technique required to achieve this. It became the first of a number of publications concerned with the spatial and technical issues of staircase design and construction techniques and materiality⁶²⁰. This greater focus upon scientific precision and codification and documentation of technique was also fostered by the general climate of the enlightenment, as an era of increasing interest in scientific law, religious scepticism, secularisation of debate, study of the natural landscape and fascination for the sublime⁶²¹. The last had re-kindled interest in the study of human emotions, feelings and ascetics, as a means of gaining insight into the human condition while science, courtesy of Newton, had demonstrated that the universe was subject to natural law⁶²². Amongst this heady mixture of the poetic and pragmatic, the natural and human-made and the rational and unknown, Architecture was treated as another subject to be analysed and de-mystified, and the stair, with its uniquely troublesome relationship to the design and construction of the building as entity, was a prime target for dissection.

Unfortunately, matters did not proceed quite as Sturm had wished. Rather than emphasising the focus upon spatial relationships and unison of the stair and building into the whole as both pragmatic and poetic entity, one of the most influential tomes to emerge - Diderot's and d' Alembert's Encyclopedia (1751), an attempt to collate current scientific and artistic knowledge of the time - focused more upon the materiality of stairs and *then* on their relationship to architecture⁶²³. Stairs were divided as 'architecture' if they were of stone, and 'carpentry' if they were of wood. From this point on, the consideration of the stair and its relationship to the building was increasingly differentiated by and subordinated to material selection and craftsmanship, and thus increasing specificity of form⁶²⁴. Tieleman van der Horst's book, *Treppen-bau-kunst*, (*Stair-building*, 1763) covered the subject of wooden staircase construction, beginning with the straight stair and continuing through to elaborate variations and unusual and intricate details.

It was an illustrated reference book, a pattern book, essentially the first on stair carpentry to be distributed in Europe, that included explanation and instruction as to technique⁶²⁵. This emphasis on specification according to materiality and the definition of the skill set required to specialise in timber stair construction was further reinforced by Johann George Krunitz's (1725-1798) comments in the *Oekonomische encyclopaie* (*Encyclopedia of economics*). In this, published between 1773–1845/58 (there were 224 volumes of which Krunitz who had initiated the project, edited seventy two, hence the lengthy timeframe), Krunitz ventured that the contemporary builder of timber stairs must possess each of the skills previously held by the carpenter and the joiner⁶²⁶. Of the carpenter this meant the ability to think in three dimensions and of the joiner to practice 'precision and craftsmanship'⁶²⁷. Krunitz was also well aware of the need to match the poetic with the pragmatic however, including adamant instructions as to the imperative nature of stair safety demanding that a 'comfortable stair', especially in consideration for 'old and heavily built' persons, must have a platform or landing for rest at regular intervals, preferably every ten or twelve steps, because 'lack of such would overly strain bones and musculature'. Such landings were also very necessary in the event of a slip or mis-step 'that he does not fall the entire length of the stair' for such a fall on a steep stair often has dangerous consequences⁶²⁸.

⁶²⁰ Habermann, K. J. (2003). *Staircases : design and construction*. pp18-20.

⁶²¹ Ross, L. (2009). *Art and architecture of the world's religions*. p25.

⁶²² Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. p533

⁶²³ Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp529-530. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. p159.

⁶²⁴ Habermann, K. J. (2003). *Staircases: design and construction*. p20.

⁶²⁵ Habermann, K. J. (2003). *Staircases: design and construction*. p20.

⁶²⁶ Godfrey, W. H. (1910). *The English staircase: an historical account of its characteristic types to the end of the eighteenth century*. pp3, 6, 12, 14.

⁶²⁷ *Oekonomische Enzyklopädie, oder Allgemeines System der Staats-, Stadt-, Haus-, und Landwirtschaft, in alphabetischer Ordnung*. (Berlin, 1773–1858) It was initiated by the German economist J. G. Krunitz, who edited 72 of the volumes. Habermann, K. J. (2003). *Staircases: design and construction*. p23.

⁶²⁸ Braun, M. (2008). *Stairs: architectural details*. p12.

1.4.4 Scientific Curiosity: An Ergonomic Advance

In this context of this increased focus upon precision, technicality, formalisation of technique and increasing specialisation, the acclaimed French architect and mathematician Jean-Francois Blondel (1705-1774) published his treatise, *Cours de Architecture (Lectures on Architecture)* 1771–1777⁶²⁹. This included the first recorded attempt to devise a precise formulae for the designing of stairs⁶³⁰. As a die-hard classicist, Blondel was critical of the Rococo, referring to the penchant for intricate decoration rather scathingly as the ‘caprices of novelty’⁶³¹. He wished to adhere to the enlightenment quest for the rational through a revival of classical correctness and by doing so would demonstrate the vulgarity, naivety and superficiality of Rococo realism⁶³². Through a return to the idealism of the Renaissance Blondel was convinced that absolutes of architectural rules could be established⁶³³. He was adamant that architectural order was based strictly upon proportions and that this order must therefore never be violated⁶³⁴. The stair would not be permitted to escape this taming either; Blondel subjected it to a series of experiments through which he attempted to create a formula linking stair geometry to human gait, working painstakingly on the problem for some years and recording his scientific curiosity and the results in the Cours⁶³⁵. In a study conducted in about 1672 Blondel demonstrated that risers greater in height than approximately twenty-two cms cannot comfortably be used; nor can a tread of much less than approximately twenty-three cms. Based on his experiments, Blondel’s treatise included his prescription for the dimensions of stairs, based upon the ‘comfortable limits imposed by the human gait’, including his devising of the formula $r2=1t = a \text{ constant}$ ⁶³⁶. Unfortunately, whilst enormously influential as an architect and theoretician, and despite being appointed a lecturer in mathematics at the College Royale in Paris (a post he retained for nearly 20 years), Blondel

was not quite as good a geometer or mathematician as he was a theorist, and the formula he eventually devised was incorrect⁶³⁷. (There is also no ‘one-size-fits-all formula but several according to context, intended use and needs of users’⁶³⁸.) Still, if Blondel’s desire to impose order upon that which until now had been in general been somewhat disordered was slightly more obsessive than accurate it was at least a start; his extensive studies demonstrate that the desire to better understand the ergonomic function of the stair as well as its aesthetic potential, to ensure its users ergonomic comfort and safety, was increasing⁶³⁹.

Meanwhile, Blondel’s attention to the positioning and functionality of the stair as circulatory servant was scarcely less diligent. Even in 1737, when only thirty-two and not yet famed as a theoretician and educator, he published his instructive *Traite de la distribution des maisons de plaisance, et de la decoration des edifices en general (On the layout of country seats and the decoration of edifices in general 1737-38)*⁶⁴⁰. The work was intended for the education of a wealthy clientele rather than for study by architects, so that they might avoid the tasteless (as far as Blondel was concerned) horrors of the Rococo, and comprised a careful analysis of the dwelling in terms of spatial distribution, proportion and circulation⁶⁴¹. It was unusual at the time (in France at any rate) for its focus upon residential architecture rather than that of the monumental or ecclesiastical but interest in the residential had been increased by the Rococo’s whimsy for decoration and its applicability to the smaller scale, therefore it required Blondel’s attention so that order may be imposed⁶⁴². In the *Traite*, Blondel created five scenarios, each pertaining to a different residential client and addressed their varying needs through the provision of site plans, landscaping guides, the spatial organisation of floor plans, sections, façade designs and illustrations as to the décor of the major rooms, all accompanied with thorough explanations as to their rationales⁶⁴³. In accordance with all of this, Blondel concerned himself with vertical circulation as much as with any other aspect of the household, in order to assure smooth and efficient functioning for owners and servants

⁶²⁹ Mallgrave, H.F (2005). *Modern architectural theory: a historical survey, 1673-19*. p22. Cleary, R. (1989). *Romancing the tome; or an academician’s pursuit of a popular audience in 18th-century France*. p141. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp124, 127. Kostof, S. (1995). *A history of architecture: settings and rituals*. p390. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. p53. Pelletier, L. (2006). *Architecture in words: theatre, language and the sensuous space of architecture*. pp13, 17. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p178.

⁶³⁰ Benhamou, R. (1994). *Parallel walls, parallel worlds: the places of masters and servants in the “maisons deplaisance” of Jacques-François Blondel*. p1.

⁶³¹ Mallgrave, H.F (2005). *Modern architectural theory: a historical survey, 1673-19*. p23.

⁶³² Kostof, S. (1995). *A history of architecture: settings and rituals*. p379.

⁶³³ Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p136-137, 139.

⁶³⁴ Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp281-287, 294. Mallgrave, H.F (2005). *Modern architectural theory: a historical survey, 1673-19*. p22. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p139. Pelletier, L. (2006). *Architecture in words: theatre, language and the sensuous space of architecture*. p13.

⁶³⁵ Templer, J. A. (1992). *The staircase: history and theories*. p42. Padovan, R. (1999). *Proportion science philosophy architecture*. pp262, 267.

⁶³⁶ Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p28.

⁶³⁷ Heath, T. (2010) Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. p52. Kostof, S. (1995). *A history of architecture: settings and rituals*. p399.

⁶³⁸ Allen, E. (2005). *How buildings work: the natural order of architecture*. p165.

⁶³⁹ Templer, J. A. (1992). *The staircase: studies of hazards, falls, and safer design*. p27. Habermann, K. J. (2003). *Staircases: design and construction*. p15. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp48-50, 123.

⁶⁴⁰ Benhamou, R. (1994). *Parallel walls, parallel worlds: the places of masters and servants in the “maisons deplaisance” of Jacques-François Blondel*. p1.

⁶⁴¹ Cleary, R. (1989). *Romancing the tome; or an academician’s pursuit of a popular audience in 18th-century France*. p141.

⁶⁴² Pelletier, L. (2006). *Architecture in words: theatre, language and the sensuous space of architecture*. pp5-6.

⁶⁴³ Benhamou, R. (1994). *Parallel walls, parallel worlds: the places of masters and servants in the “maisons deplaisance” of Jacques-François Blondel*. pp1-2. Cleary, R. (1989). *Romancing the tome; or an academician’s pursuit of a popular audience in 18th-century France*. p141. Etlin, R.A. (1996). *Symbolic space: French enlightenment architecture and its legacy*. p127.

alike⁶⁴⁴. He was particularly disparaging of architects who focused only upon the creation of a grandiose ascetic of the exterior while they neglected the practical efficiency and therefore comfort of the interior⁶⁴⁵. For Blondel, practical function *equated* comfort⁶⁴⁶. In this view he was most punctilious about ensuring the positioning of le grand escalier (the grand staircase) in the entry vestibule, as this belonged to the public domain, while the secondary stairs of the servants and those leading to the non-public second floor above the Piano Nobile (first floor), remained hidden, compartmentalised tidily away in accordance with classical ideals on spatial order, harmony and convenience⁶⁴⁷.

While most of Europe had happily followed the French lead and adopted (at least briefly) the Rococo style from which Blondel then became intent upon rescuing them, the English however, took a different course⁶⁴⁸. Although the Rococo did influence such domestic concerns as silverware, china, furniture and fabrics it was generally not to the English liking as an architectural style – it was referred to somewhat disdainfully as the ‘French Taste’ - and was often deemed superficial, in *poor* taste and greeted with uneasiness⁶⁴⁹. This may possibly have been due a more restrained temperament and tradition which, more inclined historically to the gothic than the classical, had looked askance on the unreflective and indulgent lifestyles of the continental European aristocracy⁶⁵⁰. Consequently, the arrangement of the late eighteenth century English home took a different course, uncommon in the rest of continental Europe⁶⁵¹. The English, rather than looking to France, turned instead with relief to Italy and the classicism and serenity of Palladio’s Renaissance designs⁶⁵². This was not just a matter of aesthetics however; Palladio had been an expert on the matter of country villas as both refined residences and working farms, so it did not require a great deal of effort to apply his ideas to the popular institution of the times, the English Country House⁶⁵³. Initially, Palladian lessons were applied attentively to matters of planning, but after 1700, English tastes and

Italian examples blended to become a uniquely popular and influential style and a standard by which matters of taste were increasingly judged throughout the eighteenth century⁶⁵⁴. Perhaps somewhat surprisingly then, the English, despite generally preferring Italian ideals to French frivolity, did diverge from essentially Palladian classicism in one respect – namely that of the interior stair. Rather than following Palladio’s precedent and encasing the stair out of sight, if it was indeed ‘the truth, universally acknowledged, that a single man in possession of a large fortune, must be in want of a wife’, Jane Austen, writing at the end of the eighteenth century could equally well have observed that a single man in possession of a large fortune, must also have been seriously in want of a staircase⁶⁵⁵. By the time *Pride and Prejudice* was published in 1813, the cachet of a suitably grandiose principle stair in a country seat was a fact so ‘well fixed’ in the minds of the English Georgian and Regency gentry that (as in the Baroque era), one could effectively judge the measure of a man on the size of his staircase⁶⁵⁶.

⁶⁴⁴ Benhamou, R. (1994). *Parallel walls, parallel worlds: the places of masters and servants in the “maisons deplaisance” of Jacques-François Blondel*. pp2-3, 6, 8-9.

⁶⁴⁵ Etlin, R.A. (1996). *Symbolic space: French enlightenment architecture and its legacy*. p130.

⁶⁴⁶ Mallgrave, H.F (2005). *Modern architectural theory: a historical survey, 1673-19*. p40. Etlin, R.A. (1996). *Symbolic space: French enlightenment architecture and its legacy*. p130.

⁶⁴⁷ Kostof, S. (1977). *The architect: chapters in the history of the profession*. p157. Etlin, R.A. (1996). *Symbolic space: French enlightenment architecture and its legacy*. pp131-132. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p9.

⁶⁴⁸ Rybczynski, W. (1986). Home: a short history of an idea. p113.

⁶⁴⁹ Heckscher, H. M. (1969) *Gideon Saint: An Eighteenth-Century Carver and His Scrapbook*. pp299, 304-305. Clark, K. (1971). *Civilisation*. p236.

⁶⁵⁰ Kostof, S. (1995). *A history of architecture: settings and rituals*. p549. Rybczynski, W. (1986). Home: a short history of an idea. pp113-114.

⁶⁵¹ Rybczynski, W. (1986). Home: a short history of an idea. p113.

⁶⁵² Logan, T. (2001). *The Victorian parlour*. pp14-15. Rybczynski, W. (1986). Home: a short history of an idea. pp114, 117.

⁶⁵³ Rybczynski, W. (1986). Home: a short history of an idea. pp104-106. Ross, J. (2002). *Jane Austen: a companion*. p175.

⁶⁵⁴ Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. pp348-359, 367. Logan, T. (2001). *The Victorian parlour*. p16. Rice, C. (2007). *Emergence of the interior: architecture, domesticity, modernity*. pp2, 58, 67, 71, 73. Rybczynski, W. (1986). Home: a short history of an idea. pp105-106, 114, 118-119, 125.

⁶⁵⁵ Austen, J. and Tanner, T. [Intro.]. (2002). *Pride and prejudice*. ppxi, 5. Ross, J. (2002). *Jane Austen: a companion*. pp13, 19-20, 34. Logan, T. (2001). *The Victorian parlour*. pp15-16. Rybczynski, W. (1986). Home: a short history of an idea. pp108.

⁶⁵⁶ Mitchell, S. (2009). *Daily life in Victorian England. Second edition*. p112. Logan, T. (2001). *The Victorian parlour*. p16. Gwilt, J. (1842). *An encyclopaedia of architecture: historical, theoretical, and practical*. p207. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp9-10.

1.4.5 Anomalies, Anachronisms, Anarchy and Asymmetry: Viollet-Le-Duc

Size of course, is not everything, but in this respect, the English were not the only ones who were convinced that it was. Even when, towards the end of the eighteenth century, the Baroque and Rococo had finally been widely abandoned throughout Europe in favour of a more classically refined style, the interest in the principle interior stair as means of effecting a grand entrance remained, as did both the considerable quantity of space that continued to be dedicated to its execution and the delight in symmetry that characterised its presence⁶⁵⁷. The French theoretician Eugene-Emmanuel Viollet-Le-Duc (1814-1879) writing in his *Entretiens sur l'architecture* of 1858–72 (*Discourses on architecture*, translated into English in 1875) was thoroughly vexed by both ideals⁶⁵⁸. Viollet-Le-Duc lamented the requirement for symmetry (on the grounds of harmony) that had led to the formulation of these 'double stairs' and their excessive consumption of space:

under consideration of the fact that today spiral staircases are seen as a leftover curiosity of the Middle Ages I note that they are very useful when one wants to reach the next floor while consuming a limited amount of space. Is that not reason enough to label these double stairs, which consume much too much space, a larger curiosity? They remind me, with their exaggerated monumentality, of the words of a poet, who uses grandiose words to promise things he never fulfils⁶⁵⁹.

and further

symmetry ... an unhappy idea for which we sacrifice our comfort, occasionally our common sense and always a lot of money⁶⁶⁰.

Admittedly Viollet-Le-Duc may have been a somewhat maverick figure at this time, a neo-gothic, structural-rationalistically inclined Jeremiah amongst a neo-classical fervour that was far from enamoured with the diagonal dynamics of the great cathedrals as their ecclesiastical patrons of the twelfth century had been⁶⁶¹. His controversial lecture series of 1864 on Romanesque and Gothic buildings at the classically dominated Ecole des Beaux-Arts

sparked such uproar amongst the attendees it was followed first by rioting in the streets of Paris and secondly his resignation⁶⁶². But Viollet-Le-Duc's recorded vexation at the disparity between fulfilling need appropriately and promoting excess extravagantly, demonstrates that for all the apparent attention (and serious quantities of space) given to the stair as an architecture of supposed importance, the intent behind it all remained essentially superficial and aesthetically driven⁶⁶³. Considered thought as to how the stair and the house might best coexist and serve one another and the occupants through the achievement of a harmonious combination of pragmatics and poetics - aesthetically, spatially and experientially - still remained non-existent. The excessive ornamentation of the Baroque and Rococo eras may finally have wilted away but the grand stair-as-object still remained, an anachronism and oddity, an uncomfortable combination of all-too obvious presence but uncertain purpose; significant only in terms of the attention that its disproportionate consumption of space, centrality of placement in the house and fashioning achieved, and the status consequently afforded its owner as a result.

1.4.6 Material Concerns

If Viollet-Le-Duc was considered somewhat radical with regard to his preferences for the gothic and asymmetry, (at least as far as the Ecole des Beaux Arts was concerned) this mavericity also extended to his fascination for the newly emerging materials of the era and their architectural potential⁶⁶⁴. Iron had been smelted in small quantities in Asia Minor since 2000 BCE but it was not until the industrial revolution gained pace that casting techniques had improved sufficiently to enable cast iron to be produced in great quantity, and, with the development of the railways in the 1830s, to be easily transported⁶⁶⁵. Viollet-Le-Duc was not interested in the theology of the gothic at all - he had no compunction about severing the skeletal structure of the architecture and its corresponding forms in which he was interested from the religious thought that had eventuated them - but he was attracted to the ideal of

⁶⁵⁷ Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p92

⁶⁵⁸ Viollet-le-Duc, E. and Hearn, M. F. [Ed.] (1990). *The architectural theory of Viollet-le-Duc: readings and commentary*. p17.

⁶⁵⁹ Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. pp202-203, 259. Habermann, K. J. (2003). *Staircases: design and construction*. pp18-19.

⁶⁶⁰ Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. p144. Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. pp208, 251, 267-268, 274, 288, 373.

⁶⁶¹ Kostof, S. (1977). *The architect: chapters in the history of the profession*. p178. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p412. Kostof, S. (1995). *A history of architecture: settings and rituals*. pp592, p641. Goldberger, P. (2009). *Why architecture matters*. p238. Harbison, R. (2009). *Travels in the history of architecture*. p206.

⁶⁶² Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p412. Till, J. (2009). *Architecture depends*. p14.

⁶⁶³ Drexler, A. and Chafee, R. (1977). *The architecture of the Ecole des Beaux-arts*. pp102-103.

⁶⁶⁴ Goldberger, P. (2009). *Why architecture matters*. p328. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p394. Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. p13.

⁶⁶⁵ Farrelly, L. (2007). *The fundamentals of architecture*. p130. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p35. Sussman, H. (2009). *Victorian technology*. p3, 24. Leslie, T. (2010). *Built like bridges: iron, steel, and rivets in the nineteenth-century skyscraper*. p236. Robertson, E. G. and Robertson, J. (1977). *Cast iron decoration: a world survey*. p11. Wigginton, M. (1996). *Glass in architecture*. p38. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p395. Kostof, S. (1995). *A history of architecture: settings and rituals*. p641. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p114.

structural rationalism, the defining of architectural form by structural function⁶⁶⁶. It was thought at the time that in creating the great gothic cathedrals the medieval masons had been striving for a unity of structural function and aesthetic form and Viollet-le-Duc lauded the soaring spans of the gothic structural system, the ribbed vault, the ogive and the flying buttress that had apparently eventuated as a result⁶⁶⁷. (It has since been demonstrated that the masons made some decisions based as much on a metaphysical appreciation of geometry as any structural suppositions they were able to deduce, but Viollet-Le-Duc could not know this⁶⁶⁸.) He was fascinated by and attracted to the daring new combination of metal and masonry and the novel flexibility of the experimental forms this union of structural behaviours made possible⁶⁶⁹. Viollet-Le-Duc regarded the era's iron framing as the equivalent contemporary means by which the marvellous spatial forms and intricate details of the medieval cathedrals could be replicated⁶⁷⁰.

The Ecole Des Beaux Artes at which Viollet-le-Duc had attempted to lecture on these matters disapproved of the new building materials however, due to issues of aesthetics, and was studiously concerning itself with ignoring them⁶⁷¹. This meant also ignoring the equally new techniques involved in their production and knowledge concerning their structural design, all of which were advancing rapidly regardless of architectural approval (or its absence)⁶⁷². This last had led to the generation of tabulated calculations, from which copious information as to tensile and bending strengths etc. could easily be attained. Unfortunately, architects were not particularly inclined to do so. Much as stairs had been a somewhat disturbing problem

to Alberti in the sixteenth century, the emergence of mass produced cast iron was a similarly disturbing problem to the majority of English and French architects in the mid nineteenth century, as a result of which these new developments were generally greeted by them with far more suspicion than acclaim⁶⁷³. With the exception of those who were maverickly inclined, such as Viollet-Le-Duc and François Belanger (1744-1818) who won a competition in 1805 to design a roof for the Halle au Ble corn exchange in Paris and created a cast iron dome, most were not wildly enthused as to the new developments on the material front and did not exactly trample one another in the rush to be first to embrace them⁶⁷⁴. In fairness, it must be remembered that cast iron was not without drawbacks - it was brittle, prone to rust, had very low tensile strength and (as it became evident) a disappointingly low melting point and while wrought iron overcame these issues it was much more expensive to produce.⁶⁷⁵ But in truth, Neo-classicism was well entrenched in the collective English and French architectural psyches of this time. Until now, materials had been restricted to what was locally and therefore readily available, as a result of which load bearing masonry construction buildings had become the tradition; thus the real objections to cast iron lay in the (to architects at least) clear evidence of its architectural inferiority - its manufactured nature and inapplicability to the serene ideals and traditions of divine order⁶⁷⁶. Even though it could carry the weight of neo-classical tradition structurally, it should not be allowed to architecturally. In his treatise *The seven lamps of architecture* (1849) English architect John Ruskin (1819-1900) stated his opposition to cast or machine made product claiming

'there are two reasons both weight, against this practice, one, that all cast and machine work is bad, as work, the other that is dishonest'⁶⁷⁷.

⁶⁶⁶ Kostof, S. (1995). *A history of architecture: settings and rituals*. pp586, 571, 592. Rybczynski, W. (2001). *The look of architecture*. p55. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p130. Gelenter, M. (1995) *Sources of architectural form: a critical history of Western design theory*. p75. Brolin, B. C. (1985). *Flight of fancy: the banishment and return of ornament*. pp137-138. Turnball, D. (2000). *Masons, tricksters and cartographers: comparative studies in the sociology of scientific and indigenous knowledge*. pp74, 77.

⁶⁶⁷ Viollet-le-Duc, E. and Hearn, M. F. (Ed.) (1990). *The architectural theory of Viollet-le-Duc: readings and commentary*. pp200-201. Kostof, S. (1995). *A history of architecture: settings and rituals*. p592. Wigginton, M. (1996). *Glass in architecture*. p15. Armstrong, I. (2008). *Victorian glassworlds: glass culture and the imagination 1830-1880*. p153. Gelenter, M. (1995) *Sources of architectural form: a critical history of Western design theory*. p75. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. px. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p157.

⁶⁶⁸ Gelenter, M. (1995) *Sources of architectural form: a critical history of Western design theory*. p75. Wigginton, M. (1996). *Glass in architecture*. p15. Turnball, D. (2000). *Masons, tricksters and cartographers: comparative studies in the sociology of scientific and indigenous knowledge*. p59.

⁶⁶⁹ Kostof, S. (1995). *A history of architecture: settings and rituals*. pp643, 571. Viollet-le-Duc, E. and Hearn, M. F. (Ed.) (1990). *The architectural theory of Viollet-le-Duc: readings and commentary*. pp231, 232-233. Wigginton, M. (1996). *Glass in architecture*. p15. Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. pp29-30, 41-42, 44-45, 54, 56, 58-59, 62-63, 71-72.

⁶⁷⁰ Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. px. Kostof, S. (1995). *A history of architecture: settings and rituals*. p571. Turnball, D. (2000). *Masons, tricksters and cartographers: comparative studies in the sociology of scientific and indigenous knowledge*. p59. Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. pp44, 59, 74, 89, 115.

⁶⁷¹ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p130.

⁶⁷² Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p395.

⁶⁷³ Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p419.

⁶⁷⁴ Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. p72. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p130. Kostof, S. (1995). *A history of architecture: settings and rituals*. p596. Viollet-le-Duc, E. and Hearn, M. F. (Ed.) (1990). *The architectural theory of Viollet-le-Duc: readings and commentary*. p232-233. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp129-130. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p419.

⁶⁷⁵ Leslie, T. (2010). *Built like bridges: iron, steel, and rivets in the nineteenth-century skyscraper*. p235-226, 246. Robertson, E. G. and Robertson, J. (1977). *Cast iron decoration: a world survey*. p12. Kostof, S. (1995). *A history of architecture: settings and rituals*. p577.

