Reactivating Dynamic Architecture

A STRATEGY TO INJECT RELEVANT BODILY IMAGERY BACK INTO ARCHITECTURE

A 120 point thesis submitted to the School of Architecture and Design, Victoria University of Wellington, in the fulfilment of the requirements for the degree of Masters of Architecture (Prof.)

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Abstract

The building-body analogy, which used to be crucial in the designing of buildings, to the exception of a few, is fading. This broken link leaves us with a melancholic yearning; a sense of loss. *Reactivating Dynamic Architecture* readdresses the use of the body in architecture by the application of an intervening design process. The processes we undertake in order to design architecture are too often assumed, and go unchallenged. In this thesis the design process is seen as a protagonist for change. Representation, both architectural and artistic, is a central theme as the thesis guides images of the human body through abstraction.

Both the dynamic body and fragmented body are investigated for their potential to create a relevant expression for the human condition. Dalibor Vesely's theory of the positive fragment is identified as a way forward for bodily fragmentation, and Analytical Cubism, which resonated with this theory, is explored.

The thesis initially moves through the investigation of historical interpretations of the body before drawing on contemporary theory. Past depictions of the fragmented and dynamic body are assessed in order to establish what they can offer us for future analysis. A representational mode is established, based on Cubism's methods, from here the transition from drawings to architecture begins. Rowe and Slutzky's text Transparency: Literal and Phenomenal is used to unravel the intricacies of Le Corbusier's Villa at Garches, and their reading of this building is used to channel a successful conversion process.

The resulting architecture was created as a trial of the strategy and is posed as an expression, or speculation, for what can be achieved through this method. Three different scale interventions are explored within the chosen site of Ava Train Station, Wellington. Carlo Scarpa's techniques guide the last transition to architecture, as his processes are recognised for their ability to fold meaning into design.

The described design process gathers complexity as it gains momentum; there is much to negotiate through the realms of bodily perception, modern art and architectural representation. However, the architectural expression carries that density of meaning in a simple expression.

Acknowledgements

Firstly I have to express my gratitude to my supervisor Philippe, who has been very supportive of me throughout this year. He was always generous with his time and encouragement, and pushed me further.

Thanks to everyone who helped me with formatting(wrestle with the computer programmes) in order to create this book.

Thank you to James and all my friends for helping me through this long thesis period.

Finally thanks to my Mum and Dad and the rest of my family who have been behind me these past five years.

Preface

When approaching topics for my thesis I was encouraged to focus upon something which resounded with me, a theme which would start an 'itch'.
I looked to my external sources of pleasure for inspiration and immediately turned to gymnastics.
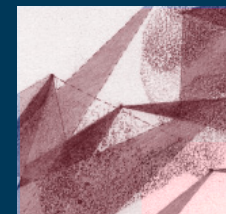I became interested in the idea of revitalising bodily imagery in architecture as I am a gymnastics coach and this leads me to look at the body in an unusual way. When I am coaching I see the body moving in front of me and I break it up into shapes and forms, similar to the way a film montage would break down frames of movement. I recognised this as an opportunity, and I have subsequently analysed forms like these through a series of explorations and have culminated this process with an architectural test.

Another passion of mine, art history, wound itself within my project with little provoking from me! I was delighted after my reading of Dalibor Veselys text, when my thesis took a turn towards the study of modern art techniques as I have always found this period of art production intriguing.

I think these two strains of study have come together in a creative way to create a provocative architectural result.

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Introduction

'The history of the bodily analogy in architecture, from Vitruvius to the present, might be described in one sense as the progressive distancing of the body from the building'.[1]

The human body's impact upon architecture (and also architecture upon the body) has always been profound. The forms, uses and matter of our structures slowly shift as our perception of the body evolves; the result is an expression of periods through time etched into our built surrounds. Indeed the knowledge we have of our physicality affects the way that we read a building. 'The experience of force and resistance, orientation and movement...balance and reciprocation, are first understood through the body',[2] and then from there we project this comprehension onto our built environment. We understand buildings as a whole created of parts, or parts of a whole, and this is reflected from our bodies. The interpretation of architecture is reliant on this metaphor, and it is an unconscious condition that humans instinctively resort to.

1   Vidler, Anthony, *The Architectural Uncanny: essays in the modern unhomely*, Cambridge, Mass: MIT Press. 1992 pg 221

2   Drake, Scott, "Monstrous Bodies: Architecture and the Play of Appearance," *Architectural Theory Review,* Vol. 5, No 1, 2000, pg 118

The slow shift of technology has recently become a swift slide of change. As the digital age exerts its presence on our modern culture the mark left on architecture is inevitable. However, this is not reason enough -as some may suggest- to abandon the position of the human body's importance in architectural creation. Although the direct analogy of the human body to our buildings has dissolved this does not mean it should be allowed to become extinct. The use of the body within a building's production takes the designer a step closer to creating architectural entities with humanistic qualities, architecture to better the well-being of its occupants.3 By analysing the body's use in an architectural process its potential may be realised.

This is not to suggest that this thesis proposes an anthropomorphic form of architecture. There are already many instances where these iterations are being explored, to varying degrees of success. This thesis will explore the position of the human body in motion, and investigate whether it can be used as a driving force behind the design process. A fundamental enquiry in the exploration of this topic will be to determine how the representation of

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3   Frascari, Marco, "A Tradition of Architectural Figures: A Search for Vita Beata". In *Body and Building: essays on the changing relation of body and architecture*, edited by George Dodds and Robert Tavernor, Cambridge, Mass: MIT Press, 2002 pg 260
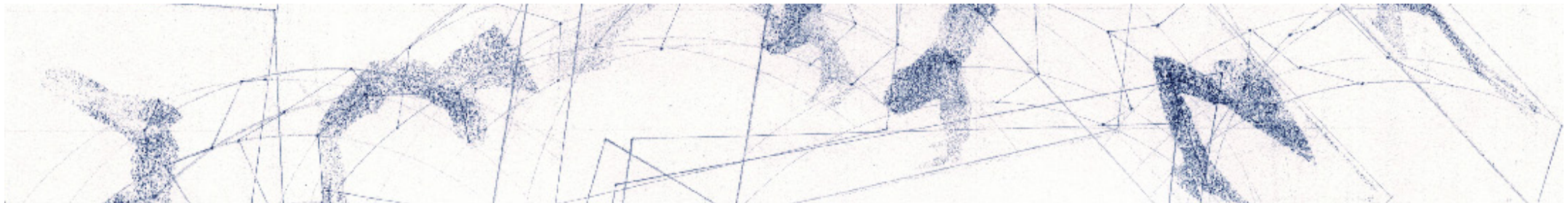
the dynamic body can affect an architectural result.

The human body in motion, or the *dynamic* body, has been identified as a field which has been underdeveloped in terms of architectural representation; this will be the starting point for experimentation. It is intended that a more relevant form of architecture can be created by engaging with the representation of the dynamic human body in a manner which encompasses, but moves forward, from the depictions of old. Running parallel to this course of enquiry is the analysis of bodily fragmentation. Fragmentation is often explored in correlation with the body but it is time to consider a restorative form of fragmentation, which could mediate the rupture between part and whole.

representation

-noun 1. The action or fact of exhibiting or producing in some visible image or form.

2. The action of presenting to the mind or imagination; an image or idea thus presented.

Architecture can develop interesting relationships with the act of representation. The use of representation is a primary theme for this text and therefore its meaning within this thesis deserves definition within this introduction. The function of an architectural representation depends on the stage of the project in which it is conceived. The first relationship that a representation has with architecture is a symbolic relationship between the building and its design process.[4] This is when the representation functions to act as a form of communication between designer and creator, facilitating the design process and exerting some control over the outcome.

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4   Alturk, Emre, "Architectural representation as medium of critical agencies", *The Journal of Architecture*, Vol. 13, No. 2, 2008 pg 133

The second major relationship between architecture and representation is its representations within media[5]. These images precede or succeed the end result of the building they are created to signify. This is when the representation attempts to depict architecture as an object in space. The materiality and atmosphere of the building is often portrayed, usually with a religious accuracy. Often the images may be created in an attempt to seduce or persuade viewers to the virtues of the building. This may seem necessary, as the charm of the building often is developed through seductive qualities of a representation. However, the glossy depictions which promote often lifeless buildings, have been conjured by 'deceptively nimble designers' to convince and manipulate a viewer, whether or not the building possesses the virtues that this depiction appears to promise[6].