⁶⁷⁶ Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p419. Harbison, R. (2009). *Travels in the history of architecture*. pp207, 217-218.

⁶⁷⁷ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp131, 153. Brolin, B. C. (1985). *Flight of fancy: the banishment and return of ornament*. pp87-88, 95-96. Robertson, E. G. and Robertson, J. (1977). *Cast iron decoration: a world survey*. pp12, 18. Logan, T. (2001). *The Victorian parlour*. pp18-19.

This equation of mass produced cast iron as more akin to the work of the devil than the work of man was fairly widespread amongst the architecturally inclined (and craftsmen in general)⁶⁷⁸. Consequently, although cast and wrought iron (and later steel) were quickly transferred into construction applications, it was not by architects, but instead by an emerging phalanx of civil and mechanical engineers fresh from the growth of specialised school and training, to create very pragmatically functional buildings such as mills, warehouses, railway stations and greenhouses⁶⁷⁹. (The last might sound a touch incongruous but it was a reflection of the Victorian taste for the more exotic flora of its colonial empire which required a considerably balmy environment than England could supply naturally if it was to survive transplantation there). It was not until 1851 and an undeniable event occurred that the attitudes of architects towards the new availability and types of iron *and* glass were forced to confront what would be a slow and painful - but inexorable - shift in direction⁶⁸⁰. Ironically, the building largely responsible for achieving this – The Crystal Palace - was designed by a landscape gardener, Joseph Paxton (1803-1865), who put his knowledge of greenhouse construction to great use, thus fully proving the rather delightful observation of architectural historian Professor Franklin Toker that “‘architects’ in England were a much looser professional group’ (than those of France) and who, ‘even as late as the nineteenth century, tended to be generalists who had wandered in from some other career’, which if it seems slightly alarming from a contemporary perspective was pleasingly (to the Victorian public) in keeping with the spirit of ingenious invention and novelty of the times⁶⁸¹.

The Crystal Palace was designed to house a trade exhibition in 1851, the first *International Exposition*, (its official title was The Great Exhibition of the Works of Industry of all Nations London)⁶⁸². Born of the desire of Prince Albert (President of the Society for the Encouragement of Arts, Commerce and Science) of Royal Arts) to unite man, celebrate the Victorian empire’s prowess in mass production, inspire awe (and show-off), it was comprised of standardised, prefabricated cast iron components bolted together and infilled with glass panels; and was one of the world’s first ‘modern’ buildings.⁶⁸³ Despite its immense proportions (including the requirement that it be tall enough to accommodate a group of monumental elm trees in Hyde Park where it was to be situated) it took just twenty-two weeks to erect and was fitted out and painted in sixteen more⁶⁸⁴. The curiosity this feat aroused was immense; huge crowds flocked to marvel as much at the design of the building as the contents that it housed - in awe they referred to it as ‘miraculous’ - and Paxton and his team (Charles Fox and Henderson, engineers), Thomas Cubitt (builder) Owen Jones, (interior architect), Henry Cole (project administrator) and Matthew Wyatt (architectural critic and the project’s recorder) received great royal and public acclaim for creating a marvellous architecture of and for the machine age – an unprecedentedly brilliant choreography of standardisation, procurement, materials, mass production, work force, construction, technology and all round triumph⁶⁸⁵.

⁶⁷⁸ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp131-132. Kruft, H.-W. (1994). *A history of architectural theory: from Vitruvius to the present*. p332. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p339.

⁶⁷⁹ Farrelly, L. (2007). *The fundamentals of architecture*. p130. Mitchell, S. (2009). *Daily life in Victorian England. Second edition*. pp6, 58. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p128, 395. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. pp395, 419. Mitchell, S. (2009). *Daily life in Victorian England. Second edition*. p79. Sussman, H. (2009). *Victorian technology*. p27, 59. Wigginton, M. (1996). *Glass in architecture*. pp30-34, 46, 190. Bradley, S. (2007). *St Pancras Station*. p58. Armstrong, I. (2008). *Victorian glassworlds: glass culture and the imagination 1830-1880*. pp146-183, 185. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p15. Harbison, R. (2009). *Travels in the history of architecture*. pp217-218. de Botton, A. (2006). *The architecture of happiness*. pp46-47. Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. pp70-71.

⁶⁸⁰ Farrelly, L. (2007). *The fundamentals of architecture*. p130.

⁶⁸¹ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p132. McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. p13. Bird, A. (1976). *Paxton's palace*. pp30-31. Wigginton, M. (1996). *Glass in architecture*. p37. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p158. Toker, F. (1985). *Gothic architecture by remote control: an illustrated building contract of 1340*. p557. Armstrong, I. (2008). *Victorian glassworlds: glass culture and the imagination 1830-1880*. p170. Sussman, H. (2009). *Victorian technology*. p56. Kostof, S. (1977). *The architect: chapters in the history of the profession*. pp191-194, 197. Harbison, R. (2009). *Travels in the history of architecture*. pp218-219.

⁶⁸² Farrelly, L. (2007). *The fundamentals of architecture*. p130. Sussman, H. (2009). *Victorian technology*. p55. Matte, E. (1998). *World's fairs*. pp8, 11-12. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp114. Farrelly, L. (2007). *The fundamentals of architecture*. p130. McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. p21. Wigginton, M. (1996). *Glass in architecture*. p42. Farrelly, L. (2007). *The fundamentals of architecture*. p130. Mitchell, S. (2009). *Daily life in Victorian England. Second edition*. p7.

⁶⁸³ McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. p5, 8-9, 42. Piggott, J. R. (2004). *Palace of the people: the crystal palace at Sydenham 1854 – 1936*. p2. Matte, E. (1998). *World's fairs*. p12. Farrelly, L. (2007). *The fundamentals of architecture*. p130. McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. p4, 5, 21, 23. Wigginton, M. (1996). *Glass in architecture*. p38, 42. Matte, E. (1998). *World's fairs*. p12. Armstrong, I. (2008). *Victorian glassworlds: glass culture and the imagination 1830-1880*. p190. Sussman, H. (2009). *Victorian technology*. p55.

⁶⁸⁴ Bird, A. (1976). *Paxton's palace*. pxi. McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. p19. Wigginton, M. (1996). *Glass in architecture*. p42. Sussman, H. (2009). *Victorian technology*. pp57-58.

⁶⁸⁵ Sussman, H. (2009). *Victorian technology*. pp56, 58-59. Bird, A. (1976). *Paxton's palace*. pp71, 115-116. Piggott, J. R. (2004). *Palace of the people: the crystal palace at Sydenham 1854 – 1936*. p11. Matte, E. (1998). *World's fairs*. p13. McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. pp5, 14, 21. Wigginton, M. (1996). *Glass in architecture*. p46. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p420. Bird, A. (1976). *Paxton's palace*. pxi. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p127. Kostof, S. (1977). *The architect: chapters in the history of the profession*. pp200, 202.

The marvellous spectacle of the exhibition was recorded by the Italian writer Edmondo de Amicis in his *Jottings about London* (trans. 1883) and the presence of the staircases, aside from being a practical means of creating vertical space and avoiding the need for an even greater building footprint, clearly contributed to the experience of the exhibition also

you go up a staircase; galleries stretch endlessly away before you, where you can walk miles among oil paintings, water colours, photographs, and busts of celebrated men. And above these, more galleries with a thousand turns, from which on looking out you take in at a glance the beautiful landscape of the county of Kent, and looking below, all that fantastic circuit of halls, gardens, courts, theatres, and restaurants; people going up and down, and thronging about the theatres, and appearing and disappearing among the plants and statues; and on this prodigious variety of forms, colours, and sights, of this compendium of the world, arched over by a crystal firmament, the sunlight darts in and spreads a glow over everything, throwing prismatic colours and rays and showers of silver sparks along the walls and azure arches⁶⁸⁶.

This opportunity to experience the exhibition from above - to view it from a position of some remove as well as from directly within the jostle, chaos and noise of the crowds, events and exhibits, clearly contributed to an ability to appreciate the fair not just as direct experience but as event also, event-as-*spectacle*, as *show*, as in excellently Victorian fashion in fact, (in an era fascinated by learning the manner in which things were made) – a *production*⁶⁸⁷. de Amicis words suggest the sense that the fair was in fact so momentous that participation was actually *insufficient* to apprehend its full significance, and that for this, one must appreciate it from a position without, that it must in fact be *witnessed*, experienced through observation also, if it was to be truly, completely apprehended; as the locus of related but individual events, occurring within a collective whole, situated in a specific place, occurring at a unique time, as the endeavour of a unique nation⁶⁸⁸.

The advantage of elevated observation was no doubt reinforced at times by the fact the exhibition had compressed an innumerable-seeming array of disparate, related, unrelated or even opposing, bizarrely juxtaposed and scaled objects, events and experiences into a collective locus with a bravado and gusto that could seem both incredible and bewildering if de Amicis words are to be believed

from the sphinxes of an Egyptian court-yard you see in the distance a Greek house with the group of the Laocoön and the Venus of Milo. From a Greek house you enter a Roman house; here your gaze penetrates into the mysterious little chambers of the Alhambra; and from the Alhambra you look into the court of a little Pompeian house. You go out and pass between groups of lions and tigers, fighting and biting, between two rows of eagles and parrots, and next come out in a Byzantine court, from which, through a series of doors, you see the court of a medieval house, the hall of a Renaissance palace, or the chapel of a Gothic church⁶⁸⁹.

This relentless compression of humanity's collective history and endeavours into the bizarrely massless, indefinable interior of the Palace - divided somehow into order to become succession after succession of nationalistically-situated interludes and episodes of human affairs - was staggering⁶⁹⁰. For visitors adrift in a sea of marvels and other visitors, the stairs - providing a more familiar, recognisable and static anchor amidst a temporal tide - would frequently become the means by which one could ascend above the crowd, orient oneself within it and weave an orderly processional circuit amidst and through a chaos of colour, noise and visual confusion⁶⁹¹. It was rumoured of the construction of a London theatre of the time, that the building was well under way by the time it was realised that the architect had neglected to include a stair in their scheme so cash customers could access the gallery⁶⁹². No such errors had been made with the Crystal Palace and the building was well provided for with twelve pairs of elegantly proportioned and detailed stairs of cast iron and elm, the components of which like the rest of the building, had been efficiently mass produced and assembled on site⁶⁹³.

⁶⁸⁶ <http://www.victorianlondon.org/buildings/crystalpalace.htm> Sussman, H. (2009). *Victorian technology*. p57.

⁶⁸⁷ Piggott, J. R. (2004). *Palace of the people: the crystal palace at Sydenham 1854 – 1936*. p31. McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. p28. Sussman, H. (2009). *Victorian technology*. pp54, 60, 65.

⁶⁸⁸ Matte, E. (1998). *World's fairs*. p13. McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. pp17, 28. Farrelly, L. (2007). *The fundamentals of architecture*. p130. McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. p4, 5, 21, 23. Wigginton, M. (1996). *Glass in architecture*. p38, 42. Kostof, S. (1977). *The architect: chapters in the history of the profession*. pp200, 202. Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p420. Sussman, H. (2009). *Victorian technology*. pp54-55, 58-59.

⁶⁸⁹ Mitchell, S. (2009). *Daily life in Victorian England. Second edition*. p8. McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. p29. Piggott, J. R. (2004). *Palace of the people: the crystal palace at Sydenham 1854 – 1936*. pp21, 117 <http://www.victorianlondon.org/buildings/crystalpalace.htm>.

⁶⁹⁰ Piggott, J. R. (2004). *Palace of the people: the crystal palace at Sydenham 1854 – 1936*. pp11. McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. pp28-29. 13, 117. Sussman, H. (2009). *Victorian technology*. p55, 73.

⁶⁹¹ McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. p28.

⁶⁹² Bird, A. (1976). *Paxton's palace*. p89.

⁶⁹³ McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. pp10, 28. Bird, A. (1976). *Paxton's palace*. p93. Matte, E. (1998). *World's fairs*. p13.

Figure 92: The crystal palace at Hyde Park, 1851

Figure 93: The crystal palace interior, with crowds enjoying the views from the galleries

Figure 94: The crystal palace interior, including stair, awaiting dismantling after the exhibition

Figure 95: Crystal palace, stair detail

The stairs however, were the last thing on many people minds when there were far greater issues at stake. Not everyone was impressed by the exhibition or the manner of its housing and de Amicis' description of 'the lions and tigers fighting and biting' could have equally applied to the snide wrangling then taking place between engineers and architects. In a backhanded compliment the ecclesiologist (the monthly journal of the English architectural group the Ecclesiological society, founded in 1845, with the aim of promoting gothic architectural ideals) sniffily declared that The Crystal Place was

not architecture: it is engineering – of the highest merit and excellence but not architecture. Form is wholly wanting, and the idea of stability or solidity is wanting⁶⁹⁴

thereby unhelpfully contributing to the development of an incollegial and deep-seated rivalry of mutual suspicion, superiority and disdain between subsequent generations of architects and engineers that continues to plague interactions between the two professions today⁶⁹⁵.

This use of structural cast iron in this highly visible manner to create a public building so crucial – one that flaunted its strength, structure and form but did so without the tradition of *mass* - was assuredly not to many architects liking⁶⁹⁶. Rather like the attitude of Alberti towards stairs and his wish to have as few as possible and that they preferably be invisible, prevailing architectural opinion held that iron functioned perfectly well hidden, which was precisely where it should stay⁶⁹⁷. And if it absolutely must be visible it should be amenable to and made presentable by appropriately decorative ornamentation produced by hand and with artistry⁶⁹⁸.

- ⁶⁹⁴ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p152. Chadwick, G. F. (1961). *The works of Sir Joseph Paxton, 1803-1865*. (online). Armstrong, I. (2008). *Victorian glassworlds: glass culture and the imagination 1830-1880*. p153. McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. pp40-41. Armstrong, I. (2008). *Victorian glassworlds: glass culture and the imagination 1830-1880*. p117, 134. Kostof, S. (1995). *A history of architecture: settings and rituals*. p589.
- ⁶⁹⁵ Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. pp17, 315, 419. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p128. Cook, P. (1967). *Architecture: action and plan*. pp22-23. Fisher, T. R. (2000). In the scheme of things: alternative thinking on the practice of architecture. pp27-28. Harbison, R. (2009). *Travels in the history of architecture*. p217. See Saint, A. (2007). *Architect and Engineer: A study in sibling rivalry for a detailed history*.
- ⁶⁹⁶ Armstrong, I. (2008). *Victorian glassworlds: glass culture and the imagination 1830-1880*. p9. Sussman, H. (2009). *Victorian technology*. pp56, 74. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p202. Botton, de. A. (2006) *The architecture of happiness*. pp46-47.
- ⁶⁹⁷ Kostof, S. (1995). *A history of architecture: settings and rituals*. p595. Viollet-le-Duc, E. and Hearn, M. F. (Ed.) (1990). *The architectural theory of Viollet-le-Duc: readings and commentary*.p232-233. Bradley, S. (2007). *St Pancras Station*. p111. Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. pp65-66, 70-71, 116-117, 290.
- ⁶⁹⁸ Sussman, H. (2009). *Victorian technology*.pp4, 33. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p152. Robertson, E. G. and Robertson, J. (1977).

This was about the only architectural context in which it *had* been regularly seen until the development of efficient mass production techniques in the nineteenth century the small production quantities limiting its use in construction to such things as small ornamental works and decorative hardware⁶⁹⁹.

In this context, cast iron was eventually grudgingly approved of by architects but the extent of the distaste in which it was generally held had been too long standing to be relinquished without a fight, as is demonstrated by the behaviour of Christopher Wren (1632-1723) towards the earliest known use of architectural cast ironwork in England – the railing surrounding St. Paul’s Cathedral in 1714⁷⁰⁰. Wren had been determined to have a wrought iron fence as opposed to cast iron railings; so determined in fact that his intractability on the matter eventuated in a quarrel which contributed to his dismissal⁷⁰¹. The architect Isaac Ware (ca.1704-1766) *was* however in favour of thoughtful use of cast iron and the first to publicise this view, in his treatise *A complete body of architecture* (1756-57), noting

Cast iron is very serviceable to the builder and a vast expense is saved in many cases by using it; in rails and balusters it makes a rich and massy appearance when it has cost very little and when wrought iron, much less substantial, would cost a vast sum⁷⁰².

Figure 96: Ironwork balusters by William Kinman, to a design by Robert Adam, 1774

Figure 97: Sir John Soane Museum, London, iron balustrade on the staircase to the upper drawing office. 1808-09

Sir John Soane’s treatment of the stair balustrades was highly unusual given the more ornate preferences of the early nineteenth century

But despite both the victory of its use to surround St Paul’s Cathedral and Ware’s generous approbation, the die, so to speak had been cast and the conflict between the two materials was set and continued for many years, culminating in the widespread architectural distaste for Paxton’s ‘engineered’ Crystal Palace. M.M Ecke’s treatise *Traite de l’application general du fe, (On the use of cast iron)*, published in 1841, in which specific sections were allocated to the construction of stairs by material – stone, wood and iron – thereby demonstrating a new theoretical basis for their construction – had been very much a minority voice⁷⁰³. It was not until the nineteenth century wore on (and irrespective of architectural opinion) that a general taste for cast ironware developed by which time mass production was able to deliver it affordably⁷⁰⁴. As a result, cast iron decorative elements could be incorporated into stair designs or be used to produce the entirety of the stairs themselves reasonably economically, and after such designs found favour with the wealthy, they became widely popular⁷⁰⁵. But it was a shift in taste of which many architects remained highly disapproving⁷⁰⁶. Ruskin, outraged by the collective public dismissal of the architect, craftsman and ornament in favour of the engineer, manufacturer and machine made had referred to The Crystal Palace and its massless might as a ‘greenhouse’, while the staunch advocate for English Gothic-revival, architect and theoretician Augustus Welby Pugin (1812-1852) had disdained it as the ‘glass horror’ and ‘crystal humbug’⁷⁰⁷. The general ill-feeling that Paxton’s remarkable achievements inspired in the architectural establishment of the time was so intense that even his obituary was not free from it. The journal *The Builder* (founded by architect Joseph Aloysius Hansom in 1843) was apparently so unable to resist a last chance to deride the man who had (apparently) trampled carelessly upon centuries of architectural tradition that they were even willing to align themselves with *engineers* for a last spiteful swipe:

⁶⁹⁹ Cast iron decoration: a world survey. pp12-13. Logan, T. (2001). *The Victorian parlour*. pp19-20. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p142.
⁷⁰⁰ Fazio, M., Moffett, M. and Wodehouse, L. (2008). *A world history of architecture*. p196. Brolin, B. C. (1985). *Flight of fancy: the banishment and return of ornament*. p87.
⁷⁰¹ Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p35. Robertson, E. G. and Robertson, J. (1977). *Cast iron decoration: a world survey*. p16.
⁷⁰² Robertson, E. G. and Robertson, J. (1977). *Cast iron decoration: a world survey*. p16.
⁷⁰³ Robertson, E. G. and Robertson, J. (1977). *Cast iron decoration: a world survey*. p18.

⁷⁰³ Habermann, K. J. (2003). *Staircases: design and construction*. p23. Viollet-le-Duc, E. and Bucknall, B. [Trans.]. (1875). *Discourses on architecture*. pp70-71.
⁷⁰⁴ Habermann, K. J. (2003). *Staircases: design and construction*. p23. Robertson, E. G. and Robertson, J. (1977). *Cast iron decoration: a world survey*. pp18, 25, 27. Logan, T. (2001). *The Victorian parlour*. p18. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p132.
⁷⁰⁵ Robertson, E. G. and Robertson, J. (1977). *Cast iron decoration: a world survey*. pp18-20. Habermann, K. J. (2003). *Staircases: design and construction*. p23. Logan, T. (2001). *The Victorian parlour*. p11. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p114. Sennott, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. pp135-136.
⁷⁰⁶ Kostof, S. (1977). *The architect: chapters in the history of the profession*. p202. de Botton, A. (2006) *The architecture of happiness*. pp46-47.
⁷⁰⁷ Eli Adams, J. (2009). *A history of Victorian literature*. pp154-155. Armstrong, I. (2008). *Victorian glassworlds: glass culture and the imagination 1830-1880*. p9. Sussman, H. (2009). *Victorian technology*. p56. Wigginton, M. (1996). *Glass in architecture*. p45. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp150-151. Kruft, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. p329.

it is extremely unsafe to prefer the man who has not had, to the man who has had, the education and training for a profession. His attainments fall short of those of an architect or engineer. He could not have accomplished the building of 1851 without architects and engineers, who ably co-operated, or rather, who took the entire work into their hands⁷⁰⁸

Ruskin's abhorrence for the machine age was certainly never to mellow with age and extended to all buildings that bore its imprint. The first sentence of his *Seven Lamps of Architecture*, published in 1857 had read - Architecture is the art which so disposes and adorns the edifices raised by man ... that the sight of them may contribute to his mental health, power and pleasure – to which in 1880 he then added a footnote; 'This separates architecture from a wasp's nest, a rat hole and a railway station'⁷⁰⁹. Ironically, it was in a hotel built to service a railway station that one of the most startling staircases of the era was constructed, an extraordinary configuration of stone, concrete, cast and wrought iron. The Grand Staircase in the St. Pancras Midland Grand Hotel (1873 – now renovated and restored as the St. Pancras Renaissance London Hotel) designed by George Gilbert Scott (1811-1878) is as remarkable for its dramatic revelation of structural honesty as its spatial sinuosity⁷¹⁰. Scott bucked the ideas of the time, espoused by Ruskin and Pugin that demanded the concealment of cast iron to display all the structural girders that support the stair such that they cross the space, visibly support the stone treads and landings, even displaying the bracing brackets that extend out from the walls to support them⁷¹¹. The use of cast iron in this way was a remarkably defiant act, especially given the stair's situation in a grand hotel⁷¹². The use of wrought iron to effect the bannisters is more conventional, but its presence only serves to highlight the unashamedly visible, functional presence and defiant lack of ornamentation of the cast iron⁷¹³.

Figure 98: St. Pancras Renaissance London hotel: grand staircase.

Figure 99: St. Pancras Renaissance London hotel: grand staircase. showing the exposed structural cast iron beneath the stairs, in contrast to the decorative wrought iron of the balustrades

⁷⁰⁸ McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. p41.

⁷⁰⁹ Ruskin, J. (1857). *The seven lamps of architecture*. Wiley & Halsted. Ruskin, J. (2005). *The seven lamps of architecture*. [1880] Electric Book Company. Bradley, S. (2007). *St Pancras Station*. p56. McKean, J. (1994). *Crystal palace: Joseph Paxton and Charles Fox*. p28. Harries, K. (2000). *The ethical function of architecture*. pp30-31. Wigginton, M. (1996). *Glass in architecture*. pp46-47. Kruff, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. pp331-332.

⁷¹⁰ Kostof, S. (1977). *The architect: chapters in the history of the profession*. p198. Bradley, S. (2007). *St Pancras Station*. pp10, 16-17, 58. Armstrong, I. (2008). *Victorian glassworlds: glass culture and the imagination 1830-1880*. p109.

⁷¹¹ Bradley, S. (2007). *St Pancras Station*. pp109, 111. Armstrong, I. (2008). *Victorian glassworlds: glass culture and the imagination 1830-1880*. p58.

⁷¹² Armstrong, I. (2008). *Victorian glassworlds: glass culture and the imagination 1830-1880*. p58. Bradley, S. (2007). *St Pancras Station*. p111.

⁷¹³ Bradley, S. (2007). *St Pancras Station*. p111. Armstrong, I. (2008). *Victorian glassworlds: glass culture and the imagination 1830-1880*. p58.

1.4.7 Going Up? The Elevator and the Upward City

Although aesthetics, and particularly those concerning ‘bad work’ was an aspect of the brave new world about which architects were concerned, closer to home, more of the ordinary populace were concerned less with what their stairs looked like and whether or not they were decorative and more vexed with how many of them they had to walk up and down and how often⁷¹⁴. Unlike Crystal Palace and the great railway stations, the majority of the buildings of the time were not concerned with growing out, but growing up⁷¹⁵. The frenzy for mass production and consumption that accompanied the English industrial revolution had rapidly turned a previously, largely rural population into a burgeoning, urbanised one⁷¹⁶. The demand for space quickly outpaced supply however and consequently rapidly industrializing cities such as London, Manchester, Sheffield and Birmingham had to grow up rather than out prompting the development of tenement blocks, which in some areas could be five or six stories high and were served only by stairs⁷¹⁷. But stairs are tiring and it was not too long before occupants of these new tenement buildings – the wealthy ones that is – sought to overcome the inconveniently laborious and tedious ascent of multiple flights, prompting some unusual ideas. If the polymaths of the middle ages and the Renaissance have been among history’s most curious robotocists with their fascination for mechanical automata of all kinds, the Victorians, must be among the most prolific and enthusiastic (sometimes crazily so) inventioneers in history⁷¹⁸. The explosion of inventiveness and entrepreneuriality that occurred along with the progressive, steam-powered industrialization of the nineteenth century was extreme – anything that could be mechanized (whether it needed to be or not) and irrespective of whether it was industrial, agricultural or domestic, was, the only criteria was that it must demonstrate originality, or novelty, as it was also termed⁷¹⁹.

⁷¹⁴ Kelley, G. (2008). *Gone to the shops: shopping in Victorian England*. p18.

⁷¹⁵ Trabucco, D. (2010). *Historical evolution of the service core*. p42. Thomas, L. (2008). ‘As large as the situation of the columns would allow’ building cladding and plate glass in the Chicago skyscraper, 1885–1905. p399. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p133. Mitchell, S. (2009). *Daily life in Victorian England*. Second edition. p115.

⁷¹⁶ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p209. Kostof, S. (1995). *A history of architecture: settings and rituals*. pp576, 598. Kelley, G. (2008). *Gone to the shops: shopping in Victorian England*. pp2-4, 27, 76, 89. Logan, T. (2001). *The Victorian parlour*. pp7-8, 11, 20. Armstrong, I. (2008). *Victorian glassworlds: glass culture and the imagination 1830-1880*. pp198-202. Farrelly, L. (2007). *The fundamentals of architecture*. p130. Mitchell, S. (2009). *Daily life in Victorian England*. Second edition. p56. Logan, T. (2001). *The Victorian parlour*. p16. Sussman, H. (2009). *Victorian technology*. p98. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p193.

⁷¹⁷ Mitchell, S. (2009). *Daily life in Victorian England*. Second edition. pp58, 79-80. Kelley, G. (2008). *Gone to the shops: shopping in Victorian England*. p76. Logan, T. (2001). *The Victorian parlour*. p16. Sussman, H. (2009). *Victorian technology*. pp98-100. Logan, T. (2001). *The Victorian parlour*. p17.

⁷¹⁸ Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp209-210. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. p552. Sussman, H. (2009). *Victorian technology*. pp3-7, 11, 14, 70, 73-74.

⁷¹⁹ Bird, A. (1976). *Paxton’s palace*. p28. Sussman, H. (2009). *Victorian technology*. p22, 31-32. Sussman,

With respect to the circumvention of stairs, this did lead to some highly elaborate (and sometimes alarming) propositions but at any rate, by the latter half of the nineteenth century, hydraulic lifts were available and popular in the tenement blocks of the upper and middle classes and in the grand hotels, such as the Midland⁷²⁰. The social hierarchy of those who served and those who *were* served was carefully maintained however. Such elevators were for well to do occupants and guests while tradesmen and servants continued to use as always, ‘back’ stairs, carefully hidden from sight⁷²¹.

Figure 100: Edoux hydraulic lift 1888.

Figure 101: Amiot's stair climber, for serene ascent, 1889

H. (2009). *Victorian technology*. pp4-5, 139. Brolin, B. C. (1985). *Flight of fancy: the banishment and return of ornament*. pp122-123. Sussman, H. (2009). *Victorian technology*. p3. Watson, P. (2005). *Ideas, a history of thought and invention from fire to Freud*. pp552-553. Mitchell, S. (2009). *Daily life in Victorian England*. Second edition. pp3, 8, 13, 42, 59, 68, 71-72, 84, 122, 229, 237, 261, 268.

⁷²⁰ Bradley, S. (2007). *St Pancras Station*. p58. Armstrong, I. (2008). *Victorian glassworlds: glass culture and the imagination 1830-1880*. p108. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp178, 180.

⁷²¹ Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p63.

This fervour for the alleviation of self-powered vertical ascent in favour of the assisted was equally popular in the United States but unlike in England and France where architects had viewed cast iron and then steel with suspicion, the Americans had no such reservations⁷²². They were far more interested in the potential of such materials as cast iron to achieve height in their buildings, rather than the wide spans with which the English were preoccupied⁷²³. They were also eager to experiment⁷²⁴. In this they were ably assisted by Elisha Otis (1811-1861) who as early as 1854 had produced the first safety elevator, from 1875 onwards the cost effective production of steel (toughened and hardened iron) and from 1884 the development and ready availability of good quality reinforced concrete (concrete frame buildings had been worked on since the 1870s in America but when the builder Ernest Ransome patented his system of reinforcement in 1884 which was very inexpensive to produce, concrete construction accelerated⁷²⁵.) These combined developments vastly increased the ease with which heights could be scaled and people rapidly transported and were appreciated by American architects and engineers alike, enabling and encouraging an unprecedented level of vertical expansion and spatial experimentation, assisted also by a shortage of land and exorbitant rents⁷²⁶. This trend accelerated from 1892 when the New York building codes approved and incorporated the use of steel structure in building work in and from then on buildings of more than 16 stories were a regular feature on the skyline⁷²⁷. By the end of the nineteenth century, concrete was routinely reinforced by steel meaning in turn that longer stair spans could be more easily achieved, and, if designers were so inclined, cantilevered

stairs also⁷²⁸. For the most part however, designers were distinctly *uninclined* as they were far too busy seizing upon the elevator to create buildings of unprecedented height. These architects included Louis Sullivan (1856-1924) who designed the world's first skyscrapers by adhering to his premise that 'form follows function', by which he meant that rather than following historical, aesthetic precedents or ideals, that architectural form should be created as a response to the activities that the form must house⁷²⁹. As a result, the sight of buildings such as Sullivan's Schiesinger and Mayer Department Store (later the Carson Pirie Scott building) in Chicago (1899), came as a considerable shock to many architects, especially the English who were still fondly cherishing their (variously) neo-classical and gothic inclinations. Even in Chicago, which having been devastated by the Great Fire in 1871 had become *the* epitome of the new construction developments, the building caused a stir⁷³⁰. Its light steel frame structure was very simple in principle and clearly expressed, in combination with vast bay-wide windows, the removal of all the usual (expected) classical ornamentation and an undeniable height - twelve stories⁷³¹. Whilst not excessively tall, either in its time or now, it is widely held to be a precursor of the modern skyscrapers as Sullivan did not subscribe to the traditional emphasis upon the horizontality of the building that was prevalent at the time, but instead wished to emphasise the inherent verticality, declaring that a skyscraper

must be tall, every inch of it tall. . . . It must be every inch a proud and soaring thing, rising in sheer exaltation that from bottom to top it is a unit without a single dissenting line⁷³².

⁷²² Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p133.

⁷²³ Trabucco, D. (2010). *Historical evolution of the service core*. p42. Thomas, L. (2008) 'As large as the situation of the columns would allow' building cladding and plate glass in the Chicago skyscraper, 1885-1905. p399. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p133.

⁷²⁴ Goodwin, J. (2001). *Otis: giving rise to the modern city*. p47. Timberman, J. (2003). *The footprint of the twentieth century: American skyscrapers and modernist poems*. p104. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. pp261-262.

⁷²⁵ Bukowski, R. W. (2009). *Emergency Egress from buildings. part 1: history and current regulations for egress systems design*. p167. Bradley, S. (2007). *St Pancras Station*. p108. Sennot, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. p753. Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p35. Slaton, A. E. (2001). *Reinforced Concrete and the Modernization of American Building, 1900-1930*. pp16-18, 118. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p262.

⁷²⁶ Spens, M. (1995). *Staircases: Detail in Building*. p12. Templer, J. A. (1992). *The staircase history and theories*. pxi. Trabucco, D. (2010). *Historical evolution of the service core*. p42. Goodwin, J. (2001). *Otis: giving rise to the modern city*. p45. Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. p35. Sennot, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. p753. Timberman, J. (2003). *The footprint of the twentieth century: American skyscrapers and modernist poems*. p104. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p253. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp178-179.

⁷²⁷ Bukowski, R. W. (2009). *Emergency Egress from buildings. part 1: history and current regulations for egress systems design*. p167. Leslie, T. (2010). *Built like bridges: iron, steel, and rivets in the nineteenth-century skyscraper*. pp235-236. Trabucco, D. (2010). *Historical evolution of the service core*. p43. Leslie, T. (2008) 'As large as the situation of the columns would allow' building cladding and plate glass in the Chicago skyscraper, 1885-1905. p399. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p2547.

⁷²⁸ Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p35

⁷²⁹ Farrelly, L. (2007). *The fundamentals of architecture*. pp56, 130. Sennot, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. p458. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p261.

⁷³⁰ Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. p54. Trabucco, D. (2010). *Historical evolution of the service core*. p42. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp134-135. Farrelly, L. (2007). *The fundamentals of architecture*. p130. Sennot, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. p459. Palmer, A. L. (2008). *Historical Dictionary of Architecture*. p253.

⁷³¹ Farrelly, L. (2007). *The fundamentals of architecture*. pp56, 130. Nash, Eric. (2005). *Manhattan skyscrapers: revised and expanded edition*. p3.

⁷³² Nash, Eric. (2005). *Manhattan skyscrapers: revised and expanded edition*. pp1, 3. de Botton, A. (2006) *The architecture of happiness*. pp215-217.

Until the development of the elevator and these new building materials, the provision of additional exits from such tall buildings as Sullivan's had not really been thought of however, largely because buildings were just not that tall⁷³³. Previously, the higher the building the thicker the masonry walls of the lower floors must be, which reduced the availability of lettable floor area – economic constraints thereby set height limitations to a usual maximum of eight or so stories⁷³⁴. Because of this, ladders typically sufficed for emergency exits⁷³⁵. It was not until 1860 when a fire in a New York city tenement building killed ten women and children trapped on the upper floors that the city devised its first fire exit regulations⁷³⁶. From this point every such tenement house must have either a fireproof towered stairway or a landing at each floor on the exterior of the building connected by stairs (the enforced provision of interior stairways had been resisted by landlords anxious not to lose floor rental area. And 'fireproof' did not mean fire *resistant* as we would understand today, it actually meant 'not wood', which therefore meant iron⁷³⁷.) Periodic revisions to the fire regulations over the next decade saw the requirement for fire escapes extend to other buildings also such as factories, hotels, boarding houses and offices⁷³⁸. Unfortunately this stipulation did not extend to specifying exactly what form these escapes should take, which led to some highly unsuitable propositions including ropes, escape chutes, basket hoists and other assorted oddities, to be variously attached and unattached to buildings. Landlords wishing to feign compliance rather than effect genuine effort could easily claim themselves to have complied with the law by adopting one of these unsuitable designs, rather than something more well-contrived⁷³⁹. By the 1890s, most large American cities required fire escapes on many types of buildings but some architects despaired of the insensibility of the suggestions as to how to manage emergency egress. Samuel Sloan declared that the intent to install balconies between windows to be linked by ladders as 'a most stupid contrivance' given that anyone elderly, very young or infirm would not be able to use them and would he observed – entrapped - simply 'roast as if on a gridiron'⁷⁴⁰. Not long after he attacked the 'iron ladders clamped against the wall' as 'worse than useless because they are deceptive, giving

the appearance of an escape without the reality'⁷⁴¹. He himself favoured the protection of regular stairways by walling them in and implementing iron doors at the entries. This sensible solution was adopted eventually, unfortunately just not until the twentieth century by which time many people had lost their lives in fires as a result of it being their ill-fortune to inhabit ineffectively designed, inadequately legislated and poorly managed tall buildings⁷⁴².

Figure 102: The Lascale fire escape, a rope-type fire escape, disguised as a washstand, 1878.

Figure 103: Oppenheimer fire escape, parachute and overshoes, 1879. Incredibly, this was actually granted a patent

⁷³³ Bukowski, R. W. (2009). *Emergency Egress from buildings. part 1: history and current regulations for egress systems design*. p167. Wermiel, S. E. (2003). *No exit: the rise and demise of the outside fire escape*. p259. Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. p65.

⁷³⁴ Goodwin, J. (2001). *Otis: giving rise to the modern city*. p45. Nash, Eric. (2005). *Manhattan skyscrapers: revised and expanded edition*. pxi.

⁷³⁵ Wermiel, S. E. (2003). *No exit: the rise and demise of the outside fire escape*. p259.

⁷³⁶ Wermiel, S. E. (2003). *No exit: the rise and demise of the outside fire escape*. p259.

⁷³⁷ Wermiel, S. E. (2003). *No exit: the rise and demise of the outside fire escape*. p259.

⁷³⁸ Wermiel, S. E. (2003). *No exit: the rise and demise of the outside fire escape*. p261.

⁷³⁹ Wermiel, S. E. (2003). *No exit: the rise and demise of the outside fire escape*. p261-262.

⁷⁴⁰ Wermiel, S. E. (2003). *No exit: the rise and demise of the outside fire escape*. p268.

⁷⁴¹ Wermiel, S. E. (2003). *No exit: the rise and demise of the outside fire escape*. p268-270

⁷⁴² Bukowski, R. W. (2009). *Emergency Egress from buildings. part 1: history and current regulations for egress systems design*. p167. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp115, 117, 173.

By the time the stair as interior fire escape had become more effectively legislated into these emerging sky-giants of Chicago and New York, the elevator already ruled⁷⁴³. This stair was rapidly relegated to the status of standby system, a secondary access way, necessary for emergency egress, but not intended for general use and thus it became dismissed – hidden, unseen and little used⁷⁴⁴. Without any expectation that it contribute to the experience of the building in any meaningful way, the necessity or desire for it to be aesthetically interesting or pleasing in public and commercial buildings consequently diminished to building owners and developers, not worth the energy, time or expense of imbuing with delight⁷⁴⁵. It quickly became reduced to its original status of useful, functional tool. This dismissal has been furthered by the capitalistic treatment of space, and consequently architecture, as commodity in which a restricted supply of land means that the minimum possible must be expended on unlettable floor areas like fire escape stairs if the maximum return on investment is to be gained⁷⁴⁶. (Ironically of course, elevators have not been completely irritant free for building developers. They may take up less space, but as building heights increased, the need to provide more elevators to service ‘batches’ of floors developed, a necessity to reduce slow journey time. More elevators however, are more expensive and require more floor area, reducing lettable space⁷⁴⁷.) Such stairs then, although they must now be present for safety purposes, are now frequently built to the minimum possible standards, to include little in the way of comfort, ambience or convenience⁷⁴⁸. The danger with creating such an uncared for space (except in functional terms) is that, if perceived as unpleasant, people will not use it, even to walk one flight of stairs between floors, and crime or undesirable activities

can take place, thereby perpetuating the problem still further⁷⁴⁹. This in turn requires the introduction of security systems such as swipe card controlled entry, a further expense⁷⁵⁰. But if elevators were initially considered thieves of space, then stairs therefore, must now surely be comparable to robber-barons, for the voracity and greed with which they demand and consume appropriate space in accordance with building regulations that exist to ensure safety. Fire escape and stair construction tends to be a generally unenthusiastic affair then⁷⁵¹. The elevator is a device one suspects might be rather more beloved of engineers and building managers than architects, for its more efficient use of space, but at least it remains lauded. The fire escape stair is lauded by neither engineers, owners, developers, and especially not by architects, for whom, unallowed to expend any aesthetic attention on them they become a tedious, regulatory chore that impinge upon, or as Alberti would say, ‘disturb’ the floor plan and make its satisfactory resolution slower and more difficult. Since the terrorist attacks on the world trade center there have been calls for the installation of fire safety elevators in skyscrapers than may be used to accelerate building evacuation⁷⁵². It is possible therefore that one day emergency egress stairs might be removed entirely from our very tall buildings, and equally as possible that no one, least of all architects, who in any case much prefer to spend time designing things that will be seen (leaving the unseen to the engineers), will mourn their passing⁷⁵³.

⁷⁴³ Trabucco, D. (2010). *Historical evolution of the service core*. pp43-44.

⁷⁴⁴ Templer, J. A. (1992). *The staircase: history and theories*. pxi. Spens, M. (1995). *Staircases: Detail in Building*. p6.

⁷⁴⁵ Templer, J. A. (1992). *The staircase: history and theories*. ppx-xi. Newman, O. (1972). *Defensible space; crime prevention through urban design*. p34.

⁷⁴⁶ Trabucco, D. (2010). *Historical evolution of the service core*. p45. Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. pp69, 129. Leslie, T. (2008) ‘As large as the situation of the columns would allow’ *building cladding and plate glass in the Chicago skyscraper, 1885–1905*. p399. Andreoli, E. (2006). Identity and Memory in The Modern Metropolis: Elements For a Discussion. The Case of Sao Paulo. pp405-406. In Madge, J. and Peckham, A. (Ed[s.]), *Narrating architecture: a retrospective anthology* (pp401-407). Blanc. A. and Blanc, S. (2001). *Stairs, second edition*. pp3, 29, 92. Till, J. (2009). *Architecture depends*. pp85, 125, 182, 189. Fisher, T. R. (2000). In the scheme of things: alternative thinking on the practice of architecture. pp40-41. Quantrill, M. (1974). *Ritual and response in architecture*. p108. Scott, A. (2005). *Falls on stairways – literature review*. p2. Sennot, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. p459. Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p21. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. pp5, 200. Timberman, J. (2003). *The footprint of the twentieth century: American skyscrapers and modernist poems*. p104. CIBSE. (2005). *Transportation systems in buildings, CIBSE guide D, 3rd ed*. pp2-3.

⁷⁴⁷ Trabucco, D. (2010). *Historical evolution of the service core*. p47. Sebestyen, G. and Pollington, C. (2003). *New architecture and technology*. p57. Sennot, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. p754. Strakosch, G. and Caporale, R. S. (2010). *The vertical transportation handbook*. pp385-386. Allsop, B. (1974). *Towards a humane architecture*. pp13-14, 53-55.

⁷⁴⁸ Scott, A. (2005). *Falls on stairways – literature review*. p10. Blanc. A. and Blanc, S. (2001). *Stairs, second edition*. pp3, 29, 115.

⁷⁴⁹ Newman, O. (1972). *Defensible space; crime prevention through urban design*. p34. Exner, U. and Pressel, D. (2009). *Spatial Design*. p21. CIBSE. (2005). *Transportation systems in buildings, CIBSE guide D, 3rd ed*. p2-13, 2-14, 3-16, 13-10.

⁷⁵⁰ Strakosch, G. and Caporale, R. S. (2010). *The vertical transportation handbook*. pp203, 517, 515, 566, 568. Blanc. A. and Blanc, S. (2001). *Stairs, second edition*. p178.

⁷⁵¹ Blanc. A. and Blanc, S. (2001). *Stairs, second edition*. pp3, 115.

⁷⁵² Trabucco, D. (2010). *Historical evolution of the service core*. pp43-44. Bukowski, R. W. (2009). *Emergency egress from buildings. part 1: history and current regulations for egress systems design*. pp184-186, 190.

⁷⁵³ Blanc. A. and Blanc, S. (2001). *Stairs, second edition*. p92. Trabucco, D. (2010). *Historical evolution of the service core*. pp43-44. Strakosch, G. and Caporale, R. S. (2010). *The vertical transportation handbook*. pp129, 566.

1.4.8 Aberrant Architecture: A Peculiar Process

Blessed the ancient architect, who was originally a muratore or mason (a beautiful word derived from the Latin mura, wall). We architects of today have difficulties in understanding many things and have no feeling for them because we stared out as students (what a mistake!) Things live in our intelligence before they do in our senses⁷⁵⁴. Gio Ponti.

The staircase belongs to space⁷⁵⁵.

Shortly before the pragmatic preoccupations of space hungry capitalists concerned with maximising profits and minimising stairs were about to eventuate with the onset of the 1820s and the English industrial revolution, in 1818, the German author E.T.A Hoffman (1776-1822) had written his book, Rat Krespel (1818, *Councillor Krespel*) a tale of (amongst other things) apparent madness, aberrant architectural design and an unexpectedly triumphant result⁷⁵⁶. Anthony Vidler examines the story in his book *The architectural uncanny: essays in the modern unhomely* (1992) and reviews the antics of said Councillor, who, known as ‘one of the most eccentric of men’ undertakes to build a house⁷⁵⁷. To the astonishment and curiosity of all about him, his friends, neighbours and acquaintances, Krespel spurns the services of an architect and the convention of plans, demanding instead that his masons construct four walls (upon a square foundation, pre-prepared by Krespel), each of which is entirely window and door-less⁷⁵⁸. No height is supplied, the builders must simply build until one day, Krespel deems the walls complete and cries ‘stop’⁷⁵⁹. Further astonishment is provoked by the manner in which he determines the situating of his door, which comprises ‘running around’ and ‘pacing up and down his garden, moving toward the house in every direction’ until he, ‘running his hard nose against the wall ... cried, come here, come here men, make me a door right here’⁷⁶⁰. Door completed, this apparently (to those who viewed it) random mode of assignation was likewise applied to the placement and dimensions of the internal partitions

and windows, which of the latter, no two were alike⁷⁶¹. Consequently, the exterior of the house was deemed by all who saw it to be ‘madness’, lacking the familiarity of the usual order and legibility⁷⁶². Yet astonishingly, the interior, despite having been subjected to the same apparently random manner of design was unanimously acknowledged and praised as the epitome of ease, comfort and convenience⁷⁶³.

Whilst Krespel’s house contains stairs that play only a small part in the scheme of things, the story is of particular relevance and interest with regard to the stair and its presence in our buildings, due to Krespel’s preference for and use of volumetric, spatial, haptic design in the planning and construction of his house, rather than using the traditional design process favoured by architects, the horizontal plan, to which the stair has typically been subordinate⁷⁶⁴. Vidler notes however, that whilst entirely unconventional and therefore startling, Krespel’s repression of the visual in favour of the haptic and experiential as the primary means of design, was in fact thoroughly *logical*. Rather than *his* behaviour being peculiar, it highlights the peculiarity of those about him in their preference for constructing a three dimensional entity (to be inhabited by three dimension occupants) solely upon the basis of two dimensional paper drawings that exist in the visual sense only, from which no genuine spatial experience and understanding can be derived⁷⁶⁵. It is *their* behaviour that speaks of madness, not his. That the consequences of his peculiar actions result in an unfamiliar and bizarre *public* exterior, that simultaneously accommodates a comfortable and comforting *private* interior, are just as difficult for others to reconcile, as his apparently bizarre actions

⁷⁵⁴ Ponti, G. (1960). *In praise of architecture*. pp95-96.

⁷⁵⁵ Ponti, G. (1960). *In praise of architecture*. p118.

⁷⁵⁶ Hoffman, E.T.A. (2004). *Councillor Krespel*. Kessinger Publishing. It should be noted that the triumph was limited to the architecture, in terms of both the process of its devising and the end result; the story itself however, it must be acknowledged, does not have a happy ending.

⁷⁵⁷ Vidler, A. (1992). *The architectural uncanny: essays in the modern unhomely*. pp29-33, 36.

⁷⁵⁸ Potie, P. (2008). *Sophisticated Geometry in Baroque Composition*. In Carpo, M. and Lemerle, F. [Ed.s]. *Perspective, projections and design technologies of architectural representation*. (p106). Vidler, A. (1992). *The architectural uncanny: essays in the modern unhomely*. p30. Hoffman, E.T.A. (2004). *Councillor Krespel*. pp1-2. Colquhoun, A. (2002). *Modern architecture*. p82.

⁷⁵⁹ Vidler, A. (1992). *The architectural uncanny: essays in the modern unhomely*. p29.

⁷⁶⁰ Vidler, A. (1992). *The architectural uncanny: essays in the modern unhomely*. pp29, 32.

⁷⁶¹ Hoffman, E.T.A. (2004). *Councillor Krespel*. pp2-3. Vidler, A. (1992). *The architectural uncanny: essays in the modern unhomely*. p29.

⁷⁶² Vidler, A. (1992). *The architectural uncanny: essays in the modern unhomely*. pp30, 31-32.

⁷⁶³ Hoffman, E.T.A. (2004). *Councillor Krespel*. p3. Vidler, A. (1992). *The architectural uncanny: essays in the modern unhomely*. pp30, 32.

⁷⁶⁴ Turnbull, D. (2000). *Masons, tricksters and cartographers: comparative studies in the sociology of scientific and indigenous knowledge*. pp55-58, 95. Kostof, S. (1995). *A history of architecture: settings and rituals*. p379. Habermann, K. J. (2003). *Staircases: design and construction*. pp12, 14. Alberti, L. B. and Rykwert, J. [trans.] (1991). *De re aedificatoria*. p31. Templer, J. A. (1992). *The staircase history and theories*. p72. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp80, 113-114, 233. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p157. Palladio, A., Tavernor, R. and Schofield, R. [Trans.s]. (2002). *The four books on architecture*. pp12, 66-67, 70, 105, 124, 132, 142, 253. Mitrovic, B. (2004). *Learning from Palladio*. pp39, 76, 73, 75. Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p18. Evans, R. (1997). *Translations from drawings to buildings and other essays*. 52, 56-57, 64-65. Rybczynski, W. (1986). *Home a short history of an idea*. pp37, 41, 66, 87-88, 108, 110, 165. Rosner, V. (2005). *Modernism and the architecture of private life*. pp63-64, 71. Rice, C. (2007). *Emergence of the interior: architecture, domesticity, modernity*. pp63, 73. Goldberger, P. (2009). *Why architecture matters*. p129. Spens, M. (1995). *Staircases: Detail in Building*. p7-8. Gwilt, J. (1842). *An encyclopaedia of architecture: historical, theoretical, and practical*. p764. Potie, P. (2008). *Sophisticated Geometry in Baroque Composition*. In Carpo, M. and Lemerle, F. [Ed.s]. *Perspective, projections and design technologies of architectural representation*. (p106). Jeanneret, C-E. (2007). In Braham, W. W. and Hale, J. A. [Ed.s] *Rethinking technology: a reader in architectural theory*. p30.

⁷⁶⁵ Potie, P. (2008). *Sophisticated Geometry in Baroque Composition*. In Carpo, M. and Lemerle, F. [Ed.s]. *Perspective, projections and design technologies of architectural representation*. (p106). Vidler, A. (1992). *The architectural uncanny: essays in the modern unhomely*. p33.

in generating them however. The house does not invite, it repels. It is not welcoming, it is guarded. It is a reversal of the expectations that we hold for our buildings, that even if our status as strangers forbids us access to their interiors, their exteriors are readable and recognisable, comfortable and familiar, ready representations of what it means to be domestic. In short, a house should look like a house, a bank should be bank like, a church should very obviously be a church: as we build so shall we see⁷⁶⁶. To do otherwise is the ultimate rebuff of classical architectural tradition and expectations⁷⁶⁷. Krespel's upsetting of convention, his abandonment of the usual, two dimensional planning conventions for the abnormal, three dimensional process discards the traditional in favour of the novel, and as a result confounds our expectations as to how our buildings should be designed, constructed, occupied, present themselves, present – represent – us and interact with the contexts in which they exist. His reversal of our expected relationships, the haptic for the visual, the spatial for the two dimensional, the public and private, the interior and exterior, is an unwelcome reminder of the emphasis we place upon the visual aesthetic, on both paper and off it, to create a world and buildings that we will perceive and inhabit most likely in an entirely different way than was envisaged by its designers, but which logically, can lead to no other result.

It is notable however, that Krespel's preference for sensory design, whilst entirely strange and astonishing to all about him, although unusual, is not unknown amongst contemporary architects. Both Luis Barragan and Adolf Loos, great masters of modern architecture, disliked architectural drawings, regarding them as mere necessities for the communication to builders only, certainly not as a *means* of designing, which nothing but the experience of construction, *during* construction could supply⁷⁶⁸. Barragan in fact disliked the plan so immensely that he would frequently refuse to supply more than the roughest measurements while Loos as noted earlier was equally disproving of the expenditure of excessive effort spent upon drawings, at the neglect of the actual experience that was intended to result⁷⁶⁹. Both much preferred to consult with their workmen on site and neither would hesitate to make changes in mid build if they considered it necessary, and on occasion would not decide the outcome of some aspects of a building until they were already half built⁷⁷⁰. Loos in particular would begin to

build without completing drawings and in 1900 began to leave off including dimensions in his drawings, believing that this practice 'dehumanised design'⁷⁷¹. Instead his preference was for physical, human experience as guide;

If I want a wood panelling or wainscot to be of a certain height. I stand there. Hold my hand at that certain height. And the carpenter makes his pencil mark. Then I step back and look at it from one point and from another. Visualizing the finished result with all my powers. This is the only human way to decide on the height of a wainscot, or on the width of a window⁷⁷².