The form of representation which is pertinent to this study is the first relationship; the working drawing, the conceptual image which facilitates the design process. Representation which is an instrument of generation 'not an end product, but an active component at phases of idealisation, conceptualisation, experimentation and visualisation'.[7] This is the stage of the project where the qualities of the architecture are determined, therefore if the notion of dynamicism is to be injected it has to be here. The challenge for this method will be taking a dynamic body (in motion) and converting

"what I'm interested in is how we might imagine space for these times; how we might pursue an alternative imagination.'

-Doreen Massey on the representation of space.

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5   Alturk, Emre, Architectural representation as medium of critical agencies, *The Journal of Architecture,* Vol. 13, No. 2, 2008 pg 133

6   Frascari, Marco, "A Tradition of Architectural Figures: A Search for Vita Beata". In *Body and Building: essays on the changing relation of body and architecture,* edited by George Dodds and Robert Tavernor, Cambridge, Mass: MIT Press, 2002, *pg 259*

7   Reinhardt, Dragmar, *Representation as research: Design Model and Media Rotation, The Journal of Architecture, Vol. 13, No. 2, 2008, pg 185*

it into the stable form of architecture without depleting the essence of its movement.

Structure of Thesis

The structure of the design process followed is mirrored in the flow of chapters. The process is clearly defined, the distinct portions of the body of work are investigated independently, and then merged to form a cohesive whole.

The design process begins with Movement, and travels into two dimensions as this bodily movement is explored through Drawing. Space Making follows this, then Architectural Fragments, finally the process culminates in an 'Architectural Expression', designed to test the method.

The movement stage is assumed within the writing, but the subsequent phases analysed so the results can be filtered into the design process. The drawing stage occupies two chapters as the two strains of study, fragmentation and movement, are developed.

Drawing   The first chapter *Reassembling the Body* explores the perception of the human body within contemporary culture. This perception is constantly one in flux, slowly evolving as our technology changes; art, science, and philosophy all have their own part to play. Representation of the body is explored and the impact that this has on the built environment. This initiates the discussion of Dalibor Vesely's notion of the positive fragment, and what this might offer us now in terms of creative design.

Drawing   *Fragments in Motion*: The parallel stream of study; bodily motion, is explored. This chapter also delves into the research of

manual modes of representation, and uncovers the challenges in depicting movement. Cubism is established as the primary vehicle for representational exploration, as it occurs within the theory of positive fragmentation, and opens up interesting realms of discussion in terms of movement. The results acquired from this study will be found at the intersections of these lines of thought.

Space Making

Chapter Three, *Translation* -although the most concise- is an integral chapter of the thesis. Here the two threads of discussion (the dynamic body and the positive fragment) have become thoroughly intertwined, and the conversion of these qualities into an architectural expression is explored.

Le Corbusier's Villa at Garches is the primary exemplar for this portion of the thesis. The analysis of this building will be driven by Rowe and Slutzsky's text, Transparency: Literal and Phenomenal. Their understanding of the architecture then forms the basis of the next transitional period.

Architectural Fragments

Mediating Part and Whole: This chapter looks at the functioning of a design process, in particular in an attempt to engage the concept of 'dark space' between phases which is not often discussed. Carlo Scarpa weaves through this chapter, as his transitions from drawing to architecture are masterly, and the design stage parallels his process.

The dialectic of part and whole is again explored, this time in terms of the architectural expression. Lastly 'Architectural Fragments' are defined and there use in aiding translation to architecture is established.

Architecture *Negotiating Architecture*: The last chapter is dedicated to a description of the design process which ran alongside the theoretical study of this thesis. Here the ideas are gathered and tested in the physical realm. Through discussion it is revealed that the process undertaken reflects and appropriates the concepts discussed in the earlier chapters. The architectural expression articulated at the end of the chapter is not posed as an end result, but rather presented as an exemplary engagment of the method.

This thesis initially develops its argument through the marriage of historical study and contemporary theories. This beginning portion evaluates what has been achieved in terms of architectural representation and what has yet to be explored.

The subsequent chapters develop ideas on what may be a relevant representational expression for today and the future. Throughout these areas of the thesis an exchange will occur between the study of current theory and the results of experimental studies. These ideas will transfer and transcend the boundaries of their communication as they inform one another in their findings.
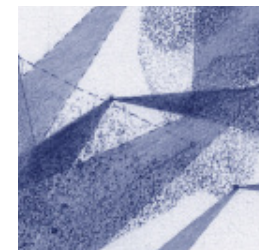
'We live today in the estrangement between self and other, between the self and the world, on the margins even between self and individual. Our perception is not structuring but nomadic. The experience of one's own body and of what is external to it is made up of heterogeneous ingredients, of atoms that do not compose molecules, of portions that fail to fit together. This erratic, nomadic perception of reality is such a feature of our crisis that architecture manifests it in a multitude of ways. It is not only fragmentation that fractures our projects into particles difficult to recompose. It is also the unfinished, the partial, and the cumulative that have become predominant in a way of working that presents itself as incapable of proposing any higher level of integration.'

–Ignasi de Sola- Morales

Fig. 1 Gabi Trinkaus, *Title Unknown.*
Magazine Clippings.

Reassembling the Body

'representation of the body is a necessary means by which architecture is able to act hermeneutically, providing a way in which bodies and buildings can be interpreted in relation to each other.'[8]

Humans' perceived role of their body in space has always been reliant on the changes of society. Our body image in history is reflected by the representations in art and architecture, but also by the writings and theories in science and philosophy.

In Western culture ancient and classical humans conceived that the body was a gift from God, and therefore it deserved to be revered as it had divine origins. These beliefs manifested themselves in a physical sense as a symmetrical and static whole, reflected onto the configuration of classical churches and buildings. Unity, rational and harmony were privileged ideas which guided designers through many centuries.

However, over time perceptions change, hence today's body image is seen as a distorted and reinterpreted version of those simple beginnings. This could

8   Drake, Scott, "Monstrous Bodies, architecture and the play of appearance", *Architectural theory review*: Journal of the Department of Architecture, Vol. 6 No. 1 (2001) pg 128
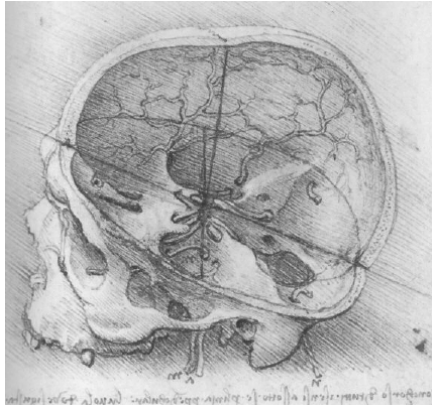
'[the interior view of the skull] was probably inspired by the by the architects habit of representing a building in terms of ground plan and cross section.'

-Ackerman

also be seen as a shift of priority; where in the earliest examples the whole is privileged, now emphasis is put upon the parts.

The metaphorical interpretation of the body in architecture is slowly retreating. The 'splintering of perspectives'[9] which has occurred was manifested in our architecture as a distorted or mangled body, with a decidedly un-humanistic quality. This interpretation reflects 'body-looks not body-images' and cannot be allowed to endure, as for our own wellbeing we need to consider a more holistic approach to design.[10] This chapter investigates how we could reinterpret our fragmented existence to something more accommodating for today, and using this knowledge, revitalise the use of the body in architectural processes.

The Changing World of the Corporeal

The fragmented body has gruesome origins, stemming from the literal dismemberment of bodies in science, and through many bloody conflicts. These factors kick started the changing of our body perception which continued slowly over many centuries.[11]

The fine arts have always depicted contemporary theories and topics, hence

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9   Agrest Diana, & Allen, Stan, *Practice: architecture, technique and representation*, Marston: G+B Arts International, 2000, pg 106. Agrest wrote of the city as a place of change in our modern world, and in particular about how the 'atomisation of information' reflects upon perception of our bodies by seeming to support the notion of fragmentation. She also wrote about how these ideas seemed to foster the idea of motion or speed.