In this way, Loos would evade the need for drawings. Like Councillor Krespel's unconventional but successful approach to the design and construction of his house, Loos' body was his guide, his mind his three dimensional 'drawing board' and interaction - direct communication - with his craftsmen-builders informed his design process⁷⁷³. By privileging synchronous sensory experience rather than conventional visual planning, dependent on and subordinate to paper figures, he could work, unhindered, in freedom⁷⁷⁴. His three dimensional spatial machinations resisted ready reading from the two dimensional page as a result, and often caused considerable controversy, but for his clients, those daring enough to risk it, they resulted in houses of such comfort that the sometimes years long process of design and construction was completely worth the wait⁷⁷⁵.

⁷⁶⁶ Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p33.

⁷⁶⁷ Vidler, A. (1992). *The architectural uncanny: essays in the modern unhomely*. p36.

⁷⁶⁸ Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p140, 269-270. Bock, R. (2007). *Adolf Loos: works and projects*. p10.

⁷⁶⁹ Rispa, R. [Ed.] (1996). *Barragan: the complete works*. pp26, 79. Zanco, F. [Ed.] (2001). *Luis Barragan: the quiet revolution*. pp100, 224. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p269.

⁷⁷⁰ Bock, R. (2007). *Adolf Loos: works and projects*. pp10, 36. Tournikiotis, P. and A. Loos (1994). *Adolf Loos*. p10. Risselada, M. (1988). *Raumplan versus plan libre: Adolf Loos and Le Corbusier, 1919-1930*. p127. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p140.

⁷⁷¹ Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p279. Risselada, M. (1988). *Raumplan versus plan libre: Adolf Loos and Le Corbusier, 1919-1930*. p127.

⁷⁷² Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. pp265, 269.

⁷⁷³ Colquhoun, A. (2002). *Modern architecture*. pp83-82. Pfeifer, G., Ramcke, R. Achtziger, J. Zilch, K. and Schatz, M. (2001). *Masonry construction manual*. p42.

⁷⁷⁴ Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p140.

⁷⁷⁵ Mallgrave, H.F (2005). *Modern architectural theory: a historical survey, 1673-1968*. pp195, 216. Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. p39.

2.3.4 Vertical Volume versus. The Horizontal Plane

One of the reasons for Loos development of an unconventional design process was undoubtedly the equally unconventional manner in which he embarked upon an architectural career. The son of a mason and sculptor, Loos had arrived at architecture in a somewhat roundabout and erratic fashion via studies in architecture, mechanics, building technology, mechanical construction and eventually architecture again, followed (unusually) by travels in America where he worked as a mason and a draftsman⁷⁷⁶. It was in America that he encountered the interiors of the architect Henry H. Richardson⁷⁷⁷. Loos was delighted with the simplicity and classicism and the manner in which the interrelationship of rooms was emphasised, rather than their privacy and individuality, as was typical in Austria⁷⁷⁸. Richardson combined openness and seclusion in his interiors by the skilful use of recesses and carefully controlled manipulation of height and in this manner was able to successfully, elegantly, fulfil the combined living, work and social needs of his clients, a skill of which Loos was most admiring⁷⁷⁹. In 1896 Loos returned to Europe and Vienna and set his mind and not inconsiderable intellectual curiosity to theoretical study. He greatly respected two of his forerunners in particular; the Viennese architects Otto Wagner (1841-1918) and Gottfried Semper (1803-1879)⁷⁸⁰. Wagner had initially practised in the historic tradition but had broken away from this to experiment with the new⁷⁸¹. His inaugural lecture, published in 1895, had startled the conservative Austrian architectural stronghold with its discarding of the traditional in favour of the new;

it may be regarded as proved that art and artists always represent their own epoch and that new forms originate from new construction, new materials, new human tasks and ideas. Draw your conclusions from these tenets, and you must agree that this way, all modern forms must correspond to new materials and the new requirements of our time, if they are to fit modern mankind⁷⁸².

Wagner's source and inspiration had in turn been Gottfried Semper, an Italianate architect and theoretician of materialism⁷⁸³. Semper held that humanity had developed the building for a very simple and practical purpose, the housing and protection of the hearth, and that from this experience of the differentiation of a private, inner world from a public, outer world, the psychological awareness of and desire to create an interior had arisen⁷⁸⁴. Enclosure satisfied both physical and psychological desires and could be achieved relatively simply, by a membrane of fencing or weaving. It was therefore, this sensation of enclosure that was foremost for Semper⁷⁸⁵. The structure required for supporting it was of no interest or importance – the crucial matter was space and its division to affect *mood*⁷⁸⁶. As he declared it, 'in the best work, the material of the enclosure is vaporized and physical substance is superseded by a vibrant aura'⁷⁸⁷.

This emphatic focus upon spatiality and sensation epitomized to Loos the critical nature and role of architecture (and therefore the architect) to serve humanity by fulfilling the fundamental human need for comfort afforded by retreat, enclosure, privacy and intimacy⁷⁸⁸. Consequently, and contrary to the prevailing European ethos of the times, Loos did not subscribe to the notion of architecture as *art* (except in exceptional circumstances such as the provision of the monument or the tomb), believing that the deliberate creation of a building intended for habitation in this vein was *not* architecture⁷⁸⁹. Such a construction was instead a fallacy - a pretence - created not to serve the physical or psychological needs of those who would inhabit it but the ego of the architect who devised it and the aesthetic fancies of those who would only ever experience it visually as an externalised object⁷⁹⁰. Loos' attention was reserved for the occupants of his buildings, his houses in particular, and his desire for them all was to possess *reticence* so that 'human beings, who felt the need, however little money they might have 'could be 'at home' ... 'in quiet communion' 'alone and able to concentrate'⁷⁹¹.

⁷⁷⁶ Bock, R. (2007). *Adolf Loos: works and projects*. p13. Tournikiotis, P. and A. Loos (1994). *Adolf Loos*. p9. Pevsner, N. (1966). Introduction. In Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. (p13). Mallgrave, H.F (2005). *Modern architectural theory: a historical survey, 1673-1968*. pp215, 218.

⁷⁷⁷ Kruff, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. p365. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p310-311. Bock, R. (2007). *Adolf Loos: works and projects*. P59.

⁷⁷⁸ Lustenberger, K. (1994). *Adolf Loos*. p35. Bock, R. (2007). *Adolf Loos: works and projects*. p13. Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. p39.

⁷⁷⁹ Lustenberger, K. (1994). *Adolf Loos*. p35.

⁷⁸⁰ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p53. Kruff, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. p364.

⁷⁸¹ Sennot, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. p165. Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. p30.

⁷⁸² Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. p14.

⁷⁸³ Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p14.

⁷⁸⁴ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p53. Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. p14.

⁷⁸⁵ Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. p14.

⁷⁸⁶ Kruff, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. p364. Mallgrave, H.F (2005). *Modern architectural theory: a historical survey, 1673-1968*. p218.

⁷⁸⁷ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p53.

⁷⁸⁸ Schezen, R. (1996). *Adolf Loos: architecture 1903-1933*. pp17-18. Bock, R. (2007). *Adolf Loos: works and projects*. pp10, 35, 65. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. pp264-265.

⁷⁸⁹ Bock, R. (2007). *Adolf Loos: works and projects*. p21. Kruff, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. p366. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. pp68, 252.

⁷⁹⁰ Kruff, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. p366. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p270.

⁷⁹¹ Tournikiotis, P. and A. Loos (1994). *Adolf Loos*. pp17-31. Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p45. Harries, K. (2000). *The ethical function of architecture*. p51.

The luxury - the secrecy and retreat – of Loos houses and thus that of their inhabitants, was assiduously implemented and guarded by him⁷⁹². As he declared, ‘the house should be mute on the outside and reveal all of its riches on the interior’⁷⁹³.

It was Loos houses – from with the Villa Karma (begun in 1903 and completed in 1906) to the last, the Winternitz house (1931) that indicated the full range of his talents, perhaps because they reflected his foremost concern – everyday living⁷⁹⁴. Each was a manifestation of his ethical intent of providing occupants with the comfort and ease he believed they deserved, through the volumetric manipulation of space. In occasional interviews or articles he would describe his unique manner of working

I do not design plans, façades, sections, I design space. Actually there is neither a ground floor, an upper floor or a basement, there are merely interconnected spaces, vestibules, terraces. Every room needs a specific height – the dining room a different one from the pantry – therefore the floors are varying levels. After this one must connect the spaces with one another so that the transition is unnoticeable and natural, but also the most practical, IT SEEMS THAT THIS IS A MYSTERY TO OTHER PEOPLE, BUT TO ME IT IS QUITE OBVIOUS.....⁷⁹⁵

For Loos then, space was not to be treated as surface but as volume⁷⁹⁶. Although he himself did not use the term Raumplan with regards to his approach it is the term that came to be associated with him, a result of Kulka, his long-time associate, defining Loos’ approach explicitly as

the solution of the plan in space ... the free thinking in space the arrangement of related spaces into a harmonic indivisible whole and into a spatially-efficient composition⁷⁹⁷.

This spatial plan, or plan of volumes, might have appeared simple in concept, but Loos devotion to the resolute crafting of the house as home through the exploration and refinement of the Raumplan, over the course of his working life, was anything but simple in execution⁷⁹⁸. His spatial palate consisted of simple, regular, classical volumes, cubes, rectangles and cylinders, with one usually dominant, large volume, a rectangle or a cube within which other smaller volumes would be interwoven and also from within which, thanks to reinforced concrete, they could be projected⁷⁹⁹. The overall volume was then enriched by the overlap of these spaces, freed from the confines of rigid storeys. For Loos, there was no necessity for a predetermined ground plane to exist – this was irrelevant to the meaningful division and construction of the interior, which was fluid according to purpose and need⁸⁰⁰. Instead it was Loos’ unwavering conviction that the house must have both a ‘meaningful centre’ and that the interior, and therefore the exterior, be constructed around and about this, rather than around (conventional and traditional) preoccupations as to the appearance of the exterior⁸⁰¹. So he would determine the size and positioning of the volumes by analysing their use requirements and having done so, begin his plan with the space which seemed to him the most important for living purposes and construct his plan around it. Crucially, spaces did not need to adhere to a single story, but could flow between levels and depending on their degree of significance and purpose could be given different heights as well as different sizes, a combination through which Loos would weave a careful articulation of horizontal and vertical circulation, incorporating both into spatial transitions⁸⁰². In this way, Loos would assemble the interior of his houses, puzzling together interlocking volumes that merged and separated in a sequential journey over several levels, connected by sightlines and several flights of stairs and through which he would weave a succession of rich, luxuriant materials and colours⁸⁰³.

⁷⁹² Mallgrave, H.F (2005). *Modern architectural theory: a historical survey, 1673-1968*. pp216, 218. Sennott, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. p16. Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. pp42-45. Tournikiotis, P. (1994). *Adolf Loos*. p17. Harries, K. (2000). *The ethical function of architecture*. p47. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. pp33, 35. Zanco, F. [Ed.] (2001). *Luis Barragan: the quiet revolution*. pp60, 96.

⁷⁹³ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p45. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. pp143, 274. Harbison, R. (2009). *Travels in the history of architecture*. p221.

⁷⁹⁴ Bock, R. (2007). *Adolf Loos: works and projects*. p11, 90. Harbison, R. (2009). *Travels in the history of architecture*. p221.

⁷⁹⁵ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p38. Kruff, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. pp364-365. Lustenberger, K. (1994). *Adolf Loos*. p36. Tournikiotis, P. (1994). *Adolf Loos*. p70. Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. p139.

⁷⁹⁶ Tournikiotis, P. (1994). *Adolf Loos*. p70.

⁷⁹⁷ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p38. Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. p59. Lustenberger, K. (1994). *Adolf Loos*. p35. Risselada, M. (1988). *Raumplan versus plan libre: Adolf Loos and Le Corbusier, 1919-1930*. p27. Coles, J. and House, N. (2007). *The fundamentals of interior architecture*. p30. Kruff, H-W. (1994). *A history of architectural theory: from Vitruvius to the present*. pp364-365. Risselada, M. (1988). *Raumplan versus plan libre: Adolf Loos and Le Corbusier, 1919-1930*. p27. Bock, R. (2007). *Adolf Loos: works and*

projects. p77.

⁷⁹⁸ Sennott, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. p166. Risselada, M. (1988). *Raumplan versus plan libre: Adolf Loos and Le Corbusier, 1919-1930*. pp78-79.

⁷⁹⁹ Bock, R. (2007). *Adolf Loos: works and projects*. p79. Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p39. Tournikiotis, P. (1994). *Adolf Loos*. pp17, 63, 72-73, 87.

⁸⁰⁰ Tournikiotis, P. (1994). *Adolf Loos*. p73. Bock, R. (2007). *Adolf Loos: works and projects*. p77.

⁸⁰¹ Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. pp139-140. Risselada, M. (1988). *Raumplan versus plan libre: Adolf Loos and Le Corbusier, 1919-1930*. p79. Bock, R. (2007). *Adolf Loos: works and projects*. p77. Tournikiotis, P. (1994). *Adolf Loos*. pp61, 66-67. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p33. Harbison, R. (2009). *Travels in the history of architecture*. p221.

⁸⁰² Risselada, M. (1988). *Raumplan versus plan libre: Adolf Loos and Le Corbusier, 1919-1930*. pp78-79. Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. pp139-140. Bock, R. (2007). *Adolf Loos: works and projects*. p77. Lustenberger, K. (1994). *Adolf Loos*. p37. See also Charles Moore on height in Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. p199.

⁸⁰³ Harbison, R. (2009). *Travels in the history of architecture*. pp221-222. Tournikiotis, P. and A. Loos (1994). *Adolf Loos*. p70. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. pp133, 255. Coles, J. and House, N. (2007). *The fundamentals of interior architecture*. pp30, 32. Bock, R. (2007). *Adolf Loos: works and projects*. p80. Gravagnuolo, B. (1988). *Adolf Loos: theory and works*. p203.

Whilst all of Loos houses were evidence of his lifelong desire to create comfort for his clients, it is generally agreed that the Villa Muller is the most complete spatial composition and expression of all Loos' residences, a superb physical resolution of his conceptual approach⁸⁰⁴. The client, Frantisek Muller, was a wealthy Czech industrialist, an engineer and co-owner of the highly successful building company Kapsa & Muller. The company specialized in reinforced concrete construction and had acquired a reputation for being progressive by undertaking difficult and unusual projects and employing new techniques and materials to achieve them⁸⁰⁵. The site Muller had selected was in Pilsen, on the edge of Prague, and was very steeply sloped⁸⁰⁶. This did not faze Loos in the least as he used it to his advantage to design a stepped interior floor plan comprising carefully designated levels⁸⁰⁷. A scheme showing preliminary sketches for four plans, transverse and longitudinal sections and an axonometric differs very little from the one Loos submitted to the city building department on December 1928, just two months after receiving the commission, demonstrating that in an extremely short space of time he had resolved an extraordinarily definitive solution⁸⁰⁸. This rapid and single minded evolution of idea from initial concept to developed scheme was even more remarkable given not just the intricate complexity of Loos spatial wranglings (which would have been challenging enough in themselves) but their positioning upon such a steeply sloped site and within a highly constrained shell⁸⁰⁹. The only thing more remarkable than this rapid and complete resolution was that Loos and Muller then actually managed to have the villa built with very few significant modifications⁸¹⁰. This achievement is perhaps more impressive when it is understood that (possibly to no-one's great surprise other than Loos) at the very first review on January the eighth the following year, Muller was denied a building permit⁸¹¹. The council had immediately noted two objections on being presented with the scheme, the first to the building's footprint (it was too big), the second to the building's height⁸¹².

Regulations restricted buildings within the area to a maximum of two stories, not including a basement and uninhabited attic space but the villa appeared to possess a number somewhere between three and five – officials could not actually be certain as they could not read Loos baffling drawings – hence consternation⁸¹³. Somehow Loos eventually managed to persuade the council that the house was in fact only a two story building (ground plus first floor) and after *eleven* attempts obtained approval, which was just as well as Muller had not bothered to wait for a building permit to be issued and had already begun construction⁸¹⁴.

Figure 104: Villa Muller, 1928, a cause of neighbourhood consternation

⁸⁰⁴ Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. pp139-140. Sennott, R. S. [Ed.] (2004). *Encyclopedia of 20th century architecture*. p166. Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. pp16, 38. Lustenberger, K. (1994). *Adolf Loos*. pp35, 160. Gravagnuolo, B. (1988). *Adolf Loos: theory and works*. p201. Schezen, R. (1996). *Adolf Loos: architecture 1903-1933*. pp19, 21, 124, 142. Coles, J. and House, N. (2007). *The fundamentals of interior architecture*. p30.

⁸⁰⁵ Lustenberger, K. (1994). *Adolf Loos*. p160. Tournikiotis, P. (1994). *Adolf Loos*. p92. Schezen, R. (1996). *Adolf Loos: architecture 1903-1933*. p142.

⁸⁰⁶ Lustenberger, K. (1994). *Adolf Loos*. p160.

⁸⁰⁷ Tournikiotis, P. (1994). *Adolf Loos*. p83. Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p27. Bock, R. (2007). *Adolf Loos: works and projects*. p33.

⁸⁰⁸ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p24.h

⁸⁰⁹ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p27.

⁸¹⁰ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p24.

⁸¹¹ Bock, R. (2007). *Adolf Loos: works and projects*. p39. Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. pp27, 151.

⁸¹² Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p27.

⁸¹³ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p27.

⁸¹⁴ Gravagnuolo, B. (1988). *Adolf Loos: theory and works*. p201. Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. pp27, 34, 56.

Despite an unprepossessing beginning, by the time construction was completed Loos' unlikely marriage of modern functionalism and English Classicism became the most resolute manifestation of his spatial convictions⁸¹⁵. The planar austerity of the cubic, white exterior gives no hint to the luxurious and sinuous interior contained and hidden within, a complicated puzzle of interlocking volumes and intricately entwined spatial sequences⁸¹⁶. As was typical with Loos, this interior was divided into two zones, served space (further divided into day and night areas) and serving space⁸¹⁷. The primary served space of the Villa Muller - the 'meaningful centre' that was always his starting point - was for Loos, the salon and the other main living areas - the lounge, dining room and library. Around this and the central stairway and within the unyielding immobile exterior, Loos skilfully interwove a complex blend of volumes on different levels into a series of multiple, changing vistas and sightlines⁸¹⁸. As the occupant ascends and descends levels, the gaze is directed both up and down so that it is possible to view a space, from above or below, which one yet cannot access immediately, creating an odd sensation of simultaneous anticipation and relaxation⁸¹⁹. Spaces - places - that appear to exist in and of themselves - that appear autonomous due to changes in height or floor level, and sometimes a seeming absence of stairs by which they may be accessed - simultaneously appear to blend into one another through these visual interconnections⁸²⁰. The blurring of spatial boundaries is further increased however both by multiple changes of scale and elements that can serve more than one function. A platform may be both a stair and a seat - simultaneously - as a result, it is not entirely clear when it is which and therefore exactly what it is, it shifts constantly between both states, becoming both, each and neither.

This morphing of scales occurs everywhere, as a step expands to become a platform for seating, a ledge becomes a wall as an occupant descends a stairway or a floor contracts to become a step⁸²¹. Smaller levels project into a larger space - or is that retreat from it? - it is unclear which⁸²². Steps and platforms both protrude from and cut into mass, niches do likewise and Loos' overlapping of materials from one apparently distinct area or element into another blurs boundaries still further⁸²³. But none of these complex scalar ambiguities are random, all are carefully scaled to the human body, to serve the need for comfort, whether it be to provide a comfortable place to sit with company, or a niche to retreat to in privacy, a ledge built into a wall to lie upon, or a wall cut away to become a ledge to see through⁸²⁴. And throughout the whole, vision is always guided inwards to prevent unwelcome awareness of and intrusion by the outside world, except when, in a favourite tactic of Loos, the roof of one space becomes simultaneously a terrace to serve another and the inhabitant is invited to re-enter the outside world. Even then however, they are protected against intrusion from casual onlookers by their elevation, with others unable to reach or see them⁸²⁵.

Figure 105: Villa Muller interior

Figure 106: Villa Muller interior

⁸¹⁵ Tournikiotis, P. (1994). *Adolf Loos*. p17, 59. Schezen, R. (1996). *Adolf Loos: Architecture 1903-1933*. pp21, 142.

⁸¹⁶ Harbison, R. (2009). *Travels in the history of architecture*. pp221-222. Tournikiotis, P. (1994). *Adolf Loos*. p92. Lustenberger, K. (1994). *Adolf Loos*. p160. Gravagnuolo, B. (1988). *Adolf Loos: theory and works*. p201.

⁸¹⁷ Tournikiotis, P. (1994). *Adolf Loos*. p71. Bock, R. (2007). *Adolf Loos: works and projects*. p79.

⁸¹⁸ Bock, R. (2007). *Adolf Loos: works and projects*. p9. Lustenberger, K. (1994). *Adolf Loos*. p160. Risselada, M. (1988). *Raumplan versus plan libre: Adolf Loos and Le Corbusier, 1919-1930*. p42. Bock, R. (2007). *Adolf Loos: works and projects*. p79. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p244. Gravagnuolo, B. (1988). *Adolf Loos: theory and works*. p201. Harbison, R. (2009). *Travels in the history of architecture*. pp221-222.

⁸¹⁹ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p57. Bock, R. (2007). *Adolf Loos: works and projects*. p80.

⁸²⁰ Tournikiotis, P. (1994). *Adolf Loos*. p98. Risselada, M. (1988). *Raumplan versus plan libre: Adolf Loos and Le Corbusier, 1919-1930*. p79. Bock, R. (2007). *Adolf Loos: works and projects*. p79. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p255. Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. pp29, 57. Schezen, R. (1996). *Adolf Loos: architecture 1903-1933*. pp21,78.

⁸²¹ Bock, R. (2007). *Adolf Loos: works and projects*. pp79, 82.

⁸²² Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. pp238, 244, 248, 250.

⁸²³ Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p29. Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p57. Schezen, R. (1996). *Adolf Loos: architecture 1903-1933*. p124. Munz, L. and G. Kunstler (1964). *Adolf Loos: pioneer of modern architecture*. p152. Harbison, R. (2009). *Travels in the history of architecture*. pp221-222.

⁸²⁴ Bock, R. (2007). *Adolf Loos: works and projects*. [inner cover] Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p123-125.

⁸²⁵ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. pp42-45. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. pp33-35. Lustenberger, K. (1994). *Adolf Loos*. p37. Tournikiotis, P. (1994). *Adolf Loos*. p63.

The consequence of Loos' design is that in the Muller House, ambiguity *rules in every* way. The interior is at once oddly disjunctive and exceptionally fluid, absolutely functional while sensuously luxuriant, restless and restful⁸²⁶. Scales shrink and enlarge, elements metamorphosise as their occupants use them in different ways, boundaries blur, space expands and contracts, materials ebb and flow, sightlines direct vision and elements block it, cladding is primary, structure is unreadable⁸²⁷. The centre of all this, the vertical circulation - the main stairway - enters the centre of the house asymmetrically, and introduces a rotational complexity that cannot be readily deciphered from drawings or photographs. There appears to be no structural grid as typically defines 'modern' space and by which we unconsciously read spaces, from which we derive order⁸²⁸. The house cannot be 'read' in normal terms⁸²⁹. The plan and the section – the conventional, accepted devices of architectural communication - are strangely unhelpful if turned to for clarification of the interior⁸³⁰. They serve only to further mislead the viewer, apparently disingenuously but nonetheless gleefully into a misconceived notion of understanding. Loos typically achieved his freedom from structural constraints by designing to a compact footprint, because of which he could create load bearing *exterior* walls. In this way his internal spatial manipulations could take place unhindered by structural considerations, and he was always able to begin and continue with, what for him was of the utmost importance, the mood and effect he wanted to achieve with his rooms, and their proportions and relationships, derived from their purposes⁸³¹. In this manner, as Kulka recorded, Loos could and would typically make numerous changes throughout construction; if not satisfied with a ceiling height, for example, he would ask for it to be changed without hesitation, no matter how awkward this may be to effect, or how much work need be re-done⁸³². But this malleability did not apply to the Villa Muller. With his final project, Loos had finally produced a design so complex that he did very little that altered it⁸³³.

⁸²⁶ Tournikiotis, P. (1994). *Adolf Loos*. p14.

⁸²⁷ Risselada, M. (1988). *Raumplan versus plan libre: Adolf Loos and Le Corbusier, 1919-1930*. p79. Bock, R. (2007). *Adolf Loos: works and projects*. p80.

⁸²⁸ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p17.

⁸²⁹ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p17.

⁸³⁰ Schezen, R. (1996). *Adolf Loos: architecture 1903-1933*. pp19, 21. Potie, P. (2008). Sophisticated Geometry in Baroque Composition. In Carpo, M. and Lemerle, F. [Ed.s]. *Perspective, projections and design technologies of architectural representation*. (p106). Turnbull, D. (2000). *Masons, tricksters and cartographers: comparative studies in the sociology of scientific and indigenous knowledge*. p55. Jeanneret, C-E. (2007). In Braham, W. W. and Hale, J. A. [Ed.s] *Rethinking technology: a reader in architectural theory*. p30.

⁸³¹ Risselada, M. (1988). *Raumplan versus plan libre: Adolf Loos and Le Corbusier, 1919-1930*. p79. Bock, R. (2007). *Adolf Loos: works and projects*. pp79-80, 84. Scott, G. (1999). *The architecture of humanism: a study in the history of taste*. p169. Harries, K. (2000). *The ethical function of architecture*. pp37-38. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. pp264-265.

⁸³² Tournikiotis, P. (1994). *Adolf Loos*. p36. Colamina, B. (1994). *Privacy and publicity: modern architecture as mass media*. p269 Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p31.