10   Frascari, Marco, "A Tradition of Architectural Figures: A Search for Vita Beata". In *Body and Building: essays on the changing relation of body and architecture*, edited by George Dodds and Robert Tavernor, Cambridge, Mass: MIT Press, 2002 pg 260

11   Wegenstein, Bernadette, *Getting Under the Skin: Body and Media Theory*, Cambridge, Mass: MIT Press, 2006 pg 6 Wegenstein calls this period of change scientific fragmentation and refers to this era as where the body became 'objectified and isolated'.
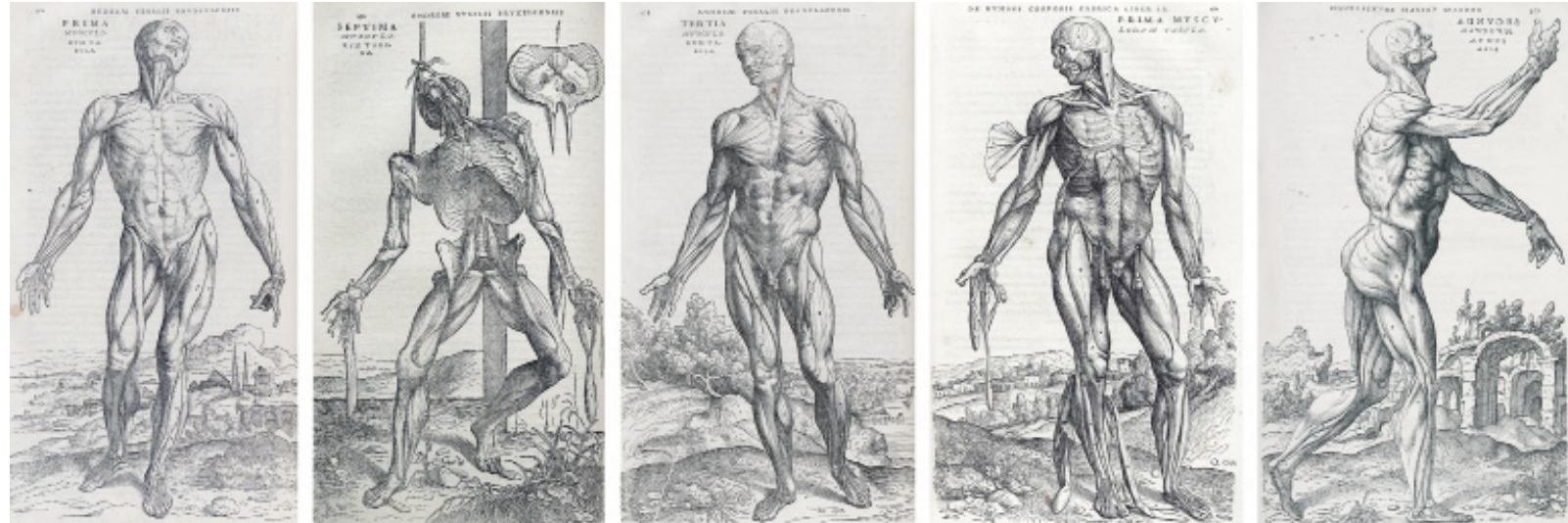
Fig. 3 (above) Vesalius, *Muscle-men, De Fabrica*

Fig. 2 (opposite) Leonardo Da Vinci, *The Human Cranium Sectioned*, c1489, Windsor Castle, The Royal Collection

the perception of the human body is documented through history in this mode. This chapter will first seek to demonstrate the changes surrounding bodily representation by looking to the art spectre.

The concept of the body being viewed as 'parts of a whole' coincides with developments in science, particularly in medicine.[12] To accurately represent these new discoveries artistic techniques were employed in the depictions of bodies, and therefore the essence of these changes- the 'body in pieces'- slowly filtered into art.

12   Between 1550 and 1650 the procedure of autopsy became widespread throughout Europe, and dissections became common place in universities. Therefore a flood of new information on the inner workings of our bodies became available. This was roughly the same period that major changes were occurring in the role of the architect, and architectural drawing became established. Prior to this period anatomical illustrations had not typically been drawn from observation but rather, they had been conceived from the well entrenched scientific teachings of the ancients. Dissection started a new perception of the fragmented human body which was visually interpreted as scientific studies of the body, featuring in major anatomical textbooks..

Fig. 4 Edgar Degas, *Ludovic Lepic and Daughters in the Place de la Concorde* mid 1870s. Oil on Canvas. destroyed during World War II.

MATIERE À REFLECTION POUR LES JONGLEURS COURONNÉES

quun sang impur abreuve nos Sillons.

Fig. 5 Villeneuve, *Food for Thought for Crowned Charlatans*, 1793. Engraving. Musee Carnavalet, Paris.

Linda Nochlin, in her text *The Body in Pieces* argues that the 'part' or 'fragment' is a metaphor for modernity. She illustrates this statement with a variety of artworks ranging from mid 1700's to late 1900's often showing the body dissembled. Throughout this time art went from depicting the body literally in pieces to metaphorically in pieces. Mutilation is a common theme of the early works, the more grotesque portrayals often stemming from propaganda surrounding the French Revolution.[13]

This spirit of these concepts continued through to the 19th century. Even the Impressionists portrayed the theme, albeit in a more conservative manner, supported by a traditional framework. They often represented their subjects in slightly off-balanced compositions and so instilled 'a sense of that loss of solidarity, a compensatory dynamism and flow'[14] Within the canvases of Manet and Degas many of their characters are shown in the uneasy predicament of being 'cut off' by the paintings edge. Degas' layout of his famous images of dancers on stage often interrupts their bodies.
The inclusion of these techniques meant that their artworks were infused with the ideas of the time; movement and fragmentation. However subtly they co- existed, sealed within the patina of the oil paint.
Although the medium available changes according to the latest technology available, the theme of the fragmented body continues in art to today.

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13   Nochlin, Linda, *The Body in Pieces: the fragment as a metaphor of modernity*, New York: Thames and Hudson, 1994, pg 8 In fact Nochlin cites the French Revolution as the 'transformative event that ushered in the modern period'.

14   Ibid. pg 25

The Shifting Face of Architecture

Architecture took longer to grasp the changing corporeal image in the world. But the changes, captured so fluently by artists, did slowly flow into the built environment. Glen Seator writes about the transformations which architecture has undergone due to our changing bodily perception. He describes three major steps, classical analogy as the first, followed by the Modernists empathetic use of physiological projection. He concludes that we now incorporate the body into our built work by 'affect' 'that is the body is admitted only as trace, as hidden in the fragmentary associational mappings of memory and direct apperception'[15]. This is indeed the stance with which many contemporary architectural theorists now align themselves, a phenomenological perspective. However, as Frascari argues, this abandonment of physical corporeality in architecture should never be allowed to endure. Frascari argues for *vita beata*, a happy and healthy existence, which could possibly be attained by the 'sympathetic dance between body and buildings... gathered from the interaction between corporeal images and building images'.[16]

Although the physicality of the body cannot be admitted into architecture in the manner it once was, it is valid to experiment with other solutions, as this thesis intends to do.

Fig. 6   Lucy   Mcrae,   *Body Architecture,* Installation.

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15   Seator, Glen, & Casabere, James, *The Architectural Unconscious*, Andover, Mass: Addison Gallery of American Art, 2000 pg 45

16   Frascari, Marco, "A Tradition of Architectural Figures: A Search for Vita Beata". In *Body and Building: essays on the changing relation of body and architecture*, edited by George Dodds and Robert Tavernor, Cambridge, Mass: MIT Press, 2002 pg 260
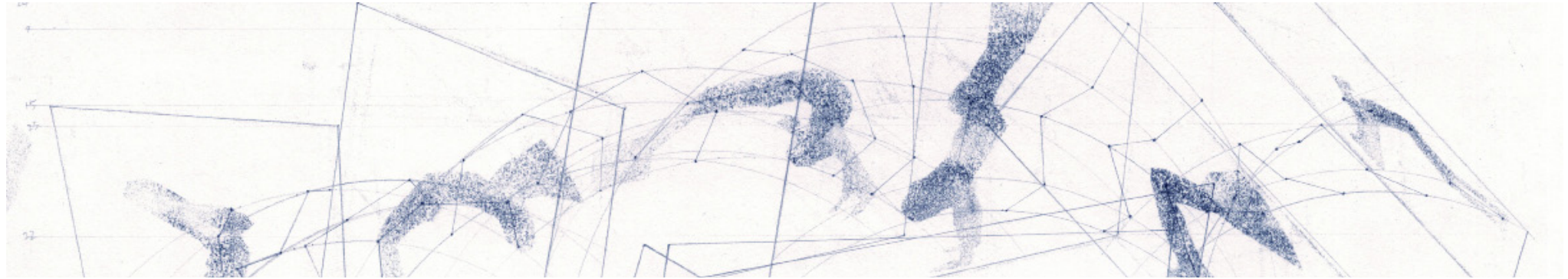
The architectural drawing is transitive in nature... but technique is never neutral and the means of representation, the working methods of the architect, will always condition the results."[17]

'It is the explosion, the fragmented unconscious, where the "architectural body" does not reflect the body of the subject, as it did in the Renaissance, but reflects instead the perception of the fragmented body...the system has been broken; architecture cannot be recognised again as a whole.'

    - Diana Agrest *Architecture Without*, p 190

Visual interpretations of these changing ideas have been constructed throughout history. The next pages will examine two archetypal examples of the drawing of the human body within the architectural sphere, Da Vinci's Vitruvian Man and Le Corbusier's Modulor. These images have directly influenced the creation of buildings through the transferral of their ideas to architectural drawings. The circumstances under which they created these representations conditioned the result so these will also be examined, along with their stylistic concerns.

17   Allen, Stan, *Practice: architecture, technique + representation*, (second edition) New York: Routledge, 2009 pg 45
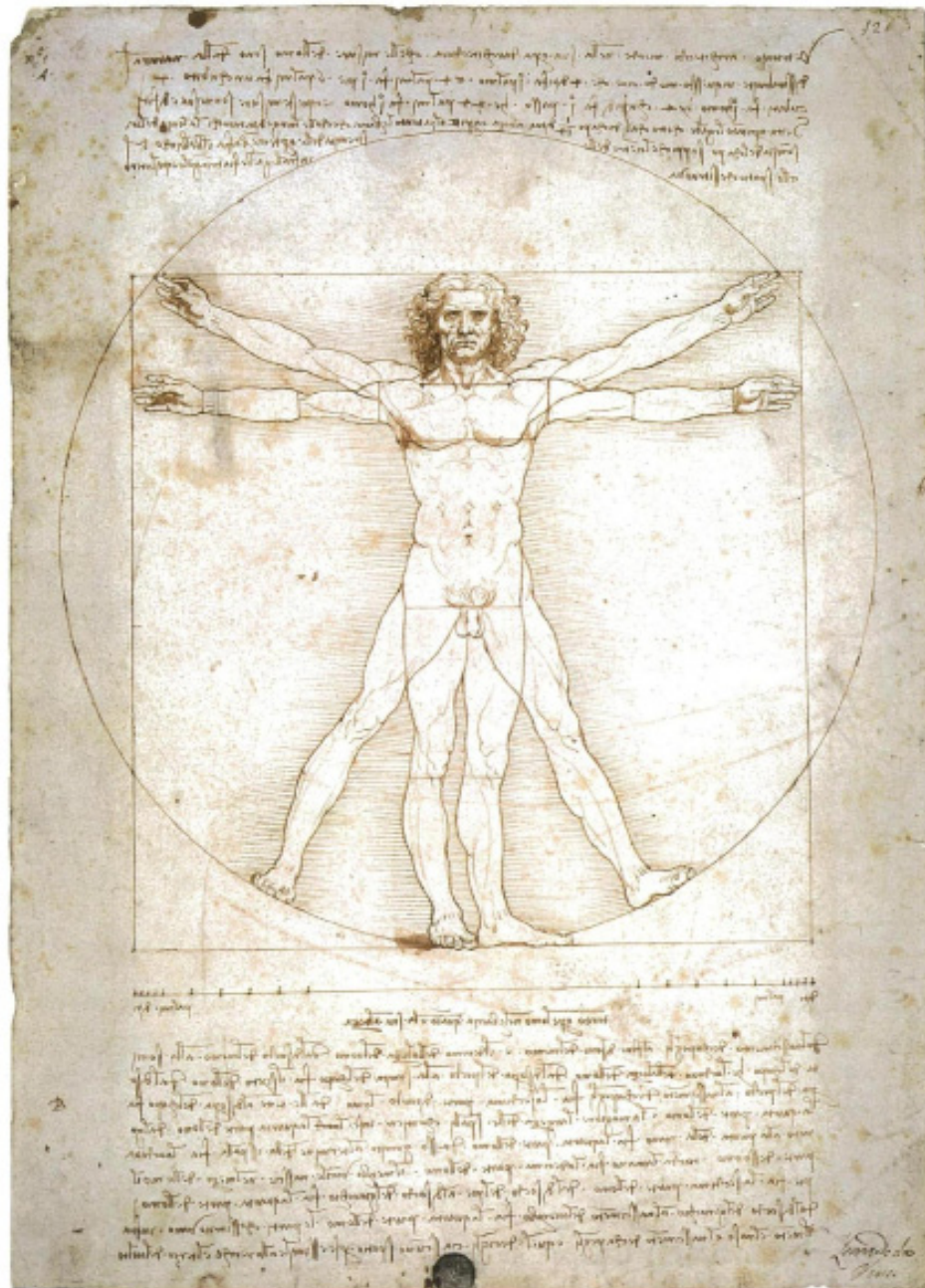
'The whole is more than the sum of its parts'
-Aristotle

Fig. 7 Leonardo Da Vinci, *The Vitruvian Man,* c1490, Venice, Galleria dell'Accademia

Classical Analogy- The Vitruvian Man

'[The Vitruvian Man] merges the continuous quantity of the human body with basic geometry that operates at the grandest scale that could be envisaged.'[18]

The *Viturvian Man* has become a cliché in the magnificently direct way it deals with the image of rational man. The divine man is considered as one of unity, balance, and wholeness. The centre or -by anthropomorphic slippage- the navel, is engaged here. Da Vinci's *Vitruvian Man* is a success because his mans navel could possess the very centre of the circle which encompasses him.[19]

There is a contradiction in Leonardo's interpretation which is not palpable to the naive viewer. James Ackerman recognises this incongruity when placing the depiction in the context of Da Vinci's other work:
'Leonardo's drawing, which adds a circle to the square, effectively represents the Vitruvian principle but is actually in conflict with his own convictions about proportions, which vigorously opposed the Roman straitjacket.'[20]

The Renaissance belief in 'imitation' is actually the true creator of this image. The existence of the depiction illuminates the unshakeable belief of men at this time; that the word of the ancients outweighed their own understanding

18   Kemp, Martin, *Leonardo Da Vinci, Experience, Experiment and Design*, London: V&A Publications, 2006 pg 87

19   Other attempts, such as Francesco di Giorgio's, within the same period, had tried to make the circle and square of equal heights and therefore not achieved this harmonious overlaying of parts. It is also noteworthy to add that other cultures also use this form of composition, the Hindu Vastu Purusha, as an example of a spatial organisation device which takes the form of a body.

20   Ackerman, James, *Origins, Imitation, Conventions: representation in the visual arts,* Cambridge, Mass: MIT Press, 2001 pg 157

of the world.[21] This portrayal was the representation of a concept which Vitruvius, the renowned ancient scholar, had expressed in his treatise 'De Architectura' and the result is conditioned according to this text.

The sharply controlled drawing style of the *Vitruvian Man* belongs to Da Vinci's earlier work and it contrasts against his later sketches which possess soft edges, light and atmosphere.[22] The drawing is composed of pen and ink with wash over metalpoint. The drawing of the man in his two states, (one with legs together, arms parallel to the ground and one with legs and arms further outstretched) was perhaps Leonardo's concession to himself. If he could not depict the dynamic human body as he had so readily in the past he would hint at movement, or at least mans ability to move, in the overlaying of poses.

'centralized churches epitomize a universal stability and calmness of spirit typical of classical art.'[23]

Da Vinci's square and circle can be seen as similar to working lines setting out major geometries in an architect's plan, they are precise, ruled, and purposeful. They frame the figure and present him as the focus. Further rendering is found on his face, hair and at the far reaches of his limbs. This attention to detail brings the figure forward from the page. This further accentuates him as the object, and the circle and square as his ground.

21   Kemp, Martin, *Leonardo Da Vinci, Experience, Experiment and Design,* London: V&A Publications, 2006 Pg 87

22   Ackerman, James, *Origins, Imitation, Conventions: representation in the visual arts*, Cambridge, Mass: MIT Press, 2001 pg 145

23   Evans Robin, *The Projective Cast: architecture and its three geometries*, Cambridge, Mass: MIT Press, 1995 pg 55. Although Evans challenges this view in his chapter Perturbed Circles he recognizes it as the orthodox view.