⁸³³ Kleinman, K. and Van Duzer, L. (1994). *Villa Muller: a work of Adolf Loos*. p31.

Figure 107: Plan, Villa Muller

Figure 108: Plan, Villa Muller

Figure 109: Plan, Villa Muller

Figure 110: Plan, Villa Muller

Plans for the Villa Muller, drawn up by Loos assistant, Karel Lhota. Building officials were frequently confused by the illegibility of Loos' schemes.

1.4.10 Regulation Rules - Mortification, Malcontent and The Death of Delight

From Vitruvian Orders to Corbusier's Five Points, 'principles' fill books and figure buildings, yet remain valid only for particular styles. Wherever they harden into code, statute, ordinance, or regulation, their mortar mortifies⁸³⁴.

The great problem in designing stairs is the strict rules laid down in the British building regulations⁸³⁵. Alan Blanc, architect.

Architects have responded to the increasing regulatory frameworks with a mixture of denial, boredom, resignation and fury – when in fact, the way forward is to work with rather than against the frameworks in a manner that is at the same time creative and realist⁸³⁶. Professor Jeremy Till, Dean of the School of Architecture and the Built Environment, University of Westminster

Architects, like tigers, are not reknowned for their amenability to instruction. Skirmishes between designers and planning officials (such as those Loos often found himself embroiled in) as to the merits or otherwise of some proposed scheme that frequently hinges upon differing interpretations as to the nature and importance of delight are by no means an unusual occurrence with regard to the achievement of architectural aims, either historically or currently⁸³⁷. In contemporary construction terms, it is readily evident that of the tenets of firmitas, utilitas and venustas – or firmness, commodity and *delight* as Vitruvius's triad was translated by Sir Henry Wotton, only the first two *need* be present in order for practical satisfaction to result. Once functionality, legality, ergonomics, safety, spatial allocations and budgetary constraints have been manipulated, mashed and mangled into some form of solution, however incoherent, aesthetically inelegant and / or physically / emotionally unsatisfying the result, sufficiency having been supplied, the job is frequently considered done. The delivery of delight - in all its varying forms – is not a requirement, but remains an optional extra so to speak, dependent upon the whim of those responsible for paying for it, and one which is frequently therefore deemed an unnecessary and unjustifiable expense⁸³⁸.

⁸³⁴ Hatton, B. (2006). The Problem of Our Walls. In Madge, J. and Peckham, A. (Ed[s].), *Narrating architecture: a retrospective anthology* (p173).

⁸³⁵ Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. p60.

⁸³⁶ Imrie, R. and Street, E. (2011). *Architectural design and regulation*. p14.

⁸³⁷ Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp122-123, 128. Imrie, R. and Street, E. (2011). *Architectural design and regulation*. p14.

⁸³⁸ Wotton, H. and Hard, F. (1968). *The elements of architecture*. p57. Hamilton, D. K. and Watkins, D. H. (2009). *Evidence based design for multiple building types*. pp20-21. Allen, E. (2005). *How buildings work: the natural order of architecture*. p161, 237-238. Quantrill, M. (1974). *Ritual and response in*

Unfortunately, of course, for architects, matters are not quite so conveniently simple. For architects, delight is neither optional nor an extra, it is fundamental – essential⁸³⁹. If a genuinely 'complete' resolution to any project is to be achieved, the apparently innate human desire to be delighted by beauty - in its multitude forms - must be considered and protected also⁸⁴⁰. Architects then, it would seem, are delight's caretakers⁸⁴¹.

But are architects delight's only caretakers? There must be other guardians also, surely? The layperson's assumption would likely be that building codes supposedly exist to do precisely that⁸⁴². But despite all good intentions, contemporary building codes and standards the world over are frequently not perceived by the architects required to adhere to them to be a moral force for good (a kind of superheroic architectural guardian designed to ensure the responsible delivery of environments and buildings that are pleasing, beneficial and harmless to us), but are far more usually associated, as the comments above suggest – with a pointlessly excessive level of bureaucratic restriction that appears to have been devised with the express intent of thwarting all designerly inclinations towards the use of imagination, ingenuity and creativity and which therefore achieves exactly the *opposite* of buildings that are pleasing, beneficial and helpful to us⁸⁴³. Building codes and regulations we would like to think, are supposed to protect us from the forces of constructional darkness (unscrupulous builders, unqualified designers, careless manufacturers, cavalier tradespersons and incompetent project managers) who care nothing for well-being and everything for

architecture. p110. Fisher, T. R. (2000). In the scheme of things: alternative thinking on the practice of architecture. pp27-28, 44. Kostof, S. (1977). *The architect: chapters in the history of the profession*. p142. Allsopp, B. (1974). *Towards a humane architecture*. pp13, 21-23. Kostof, S. (1995). *A history of architecture: settings and rituals*. p13. Losantos, A. (2006) *Stair design*. p4. Allen, E. (2005). *How buildings work: the natural order of architecture*. pp10, 237-238. Gelernter, M. (1995). *Sources of architectural form: a critical history of Western design theory*. p26.

⁸³⁹ Goldberger, P. (2009). *Why architecture matters*. ppix, 6-7, 8, 26, 39, 42. Till, J. (2009). *Architecture depends*. p182. Harries, K. (2000). *The ethical function of architecture*. pp12, 23-25, 119. Kostof, S. (1995). *A history of architecture: settings and rituals*. p12. Cook, P. (1967). *Architecture: action and plan*. p10. Malnar, J. M. and Vodvarka, F. (1992). *The interior dimension: a theoretical approach to enclosed space*. pp3, 9,11. Quantrill, M. (1974). *Ritual and response in architecture*. p102. Perez Gomez, A. (2006). *Built upon love: architectural longing after ethics and aesthetics*. pp4, 6, 8, 66. Allen, E. (2005). *How buildings work: the natural order of architecture*. p23. Allsop, B. (1974). *Towards a humane architecture*. pp8, 18-19, 76, 93. Fisher, T. R. (2000). In the scheme of things: alternative thinking on the practice of architecture. p1238. de Botton, A. (2006) *The architecture of happiness*. pp72-73, 173-174, 180,183. Coles, J. and House, N. (2007). *The fundamentals of interior architecture*. p64. Hagan, S. (2001). *Taking shape: a new contract between architecture and nature*. p11. Imrie, R. and Street, E. (2011). *Architectural design and regulation*. pp9, 14.

⁸⁴⁰ de Botton, A. (2006) *The architecture of happiness*. p212. Brolin, B. C. (1985). *Flight of fancy: the banishment and return of ornament*. p14. Cook, P. (1967). *Architecture: action and plan*. pp9, 10.

⁸⁴¹ Imrie, R. and Street, E. (2011). *Architectural design and regulation*. p8. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. p29.

⁸⁴² Cobin, J. (2001). *Building regulation, market alternatives, and allodial policy*. p9. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. pp122-124. Imrie, R. and Street, E. (2011). *Architectural design and regulation*. pp3, 5, 9, 23.

⁸⁴³ Imrie, R. and Street, E. (2011). *Architectural design and regulation*. pp7, 14, 20, 23. Yatt, B. D. (1998). *Cracking the codes: an architect's guide to building regulations [Hardcover]*. p11. Ben-Joseph, E. (2005). On Standards. In Ben-Joseph, E. and Szold, T.S. (Ed[s].), *Regulating place: standards and the shaping of urban America*. (pp1-2).

money - to guard us against the miseries that built mediocrity can inflict – accident, injury, illness, death and general unhappiness and malcontent - but the sad fact is that all too often *they do not*⁸⁴⁴. As noted previously, the misconception that building codes are founded upon an ‘architectural’ ethos of excellence is a common one⁸⁴⁵. Building codes are in fact almost inevitably based upon a far less noble premise – an unenthusiastically minimal level of achievement - one that although it might ensure *reasonable* firmness and usefulness, and therefore *reasonable* wellbeing, health, comfort, and safety, will not go so far out of its way as to *enhance* it by ensuring the provision of *delight*⁸⁴⁶. Building legislation is frequently regarded by architects therefore, as possessing more in common with the nature of a strangler vine than a superhero, owing to the (apparently ever increasing) multitude of exigencies that its bureaucracies encompass and which seem collectively designed to do nothing more than effect a slow but inexorable suffocation upon the creativity of any project to which it must inevitably become attached, thus (in tandem with financial constraints) perpetuating the delivery of a joyless succession of mediocre buildings from which all delight, innovation and daring has been effectively crushed⁸⁴⁷. (This depressing but all too frequent situation does not exist solely as a result of undelightful building codes of course, other factors are at work also including the architecture professions’ own widespread disinclination to engage with legislators, and its frequent and longstanding interpretation of ‘delight’ as a visual aesthetic only, rather than as applying to a more holistic state of being)⁸⁴⁸.

⁸⁴⁴ Scott, A. (2005). *Falls on stairways – literature review*. p10. Till, J. (2009). *Architecture depends*. p83. Yatt, B. D. (1998). *Cracking the codes: an architect’s guide to building regulations [Hardcover]*. p12. Cobin, J. (2001). *Building regulation, market alternatives, and allodial policy*. p9. D. K. and Watkins, D. H. (2009). *Evidence based design for multiple building types*. p19. van der Heijden, J. (2008). *Competitive enforcement: comparative analysis of Australian building regulatory enforcement regimes*. p104. Taylor, M. (2000). *Avoiding claims in building design: risk management in practice*. p36. Imrie, R. and Street, E. (2011). *Architectural design and regulation*. p23. Tszold, T. (2005). The Changing Regulatory Template. In: Ben-Joseph, E. and Szold, T.S. (Ed[s].), *Regulating place: standards and the shaping of urban America*. (p360).

⁸⁴⁵ See section 1.1.8 *Dangerous Spaces - Terrible Tales and High Crimes*. page 28
⁸⁴⁶ Scott, A. (2005). *Falls on stairways – literature review*. p10. Till, J. (2009). *Architecture depends*. pp180-182. de Botton, A. (2006) *The architecture of happiness*. p13. Hagan, S. (2001). *Taking shape: a new contract between architecture and nature*. p11. Yatt, B. D. (1998). *Cracking the codes: an architect’s guide to building regulations [Hardcover]*. p13. Ben-Joseph, E. (2005). On Standards. In: Ben-Joseph, E. and Szold, T.S. (Ed[s].), *Regulating place: standards and the shaping of urban America*. (p1). Imrie, R. and Street, E. (2011). *Architectural design and regulation*. p19.

⁸⁴⁷ Yatt, B. D. (1998). *Cracking the codes: an architect’s guide to building regulations [Hardcover]*. p11. Ben-Joseph, E. (2005). On Standards. In: Ben-Joseph, E. and Szold, T.S. (Ed[s].), *Regulating place: standards and the shaping of urban America*. (p3). Imrie, R. and Street, E. (2011). *Architectural design and regulation*. pp3-4, 7, 14, 19-20, 22-23. Van Doren, P. (2005). The Political Economy of Urban Design Standards. In: Ben-Joseph, E. and Szold, T.S. (Ed[s].), *Regulating place: standards and the shaping of urban America*. (p62).

⁸⁴⁸ Hamilton, D. K. and Watkins, D. H. (2009). *Evidence based design for multiple building types*. 25-26. Heath, T. (2010). *Learning architecture teaching architecture: a guide for the perplexed*. p29. Taylor, M. (2000). *Avoiding claims in building design: risk management in practice*. p39. Imrie, R. and Street, E. (2011). *Architectural design and regulation*. pp7, 9-10.

Efforts to enact legislation intended to improve the design and implementation of our buildings are on-going in many countries, but unfortunately, whilst social changes may occur with great rapidity and frequently do, construction, owing to the scale at which it must occur, the expense of its creation and the consequent expectations as to its life span, can be a slow affair, as therefore can the capability of legislative efforts to exert sometimes even modest improvement⁸⁴⁹.

Gloomy resentments against architectural mortification (whether genuine or perceived) aside, that the careful prescription of dimensions, form, materiality, and proportion required to ensure the functionality and safety of our stairs has eventuated and is legislatively attended to is just as well, one might think. Stairs are hazardous, risky things, especially for the very young, very old or any one of the many of us who experience disability in some way on a daily basis⁸⁵⁰. That they are restrained from unruly rebellion by their imprisonment within the irresistible petrification of layers of legislative code can only be a good thing? And in any case, all architecture, by its inherent nature, unlike sculpture or art, must before all else including delight, be useful - must first be – safely *usable*. Without such functionality there is little justification for it to exist, for which reason, according to both Vitruvius and Sir Henry Wotton, any construction that lacks it – no matter how delightful – assuredly cannot be termed architecture⁸⁵¹. Given this fundamental duty of use of architecture (in general) and the sheer number of legislative issues involved in producing a stair (in particular) that is functional, safe and comfortable, perhaps it is not so surprising that the challenge of introducing delight also, even for architects, is sometimes regarded as just one ask too many. It is a tricky business, this triad.

⁸⁴⁹ Farrelly, L. (2007). *The fundamentals of architecture*. p124.

⁸⁵⁰ McNoe, B., Langley, J., Driscoll, T. and Feyer, A. (2005) *Work-related slip, trip and fall injuries in New Zealand*. pp1-28. Kool, B., Ameratunga, S., Hazell, W. and Ng, A. (2010). *Unintentional falls at home among young and middle-aged New Zealanders resulting in hospital admission or death: context and characteristics*. pp1-2, 6. Scott, A. (2005). *Falls on stairways – literature review*. p10.

⁸⁵¹ Wotton, H. and Hard, F. (1968). *The elements of architecture*. p57.

1.1.15 Experimental Inhabitation: A Stair is a Stair is a?

For architects then, if despondent at an apparent, twenty-first century regulatory and commercial indifference to the human desire for delight, there is sometimes relief and joy to be found in the residential project. Projects intended for private inhabitation are often permitted greater regulatory leniency than those destined to serve commercial or public aims; the private home may permit both client and architect a little more freedom to indulge the desire for delight, including that to be found in the expression of individuality and the pleasure to be gained through curiosity in and experimentation with the new or the unusual, whether in terms of approach, end result or both⁸⁵². Here, despite the fluctuating fortunes and contradictory status of stairs in our tall commercial and apartment buildings, in our private houses - typically smaller buildings, where the distances to be traversed are smaller, less frequently, by less people - the stair has always been and continues to remain the easiest, most efficient and cost effective means of creating vertical access⁸⁵³. While the financial preoccupations of commercial buildings may anaesthetise any architect's enthusiasm for the stair by subjecting it to a paralysing dose of economic constraint, (apparent) regulatory excess, material meanness, spatial miserliness and general invisibility – in the home, a combination of design need, greater freedom and a creatively willing (and financially able) client can present an opportunity to extend the nature of the stair to great effect, as the examples included here show⁸⁵⁴.

In each of these projects, the stair, rather than being treated by its designer in usual fashion as subservient tool, transitive space and / or aesthetic object, has been permitted to become something more, to take on other roles also, with the result that our usual assumptions as to the nature of that role and how it should be fulfilled, are challenged, sometimes in quite startling ways. The surprise they engender forces us to confront our own expectations and assumptions as to not just what a stair should be, but how we currently inhabit space and how we could inhabit space – by provoking new thoughts and ideas as to what place *could* be, home *might* encompass, and what architecture is and can offer us.

In Japanese architect Sou Fujimoto's Final Wooden House, in Kumamoto, Japan, (See opposite page Figures 111-120), space has not been created by the use of conventional methods such as the construction of planar elements that demarcate space, and therefore designate place⁸⁵⁵. Instead, 350mm square cedar logs have been stacked to fabricate the house as an interlocking combination of space and mass. As the configuration of the logs varies, the proportions of the stepped forms they create vary also, which may expand their identity as step to become simultaneously, ledge, bench, table, chair, bed or platform, to accommodate not just feet but body also, and not just standing or walking, but lying, sitting, kneeling, sprawling and reclining⁸⁵⁶. Their variance in height also enables unusual, *vertical* changes in position and proximity to occur, in addition to those of the more usual horizontal, creating a very different sensation of spatial inhabitation than is typically possible. This ability to comfortably inhabit a range of different heights and positions within the house, provides its occupants with a rare degree of invitation, freedom and playfulness - to engage with their space in multiple ways and determine their own place within it according to their varying moods, needs and wishes – a flexibility that is both dynamic and vibrant yet simultaneously, acquiescent, comfortable and serene.

The same flexibility of space and freedom to inhabit is also evident in Sou Fujimoto's House H, in Tokyo, Japan (see page 102, Figures 121-122). The clients – husband and wife and their small daughter - presented the architect with an unconventional and paradoxical brief, requesting a range of rooms that were to be both clearly defined and simultaneously combined, creating a singular, continuous space that would therefore facilitate 'shared independence'⁸⁵⁷. Fujimoto achieved this by creating a series of volumes that are both defined and connected by changes in elevation, height, dimension, aperture, position and the use of steps, stairs and platforms. Changes in elevation and height, circumvented by the steps and stairs, denote thresholds between places even while each of those places belongs to and merges with those adjacent – both horizontally and vertically – to form a seamless whole. The house becomes a container of distinct yet related places, with changes in the inhabitants proximity made not just possible but continuously visible, allowing them to enjoy each other's presence, even when they may be occupying entirely different spaces.

⁸⁵² Imrie, R. and Street, E. (2011). *Architectural design and regulation*. pp212-213.

⁸⁵³ Baldon, C. and Melchior, I. (1989). *Steps and stairways*. p14. Templer, J. A. (1992). The staircase: history and theories. p167.

⁸⁵⁴ Blanc, A. and Blanc, S. (2001). *Stairs, second edition*. pp3, 115.

⁸⁵⁵ Sumner, Y. (2008). *Wooden den*. pp70-71.

⁸⁵⁶ Sokol, D. (2009). *A house that stacks up*. p38.

⁸⁵⁷ Gregory, R. (2010). *House H*. p62.

In THE FINAL WOODEN HOUSE '..... three-dimensional space is created out of 350mm increments.'

Figure 111: Final wooden house 1

'there are no categorization of floors, walls, and ceilings here. A locality that was thought as a floor transforms into chairs, ceilings, and walls from different perspectives. Floor levels are relative and people reinterpret the spatiality according to where they are. '

Figure 112: Final wooden house 2

Figure 113: Final wooden house 3

'people are three-dimensionally distributed in space and will experience new sensations of depths.'

Figure 114: Final wooden house 4

Figure 115: Final wooden house 5

Figure 116: Final wooden house 6

Figure 117: Final wooden house 7

Figure 118: Final wooden house 8

Figure 119: Final wooden house 9

Figure 120: Final wooden house 10

"Spaces are not divided but is rather produced as a chance occurrence within fusing elements. Inhabitants discover various functions within those undulations.'

Both as a constructional methodology and experiential space, this architecture is synthesized by the fusion of various differentiated elements. Here, conventional rules of architecture is nullified. There is neither a plan nor a stabilizing point.....

this bungalow is the wood itself that transcends the architectural convention to directly become a place for humans. It is of primordial existence before architecture. That is to say, rather than new architecture, it seeks new conception, a new existence'.

Sou Fujimoto Architects⁸⁵⁸

SOU FUJIMOTO: FINAL WOODEN HOUSE

Where and how shall I sit / lie / sprawl today?

⁸⁵⁸ http://www.worldarchitecturenews.com/index.php?fuseaction=wanappln.projectview&upload_id=10539

Figure 121: House H, Tokyo, Japan, 2009, by Sou Fujimoto Architects. The house is designed as a series of interlocking volumes that change in elevation and dimension throughout

Figure 122: House H by Sou Fujimoto. Changes in level and the placement of steps and stairs denote distinct 'places' within the interior, and both divide and connect

Figure 123: House tower, Tokyo, Japan, 2006, by Bow Wow Architects. The stairs delicacy and transparency conveys an immateriality that makes it difficult to distinguish between living and circulation space. Is there any difference?

Figure 124: House tower, bathroom. The small scale of the floor plates and their openness gives the impression that they are just another, albeit somewhat larger, set of steps. Stair and house merge.

Figure 125: Tattoo house, Melbourne, Australia, 2008, by Andrew Maynard. The integration of the stair with the kitchen worktop is a challenge to our assumption that feet and food do not mix and confuses and confounds our traditional notions of kitchen, place, circulation, stair, and space

'Flexibility is evident also in the House Tower by Bow Wow Architects. Here, the architects have created 65.28sqm of floor space in a 18.44sqm footprint, by designing a series of stair linked, stacked platforms. By removing all wall partitions from within the house, including those of the stair, the interior comprises a single volume rather than rooms, and connection, rather than division is emphasised. Each area does possess its own identity, derived through its combination of unique vertical position, proportions, furnishings and intended functions, so is its own 'place' but because the floor plates of the living areas are so small - essentially landings - and the stair that connects them appears quite delicate, the demarcation between stair as subservient circulation space and the landings as served, place is blurred. The stair, as the means by which the platform-places are connected becomes not merely transitive space, but continuous constant place in its own right, while the landings, revealed by the transparency of the stair, and absence of partitioning, simply appear to have become a stair at larger scale. Each, has in fact, while retaining its original nature, taken on something of the other's identity, to create a new and different sense of place altogether, one defined by relationships rather than boundaries, openness rather than enclosure and volume rather than surface.

Figure 126: Eva's bed by H2O architects. Using the stair, undefined space becomes inhabitable, multiple *places* at a child friendly scale. Changes in size, elevation and proportion offer the opportunity to imagine, create and inhabit multiple locations, to not just be in space but on, beneath and above it, to enjoy the freedom of multiple proximities that changes in level allow.

Figure 127: J-loft, Singapore, 2008, by Plystudio

Figure 128: Plus-Nyan house by Asahi Kasei Homes, Tokyo, Japan, 2008. Designed with both human and feline inhabitation in mind

Figure 129: Plus-Nyan house, corner stair to the catwalk

Connection was also emphasised by Andrew Maynard Architects in the Tattoo House, (see page 102, Figure 125), a project in which both a tight budget and restricted floor area inspired a teasing challenge to the typical use of the stair as secondary, servant, circulatory space. Here the stair's startling integration with the kitchen benchtop creates a defiantly assured and dominant presence, rather than one of indeterminacy or subservience, and forces its users to engage in an activity - standing on a kitchen work surface - that would normally be considered either absurd, dangerous, unhygienic or downright peculiar (or all of these). Here the stair is not servant but master, a reversal of roles that provokes uncertainty within us by challenging not just our expectations of and notions as to the stair but our ideas of space, and place altogether. This playful intermingling of functions reflects an ambiguity also evident in Eva's bed, by H2O architects. Here, a brief to divide a room saw the architects take the essential principals of the stair - elevation, scale and proportion - and manipulate them to encourage alternative and imaginative occupation, combining bed, table, seat, step, desk, platform, shelves, storage, couch, bench to create autonomous place that can be individually and / or simultaneously a range of possibilities; bedroom, house, playground, fort, retreat, living room and office according to its owners needs and wishes.

Figure 130: East village studio, New York City, Jordan Parnass Digital Architecture. A stairway to haven.

J-Loft in Singapore, by Plystudio, (see page 103, Figure 127) performs a similar function, but on a larger scale, and for adults. In response to the client's requests for a flexible, open plan interior, the architects demolished all the existing partitions in the six by twenty meter apartment to install a series of timber boxes that perform duty simultaneously or varying as furniture, circulation, storage, partition and architecture, as demands require. The inhabitants have been freed from the need to modify their behaviour to suit their environment and instead use their environment, including their stairs in multiple ways, for multiple purposes, to suit themselves. Both the feline and human inhabitants of Asahi Kasei's multi level Plus-Nyan house in Japan (page 103, Figures 128-129) can do likewise. Cats and humans are able to enjoy separate, parallel and shared lives much like the occupants of Sou Fujimoto's H house can enjoy their 'shared independence', by being able to simultaneously inhabit the same space but in different ways, by occupying differently positioned and scaled 'places' within it that take into account the needs of each - of humans for convenience and minimal exertion, and cats for elevated retreat and the capacity to observe. In an almost identical-in-principle but somewhat larger-in-practice example of the latter's habits, tailored to a human scale, the East Village Studio by Jordan Parnass Architects in New York includes an elevated niche and platform, carved from a larger space that enables its user to experience retreat and participation simultaneously. The use of a stair and therefore volume to connect niche and room, rather than a planar ladder, emphasises the relationship between the two, as well as their individual identities, by creating a very distinct, third space, that because one can inhabit - sit in it - as well as pass through it, becomes its own, definitive place.

In each of the examples seen here, the stair, rather than being treated in typical, superficial fashion as of either secondary importance or visual object-toy, has been examined and its essential nature as volumetric entity apprehended and explored - in very different ways - to create new and different modes of living. In Sou Fujimoto's projects, Final Wooden House and House H, and Atelier Bow-Wow's Tower House, the integration of the stair's essential nature as volumetric form has become integrated so completely into the house that the stair has become the house - or is it that the house has become the stair? Either way, each residence has become a curiously paradoxical combination of distinct yet related places in which inhabitants can simultaneously occupy the same space even while they are in different places. Conventional, usual boundaries have been removed and with them, the distinction between the stair as secondary, serving space and rooms as definitive, served space. The altered relationships enable inhabitants to relate to and interact differently with one another and to coexist in simultaneous, close and *conscious* proximity, but also autonomously,

independently. In Andrew Maynard's tattoo house, the stair has retained its connective nature and function but the manner in which this has been achieved, by integrating it with the space and functionality of the kitchen, is so atypical that its identity, and therefore that of the space it occupies has become completely altered, unrecognisable from what we would expect. It appears almost confrontational rather than servile; rather than enabling indifference to its presence it is demanding of inhabitation, its essence speaks of space becoming, being, unapologetically, unavoidably, occupiable place. Inhabitation is the expectation created by Eva's bed and J-Loft also, which both entwine the stepped mass and space of the stair at a range of scales to invite playful, imaginative use, becoming identifiable, inhabitable place, or rather *places*, as their owners needs change and they require different functions and personas of their environments - as furniture, architecture and stair. Cats and humans alike can enjoy the different spatial relationships and proximities that the stair and elevation permit in Asahi Kasei's Plus-Nyan house and Jordan Parnass's studio, maintaining connection while enjoying retreat, while the stair that facilitates this becomes occupiable place in its own right, rather than indeterminate space.