Fig. 8 Leonardo Da Vinci, *Design for a Centalized Temple,* c1488, Institut de France, Paris

Like the neo-classical architecture of the day, the *Vitruvian Man* is symmetrical and unified. It represents a rational approach to Renaissance thinkers. It can be easily juxtaposed with architectural drawings. The circle and square, their proportions proved as 'divine', can be extrapolated from this setting and onto plans of buildings, in fact the few churches which Da Vinci, and other architects of this era, did design echo these geometries.

Physiological Projection- The Modulor

Fig. 9 Le Corbusier, T*he Modulor,* 1955

[the Modulor]'makes the bad difficult and the good easy' -Einstein

Typical of Le Corbusier, *The Modulor* his proportioning system, has always oozed qualities of an almost fanatical passion, and a moral outlook reflected in him.[24] The Modulor was a break in the movement away from the body. The aim of Le Corbusier's modulor system was to 'harmonise and standardise'[25], as these were appropriate goals for a world just beginning to embrace the ideas of pre-fabricated architecture.

Le Corbusier's man is very different to Da Vinci's, the physical qualities of the figure being the only point of comparison. The navel is acknowledged here also, with the line that intersects the man at that point, but Le Corbusier places two more parallel lines in decreasing increments above it, meaning it no longer signifies the balanced middle. To further accentuate the idea of asymmetry the man is captured mid gesture, in the act of lifting one arm. Le Corbusier intended this image to be juxtaposed with Da Vinci's and hoped that this pose would establish his example as modern. He describes the figure as a 'man walking across space. That is a dynamic man, corresponding to a dynamic architecture.'[26]

The arm stretched above the person loosely hovers in an almost casual manner, bounding the entirety of the frame to the figure. It is this gesture

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24   Blake, Peter, *Le Corbusier, Architecture and Form,* Harmondsworth : Penguin, 1963 pg 140

25   Le Corbusier, *The Modulor, a harmonious measure to the human scale universally applicable to architecture and mechanics,* London: Faber, 1956, pg 107

26   Le Corbusier, *The Modulor 2 1955,* Cambridge, Mass., M.I.T. Press, 1958 pg 45

Fig. 10 Le Corbuiser, *Unite D'Habitation*, Marseilles
Photographer Unknown.

that brings forth the idea that this subject is occupying this frame, therefore applying an architectural physicality to the grid. The most noteworthy stylistic component of the depiction is the figure itself. Le Corbusier has constructed its form as a block of colour, a silhouette, which was a symbol of all men not *a* man.

Le Corbusier tested his system on the Unite d'Habitation, an apartment building in Marseilles. The inclusion of the proportioning method was extremely important to him[27] as he strongly believed that it would better the experience of the occupants within. Although the proportioning system was relatively successful in the projects which it was included, it was a grasping attempt of Le Corbusier's to create an overarching system which would 'leave the imprint of man on an architecture of the machine age'[28]. However, the concept was not taken up by other architects, most probably because it contrasted against the accepted use of the body within this age, and therefore the idea did not endure.

Both of these archetypal examples, Da Vinci's and Le Corbusier's, reflect elements of the era from which it was created. Each instance represents a design system of conversion process, Le Corbusier's method allowing a direct projection from drawing to architecture, whereas Da Vinci's image was more a reflection of the general methodology of the time.
Le Corbusier's example was a little less orthodox, as it did not reference the fragmentation which was already deeply rooted in body theory by this time. Both these examples hint towards a dynamicism of the body, but, as shown in this thesis, the potential that this idea holds has not been realised.

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27   Blake, Peter, *Le Corbusier, Architecture and Form*, Harmondsworth : Penguin, 1963, pg 140
28   Ibid. 143

Crisis of Unity

'The body became more an object of nostalgia than a model of harmony, manifested in art as a series of irreconcilable fragments: the "parts," for example, in Mary Shelleys story of Frankenstein, that could never be assembled into anything but a monster.'[29]

As the perceived fragmentation of the human condition accelerated a creeping sense of loss accompanied the move away from the whole.[30] The term fragmentation can be perceived as being interchangeable with disintegration and chaos. Both of these terms have decidedly pessimistic connotations when we apply them physically.

The conditions which determine the negative slant to this term is the ambiguity, or isolation, which a fragment implies, the 'shattering of connections'[31], the violent displacement from a larger whole. Linda Nochlin's examples of grotesquely mutilated bodies in 18th century art are a classic example of the negative power of the fragment.

These ideas were viewed as desirable in their dramatic and stirring qualities to architects of the late 1980's. This led to the manifestation of the 'uncanny',

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29   Vidler, Anthony, *The Architectural Uncanny: essays in the modern unhomely*, Cambridge, Mass: MIT Press, 1992 pg 77

30   Ibid. pg 76

31   Nochlin, Linda, *The Body in Pieces: the fragment as a metaphor of modernity*, New York: Thames and Hudson, 1994 pg 24

or disturbing quality of the fragment in Deconstructivist architecture. The human condition was projected onto architecture in this unsettling manner by Coop Himmelblau. The practice was fascinated by our bodily condition and tried to infuse the body's language into their work. Coop Himmelblau wanted their architecture to live and breathe, and so they superimposed dismembered physicality onto their structures so 'our eyes became towers, our foreheads bridges, the faces became landscapes and our shirts the plans'.[32] This fragmentation of the body led to disembodied connotations, synonymous with loss. The forms which this architecture promoted celebrated ideas such as displacement, distortion and rupture, and undermined any ancient traditions of order and purity.[33] In this form of architecture the whole was considered subordinate to its parts.

The 'crisis of unity' coincided with the rise of the digital age and these two rising forces no doubt drew strength from the emergence of one another. However within today's society the impact of the digital has settled to a place where its disturbing characteristics diminish with increasing familiarity. Therefore the dynamic and rousing features of the destructive fragment no longer wash with audiences of today. The new search is for an architecture, or process which can activate the positive characteristics of the fragment; architecture which acknowledges the fragment as a symptom of the time but refuses to be subservient to it.

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32   Vidler, Anthony, *The Architectural Uncanny: essays in the modern unhomely*, Cambridge, Mass: MIT Press, 1992, pg 76

33   Mcleod, Mary, "'Order in the details', 'tumult in the whole'?: composition and fragmentation in Le Corbusier's architecture". In *Fragments: architecture and the unfinished : essays presented to Robin Middleton*, edited by Barry Bergdoll with Werner Oechslin, London: Thames and Hudson, 2006 pg 291

The Positive Fragment

The Rehabilitation of Fragment is Dalibor Vesely's chapter where he tries to identify a solution for dealing with the fragmentation phenomenon today. Within this text he identifies several places where art has attempted to bring out qualities of a positive fragment, and uses these examples to explain the theory.

Paul Cézanne's irregularly composed artworks were one of the places where the restorative fragment was recognised. Colour was used as the main instigator of the phenomenon, Cézanne believed that colour could not be considered as an isolated element because it 'belonged to the fundamental nature of things, to their primordial situatedness and thus to the plenitude of their thingness.'[34] Cezanne was not denying the appearance of the fragmented strokes of block colour, but he was recognising their role as individual parts, which together make the image whole.

Vesely identifies Analytical Cubism as a period where the positive role of the fragment is at its strongest. Analytical Cubism is laden with ambiguity which has been achieved through the dissolution of the object; it is in this ambiguous state that the fragment plays its most important role.[35] The techniques Cubist artists used created a new structure for space, where the objects are not only transformed, but are also continuously described or referred to by the collection of fragments. This new structure is described by Vesely as a "latent world" where the space amid objects becomes its own

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34   Vesely, Dalibor, *Architecture in the Age of Divided Representation: the question of creativity in the shadow of production*, Cambridge, Mass: MIT Press, 2004 pg 335

35   Ibid. pg 338

entity. Georges Braque comments on this:

'It seems to me just as difficult to paint the spaces 'between' as the things themselves. The space 'between' seems to me to be as essential an element as what they call the object. The subject matter consists precisely of the relationship between these objects and between the object and the intervening spaces. How can I say what the picture is of when relationships are always things that change? What counts is this transformation.'[36]

All functions of positive fragments have one thing in common, they are continuously mitigating between the part and whole. They exist as parts but function as, and for, the whole. Architecture holds complexity and contradiction, and the contradiction between part and whole in the restorative fragment is recognised and exploited.