It is evident then, as even a brief examination shows, that opportunity to explore the stair and to discover different approaches to and uses of it that are beneficial and enjoyable are possible. So why do we not incorporate this opportunity more into our houses? Is this delight, this playfulness, but also this very practical flexibility, only for children and cats? Why must we relinquish it as adults? It is interesting to note that each of the projects here was driven at least somewhat by a constraint - that of limited horizontal space. In response, each architect has treated the enforced emphasis upon verticality not as a problem, but as an opportunity; each has used changes in vertical elevation to create different spatial configurations and therefore different experiences of proximity and perceptions of place than we typically experience when based upon the manipulation of horizontal space. In each, the removal of conventional, expected divisions and boundaries has blurred the line between place and space and changed the nature of its occupants relationships with their environments and each other. Here, the stair has transformed from mere space, to inhabited, inhabitable place.

1.5 Summary: Completely Curious – Be(A)ware of the Stair

Architects: all idiots. They always forget to put in the stairs.⁸⁵⁹

As noted at the beginning of this historical investigation, with all human affairs comprising a complicated collision and consequently conflicting tangle of multiple realities, wishful thoughts, disparate expectations, subjective perceptions, hopeful ideals and uncertain dreams - absolute clarity and understanding with regard to any aspect of human endeavour, and therefore of architecture, is an unlikely achievement. Fortunately, such an absolute aim was not the intent of this historical investigation into the stair. Instead, the aim was far more cautious, and hopefully as a consequence, realistic. It was hoped that by conducting an investigation into the historical development and use of the stair, some broad insights into our treatment of it would be revealed. It was anticipated that greater awareness and understanding of both our particularly contrary attitude towards the stair, and our treatment and use of it as an element of our built environment, would explain the reasons for its uniquely paradoxical nature, uncertain identity and indeterminate relationship, to and with, architecture. This would allow a different approach to the stair's treatment than those to which it has so far been subjected to be devised, that would see the stair considered as architecture – meaningful, inhabitable, enjoyable, place. So out of this cautious investigation what has emerged? A recap would seem in order.

Firstly, it would seem that the stair truly *is* unique in the realm of architecture. The poetic-pragmatic dichotomy which all human-made endeavours exhibit to some extent as a result of the perpetual vacillation and conflict between the need for the practical and the desire for the poetic, are very real, numerous and more evident with regards to the stair than any other aspect of architecture. This paradoxicality includes even the stair's origins. It originated *not* - like the roof and the wall - as a result of humanity's need for shelter, but as a tool, a technology. The stair's function is to connect. It originated from the need to circumvent height; to create, and access space – a function already fulfilled by the ladder but from which tool's disadvantages the stair evolved to create a gentler, safer, easier means of navigation. But it's *raison d'être* remains, like the ladder, the vertical inbetween, without which there is no need for it to exist, and for which reason we have fundamentally – no matter what culture or era in time – typically treated the stair as transitory space, rather than designated, inhabitable

place. This origination of the stair as servant space rather than served place and its continued designation as such has been reinforced by many notions with which all architecture struggles. Vitruvius, the author of the first known architectural treatise, observed the most fundamental of these with the devising and documentation of his troublesome triad, *Firmitas*, *Utilitas* and *Venustas*, and in so doing created an unhappy love-triangle and originated a tradition of separation between the poetic and pragmatic that western architecture has struggled to reconcile (and more often than not exacerbated), ever since. We particularly *expect* that these soothingly reassuring attributes will be applied to our stairs, which, by their shape, height and our own (multiple) weaknesses can be dreadfully deadly for us, more so than any other aspect of architecture (as our accident, injury and mortality statistics demonstrate) and for which reason predictability, constancy and precision in creating their form are welcome allies, but which, as with much of our building in general, we then we permit to be poorly designed - inconsistently dimensioned, ill-proportioned and inappropriately situated etc. - so contributing to our own collective (and literal) downfall. Expectations are powerful and frequently problematic things in general and in conjunction with the vagaries of our perceptions and reality are particularly so with regards to the stair if falsely held. The stair's (safe) navigation requires an exceptional level of physical and sensory engagement and awareness from us, which we expect to achieve with little conscious effort, but which we are then all too often unable to supply due to our own physical and sensory weaknesses (and which are then compound by the aforementioned tendency to permit poor design or construction). But for anyone experiencing a disability that prevents their easy and safe navigation (including unfortunate sufferers of bathmophobia and climacaphobia) and hoping therefore to avoid the stair, the ubiquity with which they pervade our built environment becomes all too quickly apparent, and their frequent presence can be an effective a barrier to access as the presence of a mountain range.

Speaking of which, stairs of course, are a package deal. Stairs exist due to the presence of height and the need to overcome it – and as has been seen, our relationship with height is an uneasy one. Naturally flightless and thus restricted to the ground plane, we long for the advantages of elevation - the opportunity to experience the different proximal and spatial experiences and relationships it affords us – but we are simultaneously condemned to constant wariness of it also, owing to a genetically hardwired awareness of the potentially terminal consequences of uncontrolled encounters with height - or more correctly - with the ground. Unable to escape the ties of the earth without technological assistance (either constructional or avaiatory), humans almost universally relinquished the unreachable heavens

⁸⁵⁹ Flaubert, G. and Barzun, J. [trans.]. (1954). *The dictionary of accepted ideas*. p15.

to the gods, and in emulation of its practical functionality of connecting places, appropriated and employed the stair both physically and symbolically to become sacred bridge and mediator on a slightly grander scale than just our realm – to bridge the divide between *worlds*. From these grandiose and monumental constructions and the subsequent reinforcement of the stair's symbolism we have appropriated both elevation and the act of ascension within our secular constructions also, to portray and convey our own aggrandisement (and conversely employed their opposites, the realm of depth and the act of descent), to suggest darkness, discord and disgrace). The paradoxes continue even for those of us less preoccupied with such divine and / or authoritarian inclinations but scale - ours as it turns out, in conjunction with age – is still a key issue. As agile children, the ability to successfully navigate a stair unaided to achieve elevation is a small victory of independence from which point (physically and metaphorically) we can enjoy the playful advantage of the stair's height, (and for which reason the designers of playgrounds frequently include changes in elevation in their schemes), but when aged and less agile we may come instead to fear the stair for the increased difficulty and risk its use poses for us. Less obviously, irrespective of age or reason however, at any point, a fear of height or stairs may expand and morph from an uneasy sensation of apprehensive uncertainty into a disabling spatial pathology of pure terror that prevents their navigation altogether, the consequences of which, the need to avoid the stair, is already the fate of millions of people worldwide who, experiencing disability for whatever reason and duration, are unable to negotiate a stair, and for whom therefore daily life, can be considerably more arduous.

Ironically, even those of us who are cheerfully free of such concerns give little thought to the other ways in which the stair affects our occupation of buildings. For the most part we give little conscious consideration to how and why our buildings originated and developed over time and still less as to whether their spatial composition is the most appropriate for our needs. As a result we do not notice the stair, and how its placement, scale, form and function may dictate our domestic interiors and prescribe our spatial relationships - and therefore our human relationships - however impractical the consequences may be and irrespective of whether such things could be better managed. In our homes, those of us who are able, could use and manipulate the stair's connective principle and form to create and accommodate different spatial configurations – configurations perhaps better suited to contemporary preferences for flexibility, connectivity and fluidity – configurations that would allow us to experience proximity differently and therefore our relationships and interactions with one another and with our architecture differently (as, in principle if not exactly for the same

reasons - did the castle-building nobles of the middle ages). Here, we could be playful, but not just in an aesthetic manner – by creating decoratively whimsical objects – as has typically been the stair's fate, (whether in three or two dimensions) but in creating the stair as space-as-architecture-as-place – liveable, inhabitable place. Why should cats, children, artists and mathematicians (*mathematicians for heaven's sakes?*) have all the fun? Could we not all use a little playfulness sometimes to remind ourselves that our buildings – and especially our stairs – are more than material practicalities, and that we – their inhabitants and users – can benefit from their being delightful and imaginative also?

So a unique and paradoxical creature indeed then the stair, as are we, its creators. It would seem that all our built elements are destined to share the same fate, the same peculiar schism and tension between the practical and poetic - how could they do otherwise when we ourselves are the most paradoxical of animals? - but it has been the stair's lot to become the most exceptional focus of this division. Human concepts of and notions as to such things as purpose, stability, order, constancy, functionality, permanence, elevation, spirituality, imagination, the poetic and the fantastic, are not concerns unique to the stair, they are issues of relevance to all our built constructions, in their entirety and individual parts, but we have enacted them in a unique manner and to an extreme extent with regards to the stair, for all the reasons above. Having identified and explored these on-going human concerns and their relevance to architecture generally and the stair specifically, it was important however to remember that our expectations, perceptions, needs and desires can and do vary according to changes in context, whether for social, cultural, technological, environmental, economic or political reasons. Thus having established firstly that the stair is essentially a paradoxical creature, and an extreme one at that – it was necessary to then specifically trace its historical development through Western European architecture, to examine particular moments in its history – when shifts and changes in *our* history – of taste, values, fashions, needs and desires - altered our attitude to and requirements, expectations and perceptions of the stair, and as a result of which our treatment of it changed accordingly.

From the chronological examination, it has become evident that the origins of much of the stair's treatment as primarily transitive space lie - neither unreasonably nor illogically - in its inherent purpose and obvious *raison d'être*: vertical transit. A stair *should* function as a transitive space, if it is to function as a stair – and if it cannot do this, there is not much point to its existence. Given that it may not even be necessary for it to exist at all, the stair's status within the hierarchy of architecture, is somewhat precarious in the first place. Countless buildings, all architectural considerations aside, have functioned quite happily without the

presence of stairs – albeit that this may have constrained their capability to extend verticality somewhat. Despite humble, practical origins in the realm of the profane however, the stair still became entwined with the beginning and development of monumental architecture in Mesopotamia, as the Sumerians incorporated the stair into their sacred constructions. The ziggurats and the stairs that enabled them combined the dual purposes of divine worship and astronomical study, a serenely equable marriage of poetry and pragmatism at a nonetheless epic scale that, it would seem, has not often been repeated as harmoniously since. The experiential value accorded the stair by the Mesopotamians, (and other great cultures such as the Aztecs and the Mayans) and its consequent careful treatment by them has been far more variable elsewhere however. In other cultures, whilst elevation may have been prized, the stair as a means of achieving it was not, and it's primarily transitive nature saw it largely dismissed. Such erratic treatment is reflected in The Curious Contradiction, the exemption of the stair by Vitruvius from the rule of Venustas. Vitruvius deemed the presence of Firmitas, Utilitas and Venustas to be essential for all works of architecture, if they were to be termed architecture, expect it would appear, with regards to the stair, which it would therefore seem was fated not to be such. The middle ages were subsequently responsible for the arrival of a new era for architecture in the form of the unprecedented and glorious soaring heights and luminous interiors of the gothic cathedral. These marvels were made possible by the increases in collective technical knowledge of the medieval masons, but the helical stair that assisted in their execution and continued presence remained marginalised, confined invisibly within the cathedrals impenetrable, implacable, masonry walls.

Even when living patterns began to change in the later Middle Ages and the usage and placement of the stair altered as a result, startlingly original creations such as the stair for King Francis the I at Blois, radical for its combination of exposed interior and outward vista, architectonic elegance and spatial harmony (and whether by Leonardo da Vinci or not) – even while it revealed new thought as to the experiential possibilities the stair could afford - was too expensive, too astonishing, too impractical and therefore too *irrelevant* to translate to wider favour. King Frances' stairs at Blois and his double helix of Chambord, remained isolated, exceptional novelties, no more than curiosities to most, and the stair continued for the most part to be both helical and hidden in the majority of European castle and fortress architecture. In similar vein, Michelangelo's solution to the practical problem of achieving access to the elevated Laurentian library saw him design a stair that appeared not only paradoxically, violently, mobile but which also in fact, appeared *barely contained* within the conflicted, chaotic outside-in world of the Ricetto. Such astonishing, sensational, sensory

and spatial dramatics were wildly at odds with Alberti's preferences of the same era with regard to the stair. To Alberti, eminent scholar-arbitrator of architectural issues of the era, the functional need for a stair, the same requirement that had inspired Michelangelo to architect a space–become-place of plastic, fantastic, bewildering but gloriously subversive exhilaration, was conversely, a problem to be managed, a trial for the disturbance that the stair's presence inflicted upon the harmonious management of the plan. If a stair must be present it should be made appropriately presentable, but its (multiple) nuisances required diligent tactical management and its vagaries were such a potential irritant that if they could be contained and prevented from causing disturbance, this was deemed architectural contribution enough. The *ideal* however, remained their complete absence.

We have seen though that despite this dismissal, as the Renaissance gathered momentum, new knowledge was sought and revealed, fashions emerged, values changed, new architectural concerns emerged and as a result of all these social shifts, attitudes toward the stair began to alter also. The evolution of the Baroque garden with its greater scale and emphasis upon movement, vista, journey, sensation and engagement both required and invited a more active contribution from the stair than it had previously been either offered or investigated as being capable of, but which was now used to stage and direct a magnificent theatre and processional journey of changing views, enclosures, elevations and dramatic set pieces. Andrea Palladio applied the experiential potentials of the exterior stair to create a sense of approach to his houses, emphasising their grandeur and status, and documented his appreciation or such inventions as the double helix stair at Chambord at some length in his *Quattro Libri*, activities that would suggest the stair's presence – as opposed to its absence was becoming more desirable. But Palladio, like Alberti, remained wary of welcoming the stairs obvious presence into his interiors, and for much the same reasons. Even while, in *Quattro Libri*, documenting the successful execution of his own and others' helical stairs, in his Venetian domestic Villas Palladio continued to confine his interior stairs to discreet enclosures, rooms, wells and corners, and wrote urgently warning against the unruly havoc and dreadful disorder their heedless management could cause to the symmetrical serenity to the household. Despite the advance of the stair from the garden to the house then, within the interior its presence, as in Alberti's time, remained problematic. It was only the evolution of the theory of magnificence and the relocation of the principle rooms from the ground floor to the Piano Nobile – begun originally for practical reasons in Venice but quickly, widely fashionable elsewhere – that influenced the adoption and use of the stair as connective device between the exterior entranceway and the first floor reception rooms, thus releasing

it from the confines of the courtyard (in Venice) and the street (in Florence). The need to address the issue of how best to manage the connection coincided with the emerging societal love of theatre and drama to which designers, along with Alberti's documented studies on perspective and the examples of the great garden stair, turned to for lessons in the management of theatre, illusion and performance. The enthusiasm with which these lessons were applied and the greater material freedom that the protected interior could provide, eventually caused so much attention to be lavished upon the stair that its presence frequently became the dominant factor of the building. In a context of such enthusiastic excess and with the stair now an entity so complicated in both form and symbolism - expected to simultaneously perform duty as plaything, status symbol, artistic fancy, sculptural object, political statement and general instrument of splendour – the only surprising aspect of Sir Henry Wotton's observation as to the stair being curious is that someone else had not previously labelled it such, and more vehemently.

It is also unsurprising, with the benefit of our historical hindsight, that such excessive, extravagant, *exhausting* enthusiasm for the Baroque stair with all the era's attendant emphasis upon formal drama and rigid symmetry was unsustainable on a permanent basis. This enthusiasm eventually waned in favour in continental Europe of the more light-hearted, whimsical frivolities of the rococo and in England for the more tranquil serenity of the neo classical and Palladianism. Even the Rococo lost its charms eventually however and in the subsequent climate of the enlightenment and scientific rationalism the stair became the subject of scientific enquiry also, in particular that of Jean-Francois Blondel. For Blondel the stair's functional locating was, as it had been for Alberti and Palladio, a problem requiring careful study, for the impact that its careless situating could have upon the household, but for the first time also, the stair was studied from an ergonomic perspective to ensure its users greater comfort and safety. Blondel's later compatriot and Gothic maverick Viollet-le-duc was less interested in ergonomics however and more concerned at the inordinate amount of space the stair continued to consume, owing to the lingering fascination for Baroque scale, symmetry and proportion that had remained (as encouraged by classicists such as Blondel) even while the excessively decorative inclinations of the era had not. But Viollet-le-Duc's desire to return to the spatial economies and sensibilities of the helical stair was not his only mavericity. He was unusual in both this *and* his preference for the newly mass producible materials of cast iron and plate glass that saw the rise of both such constructions as Joseph Paxton's Crystal Palace in London's Hyde Park, and the professional responsible – the engineer – to the wider dismay of the majority of the architectural 'establishment' of the time, aghast

at the apparently wilful undermining of centuries of architectural tradition. For the stair, the most significant aspect of the collective development of the new materials, construction techniques and technology occurred in America, where the combined ready availability of the safety elevator, steel, concrete and labour meant that architects and engineers, now able to design and construct tall buildings did so with great alacrity. The unprecedented height of the new buildings emphasised an increasing problem however, as it became apparent that whilst the presence of an elevator might enable easy access, egress in event of emergency was a different matter entirely. Here then, rather than the stair's *presence* being a problem, as in Alberti's time, it was its removal and *absence* that had become the issue. Even when its presence was subsequently ensured however, in the form of the fire escape, the stair's return caused aggravation, this time for the greed with which its presence consumed and therefore reduced interior, lettable - expensive - floor area. In most tall commercial buildings today therefore we have seen the stair become an unenthusiastically supported affair; a secondary, standby circulatory system and an unprofitable irritant to be produced and implemented to as minimal an expense as possible.

This commodification of space and building, born in the frenzy of the English industrial revolution, has in general seen profit replace pleasure and efficiency, delight, in our commercial and public buildings – the struggle to combine both the poetic and pragmatic equably seems for the most part, too great an ask, or at least too great an ask financially. Our homes are frequently the only small spaces that we may call our own, if we do in fact own them, and even then we frequently possess little freedom (money) to shape them to suit our desires (it is a sadly likely possibility that they more usually shape us, and in not particularly beneficial ways). Where design is possible, architects typically rely upon the longstanding tradition of the architectural plan to create a scheme, even though, as we have seen, in the case of Councillor Krespel, the reliance upon a two dimensional process to conceive, design and communicate the end, three dimensional intent, is neither necessarily the most logical or successful approach, even while it may be the easiest, most convenient and least expensive. The startled response of Krespel's audience to this use of an experiential, sensory (especially haptic) process to create an interior environment of great comfort at the expense of concern for exterior appearance in E.T.A Hoffman's *Councillor Krespel*, highlighted how entrenched this tradition is, and its consequence, which is perhaps that we are and have been for too long, rather more concerned with what our buildings might look like than how well they could and should also fulfil our needs for delight, in the sense of providing comfort, ease and practicality. Architecture however, is a profession with a tradition of being fond of tradition - as Adolf Loos,

we have seen, discovered - and far less fond of deviations from its cherished tenets. Yet Loos created interiors for his clients' homes that were exceptionally comfortable and comforting places by employing an approach that like Krespel, eschewed drawing in favour of the haptic and the three dimensional to design *with*, to think *in* volume, rather than within the two dimensional - and false - confines and constraints of the paper plan. Loos would imagine his designs in space from which he would then create interrelationships that forged place, by considering height and elevation before width and length, and relationships and proximities before separation and division. The scalar, proportional and elevation ambiguities of Loos houses, with their multiple, shifting vistas and blurring of servant-served spatial boundaries reply upon the stair in both its conventional form and Loos extraction of the stair's essential nature as volumetric, spatial entity, to create an unconventional but thoroughly logical principle for spatial design, and from which Loos created configurations that were both elegantly flexible and easily, livably, enjoyable.

Such environments, that use the inherent three dimensionality of the stair to accomplish a different manipulation of space and achieve altered spatial configurations and relationships that permit and encourage the capability for alternative modes of occupation, need not be the exception. As the examples in section 1.4.11 *Experimental Inhabitation* demonstrate, there are architects and clients willing to take a risk, to challenge the inherent purpose of the stair as transitive space, to alter the manner in which it is implemented and the reasons why; to see what else it may become and what in turn, it may allow us to be, and how. These projects are all domestic in nature, their privacy offering the advantage of greater freedom from the building restrictions that surround the stair of public and commercial buildings and their smaller scale a more affordable opportunity to implement and test ideas. But as our homes are also the places to which we typically retreat and spend a great deal of our time, from which we desire comfort and the luxury of our individuality, and which may be our only opportunity to be and feel truly individual, it makes sense therefore that these are the spaces with which such unusual experiments take place. It is notable that there are particularly many examples in Japanese residential architecture where the stair's treatment has diverged from the norm, where the boundary between designated, served place and circulatory, servant space, and the public and the private has become blurred. Japanese residential dwelling patterns have differed markedly from those in Europe, due to, among other reasons, different notions as to privacy and family. Japanese houses also frequently occupy smaller footprints than those of Europe, and where their occupants desire more space, have no option therefore but to grow up, requiring the use of the stair to do so.

Because of their smaller floor area and often, larger number of inhabitants however, clever use of space is required in order to maximise efficiency and comfort. The stair's function then is frequently not - cannot be - restricted to merely serving as vertical transitive space, but must work harder to serve other functions also, such as seating, storage, play and partitioning, or is such that it is integrated so entirely with the house or specific spaces that no distinction between circulation space and dwelling place is possible, the two have become one and the same. Here, in such examples, the pleasure and possibility of the stair as inhabitable, inhabited place become apparent.

Through undertaking the historical investigation however, by tracing our development and use of the stair over time in relation to changes in context in Western European architecture, it has been revealed that such examples, that apprehend the stair as capable of being place, and explore and develop its identity as such - have not been and are still not usual. The investigation has confirmed the original premise that since its pragmatic origins as tool, transitive space and literally, means to an end, if architecture is interpreted as the endeavour of creating inhabitable, meaningful place, the stair has not historically been considered by architects to be architecture, and is very rarely considered to be so now. The investigation has demonstrated instead that throughout the stair's history, architects or those responsible for architecting constructions, have, and still generally treat the stair in one of two ways; as either a problematic necessity - a disruptive influence to be managed but otherwise afforded as little attention as possible - or as a fanciful toy, readily malleable to serve the purposes of either decorative (albeit usable) ornament or symbolic representation. Which approach the stair has received has typically been dependent upon its context - including its intended uses, users and location - which has thus consequently determined its status as either primary or secondary means of access and circulation. The consequences of both approaches are the same however, both are superficial and isolating, and irrespective of eventual end use, serve to disconnect the stair from any wider context. In immediate, built terms, this typically means that the stair and the space it occupies become disjuncted from the larger entity of which it is a part, the building. As transitive space it can be either given less meaningful thought than those spaces that have been deliberately designated to be place, and regarded superficially, from either an aesthetic or functional perspective only. Both states can often be found with regard to the same building.

In less immediate but perhaps even more significant terms however, either treatment isolates and disconnects the stair from the context and consideration of the wider concerns of architecture; how we live, how we would like to live, what our architecture could allow us to be and to become, and how this could be achieved. Removed from such a context, there is no requirement to reflect on and explore the stair as anything other than fantastic-fiction or subordinate servant, and the stair's nature and contribution to architecture is typically reduced to that of being either an image or a problem, and if the latter, to an indifferent (and hidden) functionality. Either existence removes any recognition of the need to continually consider and question the stair in the same way as any aspect of our buildings – thoughtfully - from the perspective of architecture as the making of place. And with both approaches the opportunity to enhance our lives is relinquished. Without consideration of the stair, not only can we not challenge our expectations of it what it could be, what it could contribute to architecture, and therefore, how that architecture could help us, we lose also the opportunity for discovery, and the pleasure and reward that curiosity can bring, in experiencing surprise at discovering and evolving new ideas and possibilities that make our lives easier, more enjoyable, more delightful, even if only in very small ways. Perhaps our problem is not as Flaubert claimed that architects are all idiots - we always forget about the stairs - perhaps our problem is rather that we have never really thought about them in the first place – in the sense of pausing to consider that they might be capable of being any more than the transitive servants for which purpose we originally created them, or the symbol-toy-ornament for which purposes we have appropriated them. But in the continued absence of awareness, curiosity cannot exist – it remains unprovoked, and the stair, unnoticed in its indeterminacy, is denied both a role as a physical architecture of place, and any inclusion in discussion as to what place and architecture may be.

How then can we include the stair within these broader architectural concerns? How can we begin to think of it as potential place? The examples of architects such as Adolf Loos, Sou Fujimoto and Atelier Bow-Wow who have deliberately done so, demonstrate that the stair is capable of being such, that it can in fact combine both functions of transitive space and destination-place – to be both and simultaneously – and that our stairs therefore, are as deserving of meaningful attention as any other aspect of our architecture. It is notable however that whilst each of the contemporary projects included in the investigation has treated the stair in very different ways, to achieve different ends, that all have succeed in creating an architecture of place from that which would typically, be regarded as merely transitive space, by demonstrating certain key characteristics:

The stair as place:

The first and perhaps the most important of these is that while the examples demonstrate that it is indeed perfectly possible for the stair to be place, crucially, they also demonstrate that owing to a combination of open minded client and creative architect it was allowed and intended to be such. Each of the projects is inhabitable because they treat the stair – thought of it - as being capable of inhabitation. Rather simply then, If we wish for the stair to be place we have to think of it as place, to intentionally explore it with this aim in mind, so a change of thought is required.

The stair as volume:

The second common characteristic is that all the projects demonstrate a change in focus, from a conventional architectural preoccupation with surface, (as the mechanism used to divide and therefore create space), to a more unusual emphasis upon volume, as the means of creating and connecting space. The focus is not then the creation of a primarily visual architecture-as-object (derived from the plane), but has shifted direction to the broader concern of creating spatial experience, sensation and relationships, from volume. This greater emphasis upon volume, the sensory and the three dimensional requires greater attention from architects with regard to understanding proximity and relationships and greater awareness from the occupants of themselves; of their own bodies, their level of engagement with the places that they inhabit, and their relationships with and to each other. Our architecture creates spatial relationships and patterns and thus prescribes our actions, activities and human relationships, and each of the projects has enabled unconventional spatial relationships and therefore different human relationships to occur and be experienced by their occupants.

The stair as opportunity:

The third characteristic is that the projects are all notable because whilst all are subject (as most projects are) to enforced constraints – in these particular cases these being due to limited area, volume available and / or increased occupants numbers – they are all characterised by an essential playfulness. All appear to welcome the constraints as opportunities - to *enjoy* the challenge of circumventing them - in clever, surprising, imaginative and often multiple ways.

This change in attitude enables inhabitants to enjoy an environment of surprise, which in turn provokes intrigue and question – *curiosity* in fact- *how* did they do that? – and *delight* - in the pleasure of encountering the unexpected and becoming aware of different possibilities.

The stair as experience:

This perception of the stair as opportunity is linked in turn to a fourth characteristic, that of using the stair – both in its conventional form, and by understanding its essential nature and agencies – as the means by which the delight – the surprise - is achieved. Each project generates and offers spatial experiences and possibilities, relationships and sensations that could not occur without the stair – its presence is fundamental – essential - to the experience of the space and enjoyment of it. Pleasure is derived from the revealing of that which is different and unexpected - the opportunity to experience, inhabit, see and think of the stair in new ways - as both capable of inhabitation – of being place - and capable of affording delight. The stair is transformed from a nuisance or a problem, to become an experience, an environment of pleasure. And a *particular* pleasure of each project is that each provokes question not just as to a stair might be, but what a house and home might be, by subverting the conventional relationship between the building and the stair and requiring its occupants to consciously recognise this as part of their experience of and relationship with their home.

The stair as uncomplicated:

Finally, all the projects are characterised by a recognition that although the stair might be complicated – to design, construct and implement - it, and our architecture in general, should not actually be complicated to occupy. The stair and architecture might require that designers deal with complex spatial configurations, constraints and demands, but the essential nature of the stair and all our architecture, is that it should enhance our lives, that we should be able to live more easily because of it – we should be able, like the occupants of the contemporary projects – to live in a way that fulfils our needs, for both the practical and poetic.

All of the characteristics identified above are the result of changes in thought, focus, attitude, expectation and priority that have made it possible for architects to explore the stair from the perspective of habitable space and demonstrate therefore that the stair is capable of being meaningful *place*. But these examples are few, and as the designer John Christopher Jones is at pains to note

design research in the sense of confronting ‘what is’, does not tell us all we need in deciding how to shape the new.... ‘test it’ is perhaps the best design method there is.⁸⁶⁰

Having established ‘what is’ therefore – that the stair can be place - and some understanding of the means by which other architects have achieved this, the next thing to do then is test these approaches. The next part of the thesis will now use the second methodology, research by design, to explore and test the idea of the stair as place.

⁸⁶⁰ Jones, J. C. (1992). *Design methods: second edition*. pxxxi.

PART 2: RESEARCH BY DESIGN: EXPERIMENTAL INHABITATION

PART 2: RESEARCH BY DESIGN: EXPERIMENTAL INHABITATION

2.1 The Research Proposition

Design research considers the processes of shaping and making of places⁸⁶¹.

Through use of the second methodology, that of research by design, a series of experiments will be devised through which the characteristics previously identified will now be investigated. The aim of the experiments is to explore and test the notion that the stair, if apprehended from the position of architecture as inhabitable place, can be place. It is anticipated that the experiments, even if unsuccessful in this sense, will generate a discussion as to the architectural identity of the stair and its potential to contribute to an experiential, inhabitable, architecture of meaning, 'the process of shaping and making place' This section of the thesis will document the process by which the design experiments were carried out, the findings of the research process, discuss their significance and note directions for future research.

2.2 Devising a Process

Methodology should not be a fixed track to a fixed destination, but a conversation about everything that could be made to happen. The language of the conversation must bridge the logical gap between past and future, but in doing so it should not limit the variety of possible futures that are discussed nor should it force the choice of a future that is unfree⁸⁶².

To carry out the experiments, it was necessary to devise a process. In order to have a conversation about that stair that would not repeat previous tendencies to both over complicate and superficialise it, it was determined that its potential to be place should be investigated using a very simple process. The process should be flexible enough that it was not deterministic – 'a fixed track to a fixed destination' that would constrain the stair's exploration from a new perspective as place, but it should also be sufficiently structured that a meaningful, rather than aimless, conversation could be achieved, and the results assessed. With this in mind, a series of questions was devised based on the characteristics identified previously, so that the experiments would be logically founded on and could be tested against existing precedents, and against which the results could be examined, but which at the same time did not place undue restrictions on the direction that they may take.

⁸⁶¹ American Institute of Architects. <http://www.aia.org/practicing/research/index.htm>

⁸⁶² Jones, J. C. (1992). *Design methods: second edition*. pxxxi.

PROPOSITION 1: A CHANGE OF THOUGHT - THE STAIR AS PLACE

Architecture can make its main contribution by creating conditions that support a different experience, a different way of life, and perhaps even a different way of thinking about the nature of our expectations⁸⁶³.

How can we think of the stair as inhabitable place?

The stair's primary purpose is to enable the creation and connection of vertical spaces, from which we make places.

But what happens if we remove the stair's primary purpose?

How do we do that?

The stair normally exists to serve a building. If we remove that building we remove the stair's primary purpose and free it from a role as transitive space - in practical terms we are removing its context. With its primary, obligating purpose removed, there is no need to consider the conventions that enable functional requirements in a typical manner. It is possible instead to identify the stair's form, attributes and affordances to explore them, determine the stair's essential nature, and see what is possible and what it might become.

PROPOSITION 2: A CHANGE OF FOCUS - THE STAIR AS VOLUME

The staircase belongs to space⁸⁶⁴.

The enjoyment of the plan and section as an aesthetic experience is virtually restricted to architects and deeply rewarding but risks self-indulgence⁸⁶⁵.

How can we focus upon exploring the stair as volume, rather than surface?

Architects frequently begin designing by using the plan and exterior surfaces to create architecture as an object.

What if we don't begin with the plan?

How else do we begin?

Like Loos, we can reverse the process. Rather than beginning with the plan, we can begin with exploring a mood, an emotion, a sensation that could be created – by investigating – as Krespel did also - the sensation of the space, how it might feel - not just its appearance. And also like Loos and Krespel, having removed the building exterior as the focus of attention, to focus upon a 'meaningful centre' we can focus on the stair, and work from the stair outwards with the connection of volumes, rather than beginning as is usual with the building exterior, and working inwards, with a focus upon division of space by using the plane.

⁸⁶³ Vesely, D. (2006). *Architecture in the age of divided representation: the question of creativity in the shadow of production*. p25.

⁸⁶⁴ Ponti, G. (1960). *In praise of architecture*. p118.

⁸⁶⁵ Platt, C. (2005). *The inhabited perimeter and the inclusive room*. pp201-202.

PROPOSITION 3: A CHANGE IN ATTITUDE - THE STAIR AS OPPORTUNITY

it is only through the exercise of imaginative vision that one can see the potential for change in what otherwise might appear restrictive⁸⁶⁶.

How can we use the stair to be playful, to engage us with our homes and create delight?

Stairs are typically consistent; we require predictability and constancy of them and effect legislation to try and ensure that this is the case.

What happens if we alter that?

How can we we explore and manipulate the stair and challenge its conventionality, to create surprise and intrigue?

The physical components of the stair may be simple, comprising as noted previously, treads, risers and something to hold them together, but the attributes of each can be manipulated singly and collectively to an infinite succession of variations, in which even an apparently minor difference can offer a change in mood and provoke delight at encountering the unexpected. Conventional – expected - treatments of proportion, scale, colour, texture, shape, opacity, weight, mass, density and materiality can be altered to create sensations that encompass not just sight but sound, touch and smell and provoke delight at encountering the unexpected.

⁸⁶⁶ Till, J. (2009). *Architecture depends*. p194.

PROPOSITION 4: A CHANGE IN EXPECTATION - THE STAIR AS EXPERIENCE

the profession needs to shift the application of architectural attention from objects to agency⁸⁶⁷.

How can we emphasise the spatial experience of the stair rather than its aesthetic appearance?

The volumes created by the stair's conventional form are typically dismissed as inconvenient for habitational needs. What happens if we accept that the volumes created by the stair are different and make use of this?

What can the stair afford us that we can make use of to do this?

The stair does not just afford the practical function of vertical transit. Stairs offer us a different way of moving through and experiencing space. Different actions are required of the body to negotiate vertical space, to ascend or descend; a higher level of engagement and awareness is necessary and different sensations result. Different spatial relationships are possible, as changes in height and elevation permit altered experiences of proximity, connection, privacy and separation and changing vistas and proprioceptive experiences. Elevation, height, levels and volume must be considered differently because we move through, experience and interact with spaces delineated by these means, differently. [

⁸⁶⁷ Till, J. (2009). *Architecture depends*. p167.

PROPOSITION 5: A CHANGE IN PRIORITY - THE STAIR AS UNCOMPLICATED

look for essences, not for superficial stylistic detail⁸⁶⁸.

How can we use the stair to make our lives easier?

We lead complicated, often stressful lives.

How can we use the stair to create architecture of comfort and ease, without excessive complexity?

We frequently lead complicated lives. However, our stairs and our architecture may be complex, but they do not have to be complicated also. Ideally they should make our lives easier. We complicate our architecture however by frequently emphasising its visual appearance and ability to communicate messages, rather than by considering how it can help us live. While the capability to communicate is one of the delights of architecture, we frequently load our buildings with so many symbolic connotations, desires, fantasies, dreams, wishful thoughts and ideals, many of which are considered superficially only and therefore lack genuine, relevant meaning, that we forget that how they make us feel is important too. *Have we forgotten that architecture should enable us to create places that help us to live, that fulfil our needs? Is this the essence of architecture?*

These questions and tentative answers provide a simple theoretical basis for exploring the stair that is logical enough to enable the results to be tested and assessed against existing precedents but sufficiently experimental to allow possibilities to eventuate that otherwise may not occur. Removal of the stair from a context enables its form and attributes to be explored without the need to consider conventional functionality. Without a building to serve, the stair can be explored as the generator and focus of volume, sensation and mood. With an emphasis on sensation an investigation of the opportunity for greater engagement and delight can occur. Consideration of affordances such as movement, proximity and relationships can unfold. A different means of thinking of inhabitation – living - whether for the purposes of dwelling, working or playing may be revealed.

⁸⁶⁸ Goldberger, P. (2009). Why architecture matters. pxvii.

2.3 The Process Outline

In accordance with this basis, a very simple process was devised.

STEP 1. MODEL EXPERIMENT: PAPER STAIRS

Create paper models of stairs

Photograph the models

Observe the qualities that emerge in the photographs as a result of contrast between light and shadow, planes and volumes, changes of materiality, colour proximity, scale, proportion and viewpoint.

STEP 2. MODEL EXPERIMENT: MANIPULATION

Manipulate the stair images in Photoshop by using techniques such as duplication, superpositioning, adding and subtracting layers, manipulating colour, hue, tone and filters, and transforming; stretch, shrink, rotate and skew.

Document the process by recording each change

Observe the qualities that eventuate from these changes in scale, proportion, lighting, colour and layering

STEP 3. STAIR EXPERIMENT: MANIPULATION

Photograph existing stairs

Apply step 2 to the images

Additionally, integrate with the paper model images

STEP 4. STAIR EXPERIMENT: MANIPULATION OF SCALE

Manipulate the images with regard to scale and proportion in particular

Document the process by recording each change

Observe the qualities that emerge with regard to changes in size and proportion; volumes, detail, relationships, proximity, connection and disconnection

2.4 The Process: Step by Step

The next section of the thesis documents the application of the process. For ease of reading, only one example of the process in its entirety has been included here. The processes and results of two more experiments have been appended at the end of the document; see Appendix 1. Research by Design: Experiments Series 2 and Appendix 2. Research by Design: Experiments Series 3

STEP 1. MODEL EXPERIMENT: PAPER STAIRS

materials: drafting paper, card, cartridge paper, acetate,
 tools: pencil, ruler, scalpel, cutting mat, lamp, camera
 process: draw score cut fold photograph

observe: form scale proportion light / shadow material planes / volumes opacity / translucence

STEP 2. MODEL EXPERIMENT: MANIPULATION

tools: pc, photoshop

process: duplicate overlay layer add subtract colour filter ... stretch shrink rotate scale

observe: qualities that eventuate from these changes in scale and proportion and form

potentials light, dark, shadow, glare, positive, negative, obvious subtle, material, planes, volumes, opaque

..... skew

city, translucency

Step 2. Model Experiment: Manipulation Continued

light / dark
opacity, light
positive / negative,
obvious / subtle ...
planes /volumes,
material / immaterial

Step 2. Model Experiment: Manipulation Continued

Step 2. Model Experiment: Manipulation Continued

Step 2. Model Experiment: Manipulation Continued

SERIES 1 STEP 3. STAIR EXPERIMENT: MANIPULATION

Photograph existing stairs

Manipulate the stair images in Photoshop by using techniques such duplication, superpositioning, adding and subtracting layers, manipulate colour, hue, tone and filters, stretch, shrink, rotate and skew. Integrate with the paper model images

Document the process by recording each change

Observe the qualities that eventuate from these changes in scale, proportion, lighting, colour and layering

Step 3. Stair Experiment: Manipulation

STEP 4. STAIR EXPERIMENT: MANIPULATION :: SCALE

Manipulate the images with regard to scale and proportion in particular :: Document the process by recording each change :: Observe the qu

qualities that emerge with regard to changes in size and proportion; volumes, detail, relationships, proximity, connection and disconnection

Step 4. Stair Experiment: Manipulation :: Scale Continued

Step 4. Stair Experiment: Manipulation :: Scale Continued

Step 4. Stair Experiment: Manipulation :: Scale Continued

Step 4. Stair Experiment: Manipulation :: Scale Continued

STEP 4. STAIR EXPERIMENT: MANIPULATION :: SCALE :: MOOD

STEP 4. STAIR EXPERIMENT: MANIPULATION :: SCALE :: MOOD

SERIES 2: SUMMARY

SEE APPENDIX 1. PAGE 187 FOR SERIES 2 PROCESS DOCUMENTATION

SERIES 2: STEP 4. STAIR EXPERIMENT: MANIPULATION :: SCALE

See Appendix 1. Page 187 for Series 2 process documentation

See Appendix 1. Page 187 for Series 2 process

SERIES 2:

STEP 4. STAIR EXPERIMENT: MANIPULATION :: SCALE :: MOVEMENT

See Appendix 1. Page 187 for Series 2 process documentation

SERIES 3: SUMMARY

SEE APPENDIX 2. PAGE 239 FOR SERIES 3 PROCESS DOCUMENTATION

SERIES 3:

STEP 4. STAIR EXPERIMENT: MANIPULATION :: SCALE

See Appendix 2. Page 239 for Series 3 process documentation

SERIES 3:

STEP 4. STAIR EXPERIMENT: MANIPULATION :: SCALE :: PROXIMITY

See Appendix 2. Page 239 for Series 3 process documentation

2.5.1 FINDINGS

The aim of the experiments was to explore, apprehend and test the stair from the position of architecture as inhabitable place, to determine if it was capable of being such and if so, establish a means by which this might be achieved. A simple theoretical basis was devised against which the stair could be investigated and an equally simple process was designed to carry out the investigation. This process was documented in the previous section, **2.4 A Series of Steps**. The results support the example of the contemporary case studies examined in section **1.4.11 Experimental Inhabitation: A Stair is a Stair is a ?** which demonstrated that the stair can in fact be architecture – where architecture is understood to be the making of place from space.

The experiments demonstrate that by developing an awareness of conventional design approaches and practices and correspondingly identifying those that might be considered a little more unconventional and applying the thought processes behind them, it is possible to challenge conventional modes of thinking, notions, perceptions and expectations as to not just the role of the stair but the broader nature of architecture, and the process of design and research. As explorations of the stair from the perspective of habitable place rather than transitive space, the experiments demonstrate that the stair has more to offer us in terms of architecture – of place-making - than we have previously paused to think of it as being capable of or given it credit for.

2.6 DISCUSSION

2.6.1 A Brief Recap

Section **2.4, A Series of Steps**, documented the design experiments conducted with the aim of exploring, apprehending and testing the stair from the position of architecture as habitable place. The contemporary case studies examined previously had demonstrated that it was possible for the stair to be such, and had enabled certain characteristics common to the projects to be identified. These characteristics were the result of changes in thought, focus, attitude, expectation and priority that made it possible for the projects' architects to explore the stair from the perspective of habitable space. From these key characteristics a series of simple questions and tentative answers were identified from which a set of propositions was drawn. These propositions established a simple theoretical basis for exploring the stair that have enabled the results to be viewed and assessed against the existing examples provided by the case studies, but which were sufficiently flexible enough to allow other possibilities to emerge.

The propositions argued that removal of the stair from its typical context i.e. a in regards to a building would enable its form and attributes to be explored without the need to consider conventional functionality. Without a building to serve, the stair could be explored as the generator and focus of volume, sensation and mood. With an emphasis on sensation an investigation of the opportunity for greater engagement and delight could occur and greater attention could be given to consideration of accordances such as movement, proximity and relationships. It was hoped that a different understanding of the stair and its potential as habitable place could be achieved.

While theoretically simple however, the testing of the very first proposition alone - the removal of the stair from its context - created some practical issues. The possibility of and opportunity to remove an existing staircase from an actual building (or preferably several) was considered somewhat unlikely and even if possible, unduly complicated. And lone staircases, minus an accompanying building or without attachment to or integration with some aspect of an existing context are uncommon. Alternatively, one to one scale construction, although considered, was deemed both too time consuming and expensive to achieve (especially repeatedly) within the available time frame and budget, and in addition raised the concern that as an exploratory, investigative process, owing to the time and effort involved, such a

method runs the risk of removing the emphasis from *exploration* and becoming instead, a too-definitive pathway to a 'fixed destination', an end in itself, rather than a means to one. With these issues in mind, it was necessary to devise a very simple process by which means the propositions – especially with regard to the separation of the stair from any context - could still be effectively tested but which could be achieved in a manner that was rapid, simple, easy, cost effective and replicable, and which balanced the need for a thoughtful approach with the need for freedom to explore. The process subsequently devised accommodated all these requirements and comprised 4 steps

Step 1. create paper models of stairs, photograph the models, observe the qualities that emerge in the images as a result of contrast between light and shadow, planes and volumes, changes of materiality, colour proximity, scale, proportion and viewpoint.

Step 2. manipulate the images in Photoshop by using techniques such duplication, superpositioning, adding and subtracting layers, adjusting colour, hue, tone and filters, applying transformations, stretch, shrink, rotate and skew, and observing the qualities that eventuated from these changes in scale, proportion, lighting, colour and layering.

Step 3. photograph existing stairs and apply step 2, manipulating the images in Photoshop as above, and observing the results.

Step 4. Select images from step 3 and apply further manipulations with regard to scale and proportion in particular to observe the qualities that emerge with regard to changes in size and proportion and their influence upon volumes, detail, relationships, proximity, connection and disconnection.

2.6.2 The Process and Results - A Review.

The process was, it is readily acknowledged, very simple; unsophisticated even. But in terms of enabling the testing of the propositions and the documenting and evaluation of the test results, it proved to be surprisingly easy and effective, as the following evaluation, performed against the original propositions, demonstrates.

PROPOSITION 1: A CHANGE OF THOUGHT - THE STAIR AS PLACE

Beginning the research by constructing paper models of stairs proved to be a very simple and effective means of removing the stair from its context. With the need to reference typical considerations and constraints of context (including uses, users, site, placement, and corresponding functional requirements) removed, it was possible to focus instead solely upon exploring and observing the stair – in terms of its essential nature, form, attributes, affordances and possibilities. Use of the paper models was also advantageous because they were very quick and easy to create, thereby ensuring that all time and attention could be directed to the purpose of the experiments - consideration of the stair - rather than the complexities of model construction. Photographing the models was a simple and effective means of documenting the investigation process. It enabled easy review and comparison of the qualities revealed by the models. The spatial and sensory qualities generated by the exploration of the stair and recorded in the images demonstrated that by deliberately focussing consideration upon the stair rather than its context, it was possible to identify qualities of the stair that could be tested to explore its experiential potential and contribute to the development of the stair as place; form, geometry, space, light and shadow, and the influence of materiality, colour, scale and proportion.

Step 1. Model Experiments: Paper Stairs

PROPOSITION 2: A CHANGE OF FOCUS - THE STAIR AS VOLUME

The paper models *were* quick and easy to create, and provided a more inherently accurate reflection and therefore a greater awareness and understanding of the stair's essential, volumetric nature than perspective sketching would have allowed for but manipulation of the consequent photographs in Photoshop provided an even faster means of testing this and the inherent spatial and sensory qualities of the stair, by enabling the rapid generation of multiple iterations, across a wider range of variables. Using techniques such as duplication, superpositioning, adding and subtracting of layers, manipulating colour, hue, tone and filters and by applying transformations - stretch, shrink, rotate and skew - it was possible to create multiple, rapid, successive changes in contrast, colour, brightness, texture, depth, scale and proportion. By saving an image every time a change was made, it was possible to easily document and observe the impact of the changes and to trace and review the process by which different spatial qualities - and therefore changes in mood, emotion and sensation emerged. Although conducted in the 2d medium of the computer screen, the ability to create multiple layers within images enabled the awareness of and focus upon the volumetric nature and corresponding spatial qualities of the stair to be maintained.

Step 2. Model Experiments: Manipulation

PROPOSITION 3: A CHANGE IN ATTITUDE - THE STAIR AS OPPORTUNITY

Having established some awareness and understanding of the stair's inherent qualities, its volumetric nature and potential to create mood and sensation, it was necessary to apply the same process of photographing / image manipulation to some actual stairs, to determine if these same qualities could be replicated – using the same process - in the built environment, and so test the stair's potential to provide delight and engagement. To add an additional challenge to the test the process was applied to what are typically regarded as very undelightful examples of stairs – fire escapes. Such stairs are generally little used and thus usually receive the most pragmatic, unplayful treatment possible and as a result frequently epitomise the most undelightful state of the stair, one devoid of enjoyable sensory or experiential qualities. In addition, whilst all our stairs are typically consistent and predictable to ensure their safe use, it is particularly imperative that stairs intended for emergency egress are such. It was of particular interest therefore to explore such stairs and manipulate them in such a way as to subvert their conventionality, so as to create surprise and intrigue, and transform them into place, even while retaining their practical functionality. Several examples of fire escape stairs were photographed therefore, and the process of Photoshop manipulation was applied to these images also.

Step 3. Stair Experiments: Initial photographs

The stairs were cut out from their contexts and by using the same techniques of duplication, superpositioning, adding and subtracting layers, adjusting colour, hue, tone and filters and applying transformations - stretch, shrink, rotate and skew – the generation of different spatial qualities, moods and sensations was explored. Conventional – expected - treatments of proportion, scale, colour, texture, shape, opacity, weight, mass, density and materiality were examined, altered and tested in an attempt to explore opportunities to create the unexpected from the usually ignored, and therefore, surprise and delight.

Step 3. Stair Experiment: Manipulation

PROPOSITION 4: A CHANGE IN EXPECTATION - THE STAIR AS EXPERIENCE

For the stair to enable and support experience and inhabitation, particular attention must be paid to considering notions of scale and proportion. It was anticipated that by investigating these aspects of the stairs nature, greater understanding of the potential spatial and sensory experiences, proximities and relationships the stair offers would be achieved and a means of introducing this determined. By applying further transformations - stretch, shrink, rotate and skew – to images that had already been manipulated, and further examining the impact of additional changes in proportions, and scale It was hoped that issues of particular relevance to the stair - movement, elevation, depth, volume, proximity and relationships could be explored and insights gained into not just the stair and what it might be, but the idea of what architecture might be and how we could engage with it, especially that of our homes.

Step 4. Stair Experiment: Manipulation :: Scale

PROPOSITION 5: A CHANGE IN PRIORITY - THE STAIR AS UNCOMPLICATED

It was suggested previously that although the stair might be complicated to design, construct and implement, it, and our architecture in general, should not actually be complicated to occupy. The experiments and process behind them would seem to suggest that the stair need not be complicated to contemplate and explore either, and that our tendency to over-complicate its nature, especially with regard to its aesthetic treatment and use as symbolic device, is more a matter of habit than a indication of thoughtful, genuine consideration, an approach which requires a change of thought, focus, attitude and perception.

Whilst some of the experiments were more successful than others in creating the suggestion of habitable place from both the conventional and essential natures of the stair, the process itself as well as the results achieved was an interesting and useful reminder that it is not always necessary to use complicated methods or theoretical premises when investigating architectural issues, and that sometimes quite simple processes and questions are sufficient to support different ways of thinking about and exploring architecture, and obtaining new answers. It is also acknowledged however that whilst the experiments support the evidence provided by the contemporary case studies – that it is possible for the stair to be habitable place - and the research process documented in this thesis provides a means of achieving this, it is by no means suggested that these are in any way definitive or final solutions, or that the process might be the only way of achieving this. The process thus far has provided a simple but effective means of initiating an investigation into the stair as habitable place and demonstrated that it is capable of being such, but it has also raised further questions. The experiments for example were only applied to one particular type of stair – the external fire escape and it would be interesting to apply the process to other types of stair, of different materiality, tectonics, form, scale and proportion to see if different qualities might emerge. And there remains the question as to how the process might now be applied to an actual design project brief, which in turn raises as such questions as to how might the context of a project site impact upon the capacity of the stair to become the focus of the project? Would it still be possible to design for example, a residence (or any other building for that matter) based around the essential nature, the spatial and sensory qualities of the stair and its affordances, and retain those qualities and the characteristics explored here from concept to execution - would the project be successful or not, as enjoyable by its inhabitants? This is the frustration and delight of research, that one question always raises more, but these will have to wait for another project, it is now time to conclude this one, by asking again, ***What is architecture made of?***

The Stair as Place :: Mood, Feeling and Emotion :: Delight

The Stair as Place :: Movement, Space and Sensation :: Delight

The Stair as Place :: Volume, Elevation and Proximity :: Delight

2.8 CONCLUSION

CURIOUS ARCHITECTURE:

felines, stairs and human affairs, what *is* Architecture made of?

Architecture, it has transpired, may mean many different things to many different people, but most, if asked, would probably not suggest that it was made of cats. And possibly only a few more might suggest that it was made of stairs. And we might even wonder sometimes, given the indifferent unkindness of much of our built environment, if it was made of human affairs. But if architecture is not made of these things – felines, stairs and human affairs, what is it made of?