In order to capitalise on this phenomenon cues will be taken from art, and applied to the early stages of the design method. To create a contemporary expression the positive fragment will be integrated and aligned with the dynamic body within the process. This body in motion will add another layer of complexity, as it will now be developed through the lens of a fragmented entity. The next chapter will investigate the dynamic figure, and then the assimilation of these two body conditions.

Fig. 11 Georges Braque, *Still Life with Violin and Pitcher*, 1910, Oil on Canvas. Kunstmuseum, Basel

36   Braque, Georges, Quoted in Dalibor Vesely, *Architecture in the Age of Divided Representation: the question of creativity in the shadow of production*, Cambridge, Mass: MIT Press, 2004
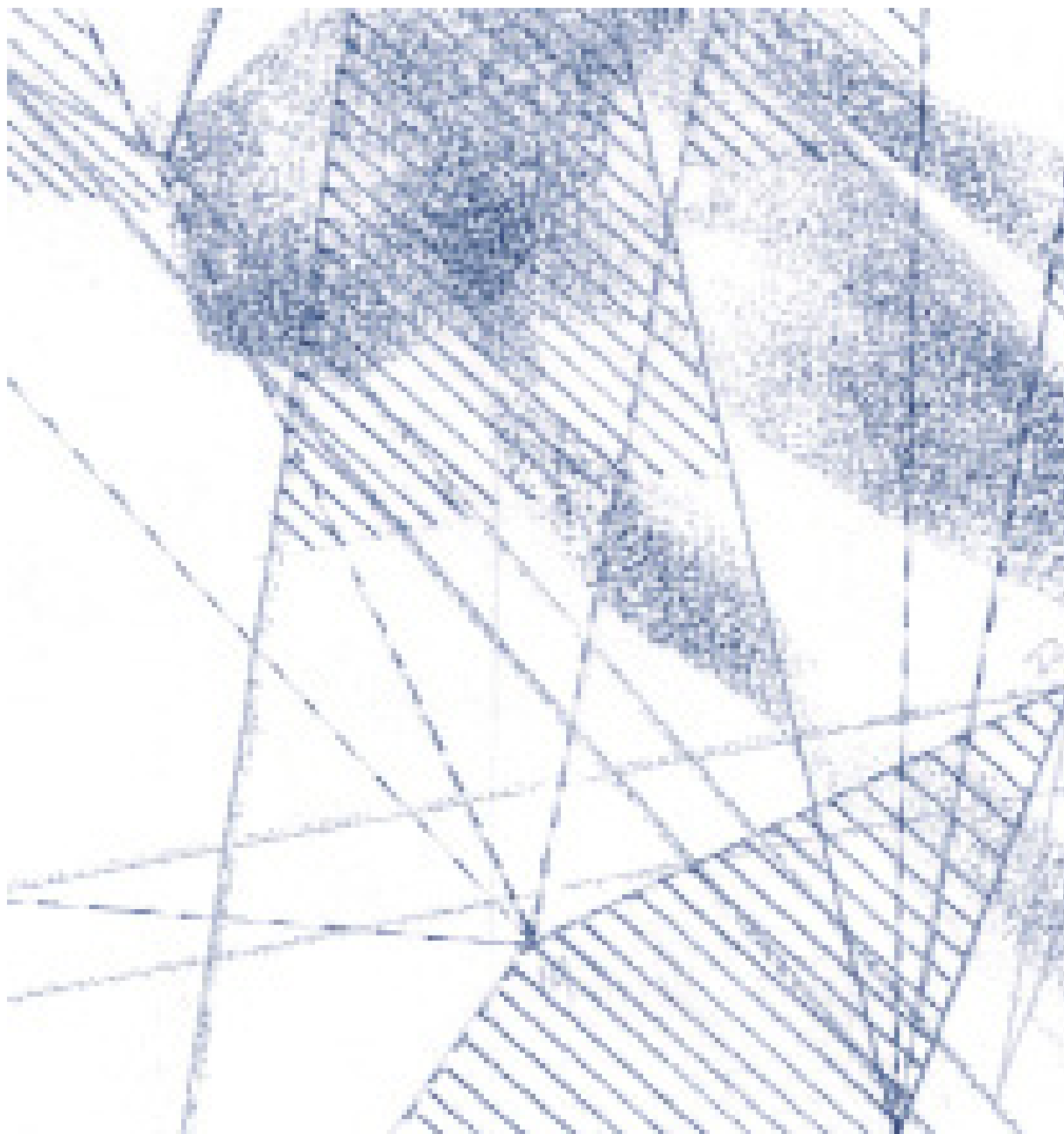
The configuration of geometrical lines and fragments in the Synthetic Cubists paintings offer... a transition to a world in the process of construction, where the resulting configuration remains only a mediating representation. And this representation offers a means of participating in the world afresh; it is not an end in itself. The space of a painting is not a space that can be understood through geometry or formal structure, but as a living structure in which the metaphorical power of the fragment plays a decisive role.

- Robin Middleton

Fragments in Motion

The modern individual is, above all else, a mobile human being.'[37]

Mobility is now a conscious theme of the modern condition. This topic courses through contemporary theories of our bodies and cities.[38] The rapid response of culture to our ever evolving world picks up pace with each successive generation. Consequently we are no longer satisfied with the translation of the whole, stationary body into space.
However, apart from anthropomorphic interpretations, the idea of the body in motion has never successfully transcended into the realm of architecture. The major hurdle in the conversion of this idea has always been the problem of the dynamic body's representation, and the limitations in dealing with this. It is therefore time to push the boundaries of design in order to explore what is possible.

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37   Sennett, Richard, *Flesh and Stone: The Body and City in Western Civilization*, New York: W.W. Norton, 1994 pg 15

38   Cresswell, Tim, *On the Move: Mobility in the Modern Western World*, Hoboken: Routledge, 2006 pg 1
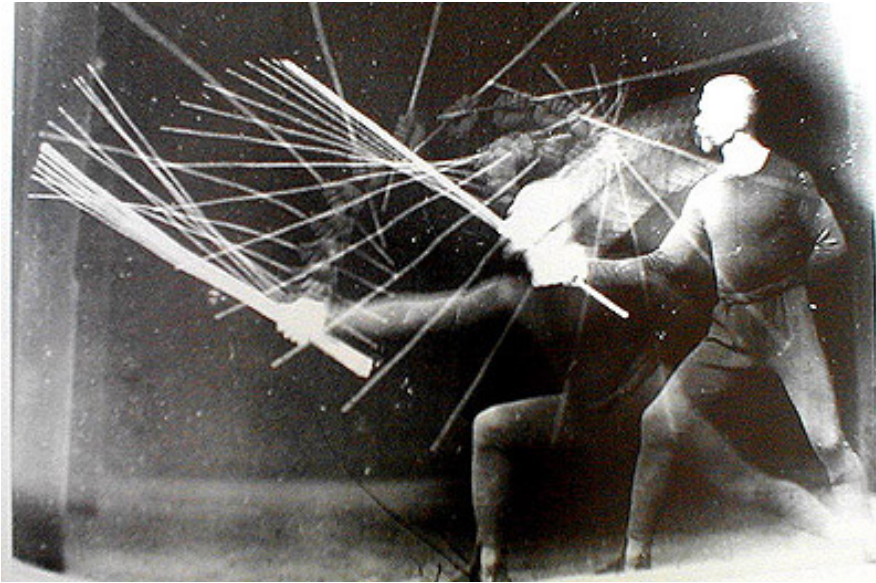
Fig. 12 Etienne-Jules Marey, *Figure Fencing Study*, 1890

This chapter first looks back at art and science's experimentations with the human body in motion, in order to see what this can offer us. It then moves to explore the means to translate the qualities inherent in bodily movement into a representation truly imbued with the spirit of motion. It has been established that the positive fragment could be the way forward to a humanistic, but relevant approach for using the body, and it is from this angle that the dynamic human body will now be explored. Analytical Cubism will be investigated, and a reconfigured version of this sought as a vehicle for activating the positive fragment.

The Problem with Motion

The slippery presence, or 'non-presence' of movement, has often been a subject of debate around discussions of artistic and architectural representation. The problem is obvious, how do we compress many moments and spaces into one two dimensional frame? Three dimensional depiction devices can be employed to try and solve the issue of depth, but the image will still be frozen in time, just an indication of a wider gesture.

In Doreen Massey's *For Space* she advocates the provoking of change in order to further develop our engagement with space. She quotes the theorist, Ernesto Laclau who suggests one way of representing movement:

'any representation of a dislocation involves its spatialisation. The way to overcome the temporal, traumatic and unrepresentable nature of dislocation is to construct it as movement in permanent structural relation with other movements, in which case the pure temporality of the 'event' is eliminated...[39]

It is important here to draw attention to the adjective which Laclau uses to describe the representation of movement: 'traumatic'. This term infers a wider significance; as if the geneses of such representations are a distressing event, which involves the ripping or fracturing of the time/space continuum. Laclau's evocative description echoes the stirring language of the Deconstructivists. However, they relished the use of these expressions, and did not imply the pessimistic slant which Laclau appears to infuse into his statement.

Fortunately, Laclau offers a possible alternative to this seemingly horrific occurrence, a way to overcome the fracturing. The response which he describes is to nestle the image within a larger framework. This structuring will recognise the original context and therefore the essence of the movement will be maintained. This answer which Laclau provides seems synonymous with the positive form of fragmentation, as described by Dalibor Vesely. The proposal of recognition of context adheres to Vesely's principals. Also, by breaking up motion in order to present it in series, this provides "objects" to interact with each other and their ground, as described by Vesely in his example of the restorative fragment in Cubist art. By structuring the representation this way the possibility of opening up that 'latent world' is pursued.

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39   Ernesto Laclau In Massey, Doreen, *For Space*, London: SAGE, 2005, pg 25

Massey turns to another well known source of architectural debate, the theories of Deleuze and Guatarri, in order to further articulate her desire for change in the representation of space. This concern of space is still relevant to the study of movement. Space and movement are intrinsically linked, as movement occurs through space. Therefore the representation of space needs to be adapted to accommodate the elusive quality of movement. Deleuze and Guatarri believe that

'representation is no longer a process of fixing, but an element in a continuous production... an activity, a practice an embedded engagement of the world of which it is a part. Not representation but experimentation.'[40]

The process they describe again seems to be a form of framework or methodology which needs to be engaged with in order to break from the stagnant processes which have already been exhausted. They repel the idea of 'fixing' the representation and imply instead that the solution is a fluid response, 'experimentation' which fluctuates and changes responding to its content.

The resolution of these ideas, which can be carried through to the design stage of this thesis, appears to be a motion towards experimentation. If representation is engaged with physically, and recorded and analysed in an analytical manner, it may yield results which can be processed through the design.

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40   Deleuze and Guattari in Massey, Doreen, *For Space*, London: SAGE, 2005, pg 28

Movement in the Still Frame

'... his "decompositions" came to be reread as a means of portraying a different reality, one whose essence was duration- the unstoppable, unending flow of time.'[41]

Fig. 13   Etienne-Jules   Marey,   *Gymnast jumping over a chair,* 1883. Photograph.

Representation of the dynamic body is key to its understanding. Etienne-Jules Marey the physiologist, and Eadweard Muybridge the photographer, were primary contributors to the furthering of knowledge in this area in the early 20th century. They each underwent photographic studies of the topic, resulting in curious imagery. The compositions ensuing from these experiments are a 'hybrid mixture of medicine, science and art.'[42] Marey's images abandon the dividing frame of Muybridge's photographic stills, and compress his information into one image, recalling the theme of simultaneity which was a prevalent subject matter of his time. Fortunately Marey's results were more than just data, they had an ethereal quality, almost ghostly in the way they tracked movement across space. The qualities which Marey captured were a reflection of both his techniques and subject.

41   Braun, Marta, *Picturing Time: the work of Etienne-Jules Marey (1840-1904),* Chicago: The University of Chicago Press, 1992, pg 277

42   Cresswell, Tim, *On the Move: Mobility in the Modern Western World,* Hoboken: Routledge, 2006 pg 64
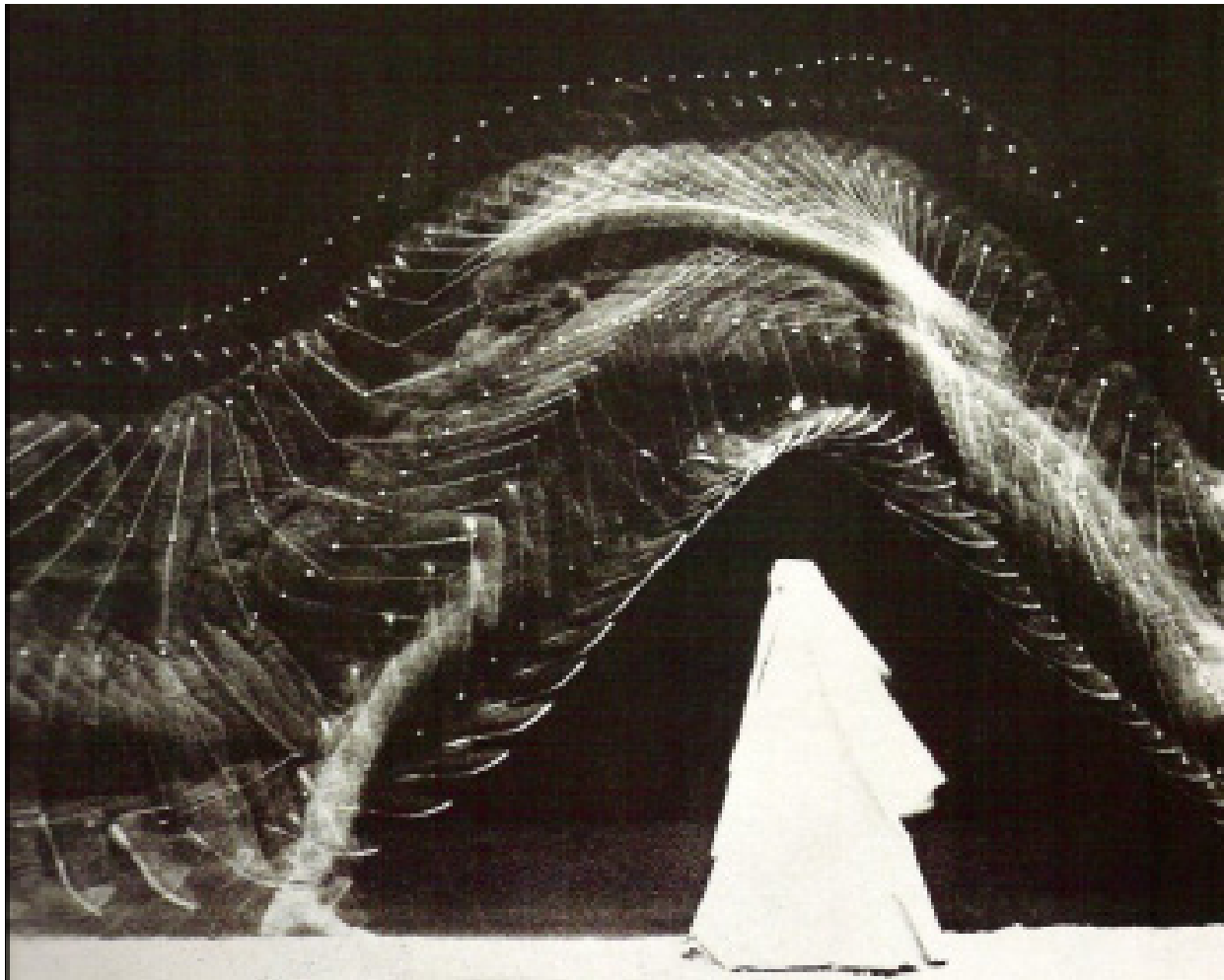
'The understanding of a movement implies a double knowledge, namely, that of space as well as that of time.'