This thesis began with an unusual proposition. It was argued that if architecture is that which offers us the ability to inhabit space and create *place* via the deliberate instigation of spatial, sensory, physical, emotional, spiritual and intellectual experience that engages us and communicates meaning, then architects do not currently and have not considered the stair historically, to be architecture. The aim of this thesis was to challenge this situation and demonstrate that that the stair, when examined from the perspective of habitable place, rather than just transitive space, is capable of being an architecture of place and of offering us opportunities for meaningful habitation.

This was achieved through the use of two methods, the first being a historical investigation and analysis. By tracing our development and use of the stair over time in relation to changes in context in Western European architecture, it was possible to confirm the original proposition that since its pragmatic origins as tool, transitive space and literally, means to an end, if architecture is interpreted as the endeavour of creating inhabitable, meaningful place, the stair has not historically been considered by architects to be architecture, and remains very rarely considered to be so now. The investigation revealed that instead, throughout the stair's history, architects or those responsible for architecting constructions, have, and still generally treat the stair in one of two ways; as either a problematic necessity - a disruptive influence to be managed but otherwise afforded as little attention as possible – or as a fanciful toy, readily malleable to serve the purposes of either decorative (albeit usable) ornament or symbolic representation. Which approach the stair has received has typically

been dependent upon its context – including its intended uses, users and location - which has thus consequently determined its status as either primary or secondary means of access and circulation. The consequences of both approaches are the same however; both are superficial and isolating, and irrespective of eventual end use, serve to disconnect the stair from any wider context. In immediate, built terms, this typically means that the stair and the space it occupies become disjuncted from the larger entity of which it is a part, the building. As transitive space it can be given less meaningful thought than those spaces that have been deliberately designated to be place, and regarded – or rather, *disregarded*, superficially.

Less immediately but perhaps even more significantly however, either treatment isolates and disconnects the stair from the context and consideration of the wider concerns of architecture; how we live, how we would *like* to live, what our architecture could allow us to be and to become, and how this could be achieved. Removed from such a context, there is no requirement to reflect on and explore the stair as anything other than fictioneered fantasy or prosaic servant, and the stair's nature and contribution to architecture is typically reduced to that of being either an image or an problem, and if the latter, to an indifferent (and hidden) functionality. Either existence removes any recognition of the need to continually consider and question the stair in the same way as any aspect of our buildings – thoughtfully - from the perspective of architecture as the making of place. And both approaches mean the opportunity to enhance our lives is relinquished. Without consideration of the stair and its indeterminacy, not only can we not challenge our expectations of it what it could be and what it could offer us an architecture of place, we lose also the opportunity for discovery, and the pleasure and reward that curiosity can bring, in experiencing surprise at discovering, evolving and discussing new ideas and possibilities that make our lives easier, more enjoyable, more delightful, even if only in very small ways.

In an effort to consider how this situation might be challenged, how we could begin to think of the stair as potential place, and include it within a consideration of broader architectural concerns, the historical investigation investigated some examples of modern and contemporary architects who have done exactly this. Architects such as Adolf Loos, Sou Fujimoto and Atelier Bow-Wow have demonstrated that the stair is capable of being more than the transitive servant for which purpose we originally created it, or the symbol-toy-ornament for which purposes we have since appropriated it. Their projects demonstrate that the stair can in fact combine both functions of transitive space and destination-place – to be both and simultaneously – and that our stairs therefore, are as deserving of *meaningful* attention as any other aspect of our architecture. It became apparent from examining the

projects that whilst each architect has treated the stair in very different ways, to achieve different ends, all succeed in creating the stair as architecture – an architecture of place – by sharing certain key characteristics in their approaches, the foremost of these being that each apprehended the stair of being capable of inhabitation – each *thought of it as place*. All also focussed upon the volumetric nature of the stair and the connection and flexibility of space, rather than its division and containment. Each appeared to demonstrate an attitude in which a constraint was regarded as an opportunity, a chance to be responsive, creative and playful, to create delight - rather than as a problem to be overcome. In conjunction with this, all appeared to regard the stair's unique affordances – for elevation, movement, different sensations, relationships and proximities as being inherent and available potentials to create experience. And finally, all the projects were characterised by a great sense of comfort, of being *comforting* to their inhabitants, for the ease with which they permitted their owners to live their lives in the ways that they wished. All of these projects were the result of changes in thought, focus, attitude, expectation and priority that made it possible for their architects to explore the stair from the perspective of habitable space and demonstrate that the stair is capable of being meaningful *place*.

Having identified modes by which it appeared that the stair could be explored as place, the second methodology, research by design attempted to investigate these by conducting a series of design experiments. The aim of the experiments was to explore and test the notion that the stair, if apprehended from the position of architecture as inhabitable place, could be place. A set of simple questions and tentative answers based upon the characteristics previously identified, was established from which a set of propositions was derived. These propositions established a simple theoretical basis for exploring the stair and enabled the results to be assessed against existing precedents, but were sufficiently flexible enough to allow unsuspected possibilities to emerge. By removing consideration of the stair from its typical context - a building – it was possible to explore its form and attributes without the need to consider conventional functionality and to focus upon the stair as generator and focus of volume, sensation and mood. With an emphasis on sensation, an investigation of the opportunity for greater engagement and delight was possible and greater attention could be given to consideration of affordances such as movement, proximity and relationships.

The experiments and process behind them demonstrated that the stair – *and the stair as place* - need not be complicated to contemplate and explore, and there is no need to over-complicate its nature as we tend to do, especially with regard to its aesthetic treatment and use as symbolic device. Whilst the experiments varied in the degree to which the end results

created the suggestion of habitable place from both the conventional and essential natures of the stair, the process itself as well as the results achieved was, in itself, a useful reminder that sometimes quite simple processes and theoretical premises can provide just as an effective means of investigating architectural issues as other more complex approaches, and are just as able to support different ways of thinking about, questioning and exploring architecture and developing new ideas as to what it may be and offer us. Not that it is suggested that the investigation ends here, that the exploration is complete and all the answers have been found. This *has* been an investigation of the stair, and its curiously paradoxical nature, and it *has* been demonstrated that that the stair can be habitable place – that architecture, where architecture is the making of place, can indeed be *made of stairs* – but it has also demonstrated that human affairs are – should be – the making of architecture also, where architecture helps us live our lives by fulfilling our needs for both the pragmatic and the poetic, whereby the pragmatic can *become* the poetic. And that perhaps, by being both more like Wotton and cats in our affairs - by seeing the curious in the apparently incurious, there is opportunity for delight to be found.

So what is *curious* architecture made of?

felines, stairs and human affairs – that's *what architecture's made of*.

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REFERENCE LIST

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Figure 2: Mossemnear, B. Lincoln Cathedral. http://lookaboo.com/o/pictures/picture/1485680/The_Norman_West_Front_of_Lincoln_Cathedral.html Last accessed 21 August 2011.	3
Figure 3: Takahashi Kogyo Company Ltd. (2005). Bicycle shed. http://www.takahashikogyo.com/sakuhin/umehara/umehara_e.htm Last accessed 21 August 2011.	3
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Figure 22: Public Domain. Israel Ludlow and his Ludlow Aeroplane. http://www.wright-brothers.org/History_Wing/Aviations_Attic/UFOs/UFOs.htm Last accessed 15 June 2011.	31
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Figure 45: Unknown Author. (2006). Great Ziggurat at Ur. http://commons.wikimedia.org/wiki/File:Ziggurat_of_Ur_001.jpg Last accessed 02 September 2011.	49
Figure 46: Schedel, H. (undated). View of Strasbourg, France, c.1490, woodcut from the folio of Hartmann Schedel. http://en.wikipedia.org/wiki/File:Strasbourg1493.png Last accessed 21 June 2011.	51
Figure 47: Slots, E. (2011). Chartres Cathedral. http://www.worldheritagesite.org/sites/chartres.html Last accessed 21 June 2011.	51
Figure 48: Geoffrion, J. K. J. (undated). Chartres west tower helical stair. http://www.jillgeoffrion.com/chartrescathinfo.html Last accessed 21 June 2011.	52
Figure 49: Viollet-le-Duc, E. (undated). Plan, Chartres Cathedral. http://fr.wikisource.org/wiki/Dictionnaire_raisonn%C3%A9_de_l'architecture_fran%C3%A7aise_du_Xle_au_XVle_si%C3%A8cle Last accessed 21 June 2011.	52
Figure 50: Tower from the portfolio of Villard-de-Honnecourt. http://sk.wikipedia.org/wiki/S%C3%BAbor:Villard_de_Honnecourt_-_Sketchbook_-_12.jpg Last accessed 05 June 2011.	54
Figure 51: Section documenting flying buttress from the portfolio of Villard-de-Honnecourt. http://www.encore-editions.com/system-of-buttresses-at-the-reims-cathedral Last accessed 05 June 2011.	54
Figure 52: The lion and the porcupine from the portfolio of Villard-de-Honnecourt. http://www.myartprints.com/a/de-honnecourt-villard/ms-fr-19093-fol24v-lion-a.html Last accessed 05 June 2011.	54
Figure 53: Chateau Royal de Blois. (undated). The stair at Blois. http://www.chateaublois.fr/?Gallery-of-photos&lang=en Last accessed 05 June 2011.	55
Figure 54: Unknown Author. (2006).The double helix stair at Chambord for King Francis I. http://fr.wikipedia.org/wiki/Fichier:Escalier_Chambord.jpg Last accessed 05 June 2011.	55
Figure 55: Bryn Mawr College, PA, USA. The plan of the Ricetto for the Laurentian library. http://www.brynmawr.edu/Acads/Cities/wld/04310/04310m.html Last accessed 17 August 2011.	57
Figure 56: Unknown Author. (undated).The Ricetto - an entrance with no room for an entrance. http://aranarch.blogspot.com/2010_04_01_archive.html Last accessed 17 August 2011.	57
Figure 57: Unknown Author. (undated).Classical conformity gives way to chaos. http://www.museumsinflorence.com/foto/biblioteca%20lauren/image/scale1.jpg Last accessed 17 August 2011.	58
Figure 58: Unknown Author. (undated).Chaos from on high. http://aranarch.blogspot.com/2010_04_01_archive.html Last accessed 17 August 2011.	58
Figure 59: Unknown Author. (undated). Varying vagaries. http://aranarch.blogspot.com/2010_04_01_archive.html Last accessed 17 August 2011.	58
Figure 60: Unknown Author. (undated).The Laurentian library. http://www.museumsinflorence.com/foto/biblioteca%20lauren/image/lib.jpg Last accessed 17 August 2011.	59
Figure 61: Tomasini, F. (undated). Plan of the Botanical Garden at the University of Padua. Last accessed 14 August 2011.	61
Figure 62: Public Domain. (undated). The garden of the Chateaux Vaux-le-Vicomte, 1657-1661, by Andre le Notre. http://en.wikipedia.org/wiki/Vaux-le-Vicomte Last accessed 14 August 2011.	61
Figure 63: Benedetti, M. (undated). Dragon fountain and stair, Villa d'Este, Italy. http://www.villadestetivoli.info/gall_04_e.htm Last accessed 03 August 2011.	62
Figure 64: Blanc, A. and Blanc, S. (2001). Stairs, second edition. Grand Stair, Villa Garzoni. p76. Last accessed 05 June 2011.	62
Figure 65: Benedetti, M. (undated). View from the head of the stairs at the organ terrace, Villa d'Este, Italy. http://www.villadestetivoli.info/gall_02_e.htm Last accessed 05 June 2011.	62
Figure 66: Sticksles, A. (undated).Grand Stair, Villa Farnese, Caprarola. http://www.greatbuildings.com/cgi-bin/gbi.cgi/Villa_Farnese.html/cid_3017778.gbi Last accessed 03 August 2011.	62
Figure 67: Slots, E. (2011). The grand stair, Villa d'Este, Italy. http://www.worldheritagesite.org/sites/villadeste.html Last accessed 05 June 2011.	62
Figure 68: Lima, J. (2010). Palladio's oval stair for the monastery of Santa Maria della Carita, 1561 Last accessed 03 August 2011.	64
Figure 69: Cooper, T.E. (2005). Palladio's Venice: architecture and society in a Renaissance Republic. p93. The stair at Carita from above. Last accessed 03 August 2011.	64
Figure 70: Author unknown. (2006). Villa Godi, 1537-1542, Andrea Palladio. http://en.wikipedia.org/wiki/File:Palladio_Villa_Godi_photo.jpg Last accessed 04 August 2011.	65
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Figure 72: Author unknown. (2006). Villa Cornaro, Andrea Palladio. http://www.windoweb.it/guida/arte/biografia_andrea_palladio_5.htm Last accessed 04 August 2011.	65
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Figure 74: Palladio, A. (undated). Plan, Villa Capra (La Rotonda). http://en.wikipedia.org/wiki/File:PalladioRotondaPlan.jpg Last accessed 04 August 2011.	66
Figure 75: Palladio, A. (undated). Plan, Villa Chiericati. http://en.wikipedia.org/wiki/File:Villa_Chiericati_plan.jpg Last accessed 04 August 2011.	66
Figure 76: Palladio, A. (undated). Plan, Villa Cornaro. http://en.wikipedia.org/wiki/File:VillaCornaro_2007_07_14_front_1.jpg Last accessed 04 August 2011.	66
Figure 77: Descouens, D. (2011). The Ca'd'Oro (the Palazzo Santa Sofia), 1428-1430. http://en.wikipedia.org/wiki/File:Ca%27_d%27Oro_facciata.jpg Last accessed 06 August 2011.	68
Figure 78: The ceiling of the Church of Sant 'Ignazio, Rome, 1691-94, by Andrea Pozzo. In Kubovy, M. (2003). The psychology of Perspective and Renaissance Art. Last accessed 25 August 2011.	69
Figure 79: Majanlahti, A. (2006).Painted dome, the Church of Sant 'Ignazio, Rome, 1685, by Andrea Pozzo. http://en.wikipedia.org/wiki/File:Sant%27Ignazio_-_painted_dome_-_antmoose.jpg Last accessed 25 August 2011.	69
Figure 80: McClung, W. (2009). Reggia di Portici, Naples, Italy., Frescoes, 1750, by Vincenzo Re. Last accessed 05 June 2011.	69
Figure 81: Italian palace portico with stair and fountain, by Giuseppe Galli. http://www.artnet.com/artists/lotdetailpage.aspx?lot_id=C20874F0C3076A3B Last accessed 05 June 2011.	70
Figure 82: Stage set featuring grand stair by Giuseppe Galli Bibiena. http://www.all-art.org/history294-5.html Last accessed 05 June 2011.	70
Figure 83: Public Domain. (2008). The Scalone Palazzo Madama Torina, Turin, Italy, by Filippo Juvarra. http://en.wikipedia.org/wiki/File:ScalonePalazzoMadamaTorino.JPG Last accessed 05 June 2011.	71
Figure 84: Author unknown. (2007). The royal staircase of the Reggia di Caserta, 1752-1780. By Luigi Vanvitelli (1700-1773). http://en.wikipedia.org/wiki/File:Scala_Reggia_Casertana.jpg Last accessed 05 June 2011.	79
Figure 85: Carroll, A. (undated). Grand stair of the Palazzo Farnese, Caprarole, ca 1584, by Giacomo Barozzi da Vignola. http://surfacefragments.blogspot.com/2010/05/palazzo-farnese.html Last accessed 05 June 2011.	72
Figure 86: Author unknown. (undated). Palazzo Farnese, the open newel of the grand stair. http://loremipsum10.blogspot.com/2010/08/villa-fornese-italy.html 05 June 2011.	72
Figure 87: Berger Foundation. (undated). Palazzo Farnese, the elaborate ceiling of the stair. http://www.bergerfoundation.ch/Jardin/vignola_english.html 05 June 2011.	72

Figure 88: Dupont, B. (undated). Palace of Versailles, the Salon des Porcelaines. http://www.visualphotos.com/image/2x2332666/palace_of_versailles_-_salon_des_porcelaines Last accessed 18 June 2011.	75
Figure 89: Author unknown. (undated). The grand stair at the Bishops Palace in Wurzburg by Balthasar Neumann. http://blickwinkelley.blogspot.com/2011/02/baroque-city-of-wurzburg.html Last accessed 05 June 2011.	75
Figure 90: Author unknown. (undated). The grand stair at the Bishops Palace. http://myhomepage.ferris.edu/~norcrosa/KCAH112web/Images/RococotoRomanticism/2stair2.jpg 05 June 2011.	75
Figure 91: Author unknown. (undated). Staircase of the Balbi Family's Palace at No. 5, Via Balbi, Genoa, Italy. http://commons.wikimedia.org/wiki/File:Anderson,_James_(1813-1877)_-_Genova_-_L%27Universit%C3%A0.jpg Last accessed 20 August June 2011.	76
Figure 92: The crystal palace at Hyde Park, 1851. In Bird, A. (1976). Paxton's palace. p119.	84
Figure 93: The crystal palace interior. In McKean, J. (1994). Crystal palace: Joseph Paxton and Charles Fox. p31.	84
Figure 94: The crystal palace interior, including stair. In McKean, J. (1994). Crystal palace: Joseph Paxton and Charles Fox. p16.	84
Figure 95: Crystal palace, stair detail. In Bird, A. (1976). Paxton's palace. p91. Last accessed 04 May 2011.	84
Figure 96: Ironwork balusters by William Kinman, to a design by Robert Adam, 1774. In de Botton, A. (2006) The architecture of happiness. p212.	85
Figure 97: The Trustees of Sir John Soane's Museum. (undated). Sir John Soane's Museum, London, iron balustrade on the staircase, 1808-09. http://www.soane.org/media_centre/images_of_the_museum Last accessed 04 June 2011.	85
Figure 98: Marriott Group. (2011). St. Pancras Renaissance London hotel: grand staircase. http://www.marriott.com/hotels/photo-tours.mi?marshaCode=lonpr&pageID=HWHOM&imageID=10 Last accessed 10 June 2011.	86
Figure 99: Bradley, S. (2007). St Pancras Station. p110.	86
Figure 100: CIBSE Heritage Group. (2008). Elevators and escalators. Edoux hydraulic lift 1888. (Unpaginated).	87
Figure 101: CIBSE Heritage Group. (2008). Elevators and escalators. Amiot's stair climber, for serene ascent, 1889. (Unpaginated).	87
Figure 102: The Lascaille fire escape, a rope-type fire escape, disguised as a washstand, 1878. Wermiel, S. E. (2003). No exit: the rise and demise of the outside fire escape. p262.	89
Figure 103: Oppenheimer fire escape, parachute and overshoes, 1879. Wermiel, S. E. (2003). No exit: the rise and demise of the outside fire escape. p268.	89
Figure 104: Museum hlavního města Prahy (undated). Villa Muller, 1928. http://www.mullerovavila.cz/?q=english/node/413 Last accessed 05 August 2011.	95
Figure 105: Museum hlavního města Prahy (undated). Villa Muller interior. http://www.mullerovavila.cz/?q=english/node/429 Last accessed 05 August 2011.	96
Figure 106: Museum hlavního města Prahy (undated). Villa Muller interior. http://www.mullerovavila.cz/?q=english/node/429 Last accessed 05 August 2011.	96
Figure 107: Museum hlavního města Prahy (undated). Plan, Villa Muller. http://www.mullerovavila.cz/?q=english/node/410 Last accessed 05 August 2011.	97
Figure 108: Museum hlavního města Prahy (undated). Plan, Villa Muller. http://www.mullerovavila.cz/?q=english/node/410 Last accessed 05 August 2011.	97
Figure 109: Museum hlavního města Prahy (undated). Plan, Villa Muller. http://www.mullerovavila.cz/?q=english/node/410 Last accessed 05 August 2011.	97
Figure 110: Museum hlavního města Prahy (undated). Plan, Villa Muller. http://www.mullerovavila.cz/?q=english/node/410 Last accessed 05 August 2011.	97
Figure 111: Baan, I. (2009). Final wooden house 1. http://www.archdaily.com/7638/final-wooden-house-sou-fujimoto/ Last accessed 22 June 2011.	101
Figure 112: Baan, I. (2009). Final wooden house 2. http://www.archdaily.com/7638/final-wooden-house-sou-fujimoto/ Last accessed 22 June 2011.	101
Figure 113: Baan, I. (2009). Final wooden house 3. http://www.archdaily.com/7638/final-wooden-house-sou-fujimoto/ Last accessed 22 June 2011.	101
Figure 114: Baan, I. (2009). Final wooden house 4. http://www.archdaily.com/7638/final-wooden-house-sou-fujimoto/ Last accessed 22 June 2011.	101
Figure 115: Baan, I. (2009). Final wooden house 5. http://www.archdaily.com/7638/final-wooden-house-sou-fujimoto/ Last accessed 22 June 2011.	101
Figure 116: Baan, I. (2009). Final wooden house 6. http://www.archdaily.com/7638/final-wooden-house-sou-fujimoto/ Last accessed 22 June 2011.	101
Figure 117: Baan, I. (2009). Final wooden house 7. http://www.archdaily.com/7638/final-wooden-house-sou-fujimoto/ Last accessed 22 June 2011.	101
Figure 118: Baan, I. (2009). Final wooden house 8. http://www.archdaily.com/7638/final-wooden-house-sou-fujimoto/ Last accessed 22 June 2011.	101
Figure 119: Baan, I. (2009). Final wooden house 9. http://www.archdaily.com/7638/final-wooden-house-sou-fujimoto/ Last accessed 22 June 2011.	101
Figure 120: Baan, I. (2009). Final wooden house 10. http://www.archdaily.com/7638/final-wooden-house-sou-fujimoto/ Last accessed 22 June 2011.	101
Figure 121: Baan, I. (2009). House H, Tokyo, Japan, 2009, by Sou Fujimoto Architects. http://iwan.com/photo_Sou_Fujimoto_House_H_Tokyo.php Last accessed 24 June 2011.	102
Figure 122: Baan, I. (2009). House H by Sou Fujimoto. http://iwan.com/photo_Sou_Fujimoto_House_H_Tokyo.php Last accessed 24 June 2011.	102
Figure 123: Bow Wow Architects. (2006). House tower, Tokyo, Japan, 2006, by Bow Wow Architects. http://www.bow-wow.jp/profile/2006/HouseTower/index5.html Last accessed 24 June 2011.	102
Figure 124: Bow Wow Architects. (2006). House tower, bathroom. http://www.bow-wow.jp/profile/2006/HouseTower/index5.html Last accessed 24 June 2011.	102
Figure 125: Dettman, K. (2008). Tattoo house, Melbourne, Australia, 2008, by Andrew Maynard. http://www.maynardarchitects.com/Site/houses/Pages/Tattoo_House_4.html Last accessed 16 July 2011.	102
Figure 126: Chalmeau, S. (2009). Eva's bed by H2O architects. http://www.h2oarchitectes.com/projet/1/10/lit_Eva.html Last accessed 16 July 2011.	103
Figure 127: San, J. (2008). J-loft, Singapore, 2008, by Plystudio. http://ply-studio.com/?page_id=19 Last accessed 16 July 2011.	103
Figure 128: Asahi Kasei Homes. (2008). Plus-Nyan house by Asahi Kasei Homes, Tokyo, Japan, 2008. http://www.apartmenttherapy.com/la/pets-dogs-cats-snakes-etc/asahi-kasei-plusnyan-the-most-feline-friendly-house-065928 Last accessed 16 July 2011.	103
Figure 129: Asahi Kasei Homes. (2008). Plus-Nyan house, corner stair to the catwalk. http://www.asahi-kasei.co.jp/hebel/product/family/04.html Last accessed 16 July 2011.	103
Figure 130: Oudeman, F. and Karns, S. (2009). East village studio, New York City, Jordan Parnass Digital Architecture. http://jpda.net/projects/east-village-studio Last accessed 16 July 2011.	104

APPENDIX 1. RESEARCH BY DESIGN: EXPERIMENTS SERIES 2

SERIES 2 STEP 3. STAIR EXPERIMENT: MANIPULATION

Photograph existing stairs

Manipulate the stair images in Photoshop by using techniques such duplication, superpositioning, adding and subtracting layers, manipulate colour, hue, tone and filters, stretch, shrink, rotate and skew. Integrate with the paper model images

Document the process by recording each change

Observe the qualities that eventuate from these changes in scale, proportion, lighting, colour and layering

Step 3. Stair Experiment: Manipulation Cont.

Step 3. Stair Experiment: Manipulation Cont.

Step 3. Stair Experiment: Manipulation Cont.

Step 3. Stair Experiment: Manipulation Cont.

Step 3. Stair Experiment: Manipulation Cont.

Step 4. Stair Experiment: Manipulation :: Scale Cont.

Step 4. Stair Experiment: Manipulation :: Scale Cont.

Step 4. Stair Experiment: Manipulation :: Scale Cont.

Step 4. Stair Experiment: Manipulation :: Scale Cont.

STEP 4. STAIR EXPERIMENT: MANIPULATION :: SCALE :: PROXIMITY

STEP 4. STAIR EXPERIMENT: MANIPULATION :: SCALE :: PROXIMITY

APPENDIX 2. RESEARCH BY DESIGN: EXPERIMENTS SERIES 3

3 STEP 3. STAIR EXPERIMENT: MANIPULATION

SERIES

Photograph existing stairs

Manipulate the stair images in Photoshop by using techniques such duplication, superpositioning, adding and subtracting layers, manipulate colour, hue, tone and filters, stretch, shrink, rotate and skew. Integrate with the paper model images

Document the process by recording each change

Observe the qualities that eventuate from these changes in scale, proportion, lighting, colour and layering

Step 3. Stair Experiment: Manipulation.

Step 3. Stair Experiment: Manipulation Cont.

Step 3. Stair Experiment: Manipulation Cont.

Step 3. Stair Experiment: Manipulation Cont.

Step 3. Stair Experiment: Manipulation Cont.

STEP 4. STAIR EXPERIMENT: MANIPULATION :: SCALE

Manipulate the images with regard to scale and proportion in particular :: Document the process by recording each change :: Observe the q

Qualities that emerge with regard to changes in size and proportion; volumes, detail, relationships, proximity, connection and disconnection

Step 4. Stair Experiment: Manipulation :: Scale Cont.

Step 4. Stair Experiment: Manipulation :: Scale Cont.

STEP 4. STAIR EXPERIMENT: MANIPULATION :: SCALE :: MOVEMENT

STEP 4. STAIR EXPERIMENT: MANIPULATION :: SCALE :: MOVEMENT

APPENDIX 3. RESEARCH BY DESIGN: PAPER MODELS