-Etienne-Jules Marey

Fig. 14   Etienne-Jules Marey,   *Figure Hurdling*. 1885. Photograph

Chronophotography, the technique devised by Marey and his contemporaries, had huge bearing on fine art of the following period.[43] This form of representation provided a blueprint for depicting movement, which artists recognised as having untapped potential. The spirit of the time was one for embracing change and the positivity of this era is reflected in the endless reproductions of this theme. The photos provided artists with another tool, a language to characterise simultaneity, motion and the passing of time. [44]

Cubism Meets Motion

'The wholes established by technology do not make us feel complete or satisfied, they are still experienced as splintered wholes. Here and there, man recognises and greets a fragment of his former universe, integrated in a functional but alien anonymous whole, in which he nevertheless must live. There is no other. Against that feeling and splintering, modern man feels a keen desire for all-inclusiveness, for synthesis. But, alas, any synthesis produced by technology fails and comes to naught.'[45]

Cezanne showed us forms living in the reality of light, Picasso brings us a material account of their real in the mind- he lays out a free mobile perspective.

-Linda Henderson

The void which has been ruptured open by technology is yet to be filled. Cubism may hold the answer to activating the rehabilitative fragment, and consequently, combating the sense of loss still settling from body abandonment. Robin Evans recognised Cubism's ability to gather fragments in a unified whole: 'It is a question of emphasis. If the stress is placed on the

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43   Braun, Marta, *Picturing Time: the work of Etienne-Jules Marey (1840-1904)*, Chicago: The University of Chicago Press, 1992, pg 281

44   Ibid.

45   Jacques Ellul quoted in Vesely, Deborah, *Architecture in the Age of Divided Representation: the question of creativity in the shadow of production*, Cambridge, Mass: MIT Press, 2004 pg 315.

totality of the simultaneously presented image, cubism aims for wholeness'[46]. Of course this also suggests that the reading of the image could privilege the parts rather than the whole if a viewer was so inclined. The real concern here is how to find equilibrium between part and whole, fragment and totality.

The adaption of the rhythmical parallel forms within Marey's photographs can be found in *Nude Descending a Staircase*,[47] the pseudo-cubist artwork. Provocative artist Marcel Duchamp is responsible for this image, which straddles the language and theories of many movements. This artwork pulls together the two strains of the drawing section of this thesis, cubism (the positive fragment) and bodily motion.

The human form plays across Duchamp's canvas, slicing the space into facets of tone. Quick strokes divide the image, and the choppy layering of shapes denotes the staggered movement down a staircase. Duchamp unashamedly took traditional cubist techniques but applied them in an unusual manner. Instead of building up the appearance of an object by interlocking many different focal points in one image, he took many different moments in time and overlaid them, developing the manifestation of a single movement. This image was never accepted as a pure cubist painting because it did not embrace many of cubism's fundamentals.[48] The key quality missing, arguably, could be implication of the creator's movement in space.

46   Evans, Robin, *The Projective Cast: architecture and its three geometries*, Cambridge, Mass: MIT Press, 1995, pg 59

47   Braun, Marta, *Picturing Time: the work of Etienne-Jules Marey (1840-1904)*, Chicago: The University of Chicago Press, 1992, pg 265

48   Mink, Janis, *Marcel Duchamp: Art as Anti Art*, Koln, West Germany : Taschen, 1994, pg 27

The multiple reading of the artwork is a quintessential quality of cubism. The dilation of the viewer's eye moving in and out across the canvas, transitioning between the faceted forms, and travelling through the shallow depths of the image, is metaphorical of the painter's process as he moves around the subject.[49] This implied-but invisible-motion is key to the tension created within Cubist works. This tension was the prime element missing in Duchamp's Nude, and we can assume it was one of the reasons for the unsuccessful reception of the painting. The single plane that the image works upon, and the simplicity of the reading deny the viewer the challenge to decipher and, therefore, *engage with* the motion.

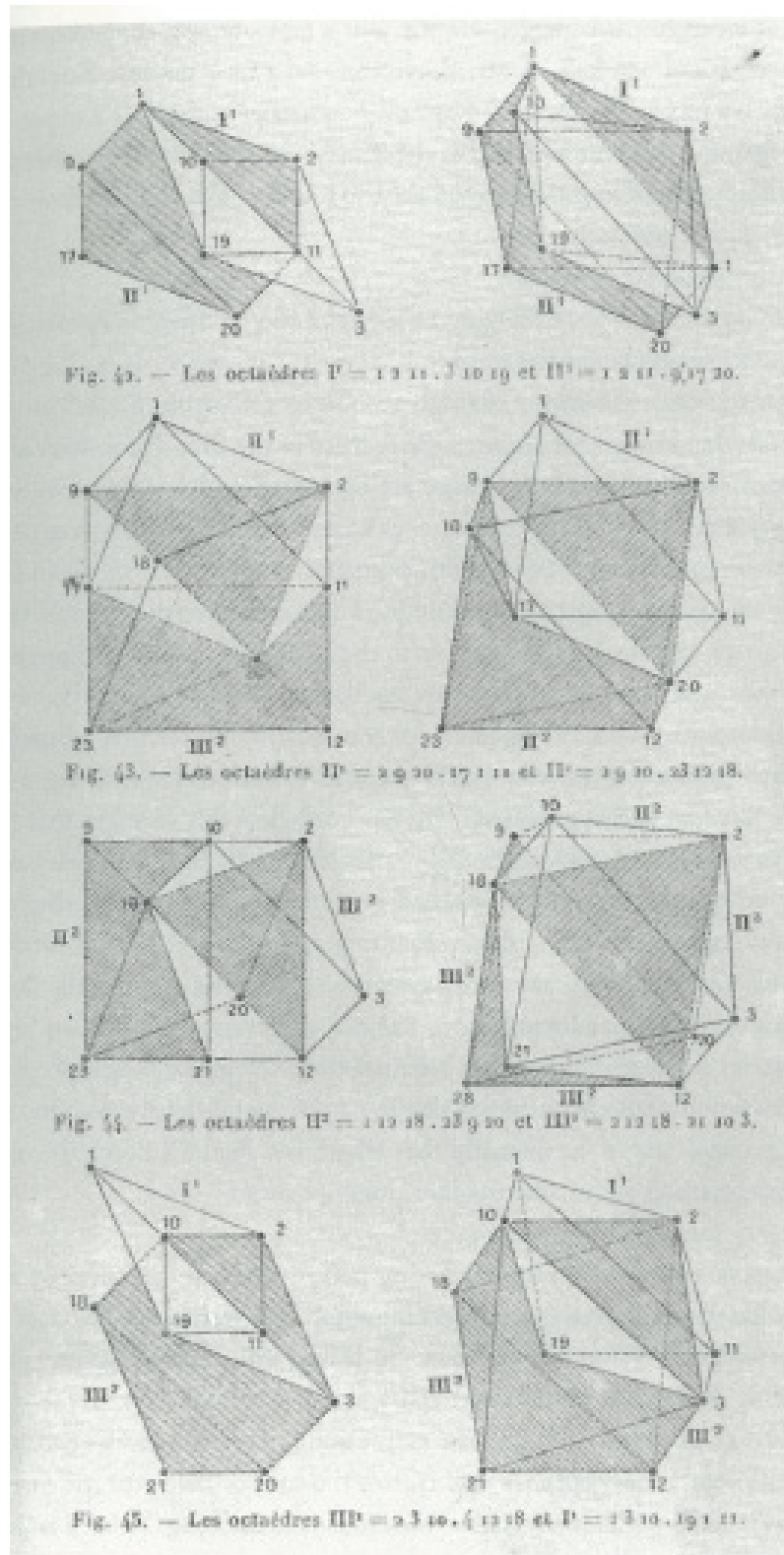'We see not with a single, unmoving eye, but with two active eyes set within a head that also shifts'[50]

Even Duchamp himself believed that the Nude was a flawed representation as it was too static. Consequently his series of 'swift nudes' that followed emphasised speed and fluidity, in order to try and eliminate the inert quality of the previous depiction[51]. In this series the beings in the images became less and less recognisable as figures, until they were just a shadow of the entity that they were based on. The renowned art critic and poet Guillaume Apollinaire wrote extensively about Duchamp during this period and he described these artworks to contain 'traces of beings'. The reduction of form,

Fig. 15 (Opposite) Marcel Duchamp, *Nude Descending a Staircase (No. 2)* 1912. Oil on Canvas, Philadelphia, Philadelphia Museum of Art.

49   Henderson Linda, *The Fourth Dimension and non-Euclidean Geometry in Modern Art*, Princeton, N.J: Princeton University Press, 1983, pg 81, For more about Cubism and optics see Anne Coffin Hansen, 'The Human Eye: A Dimension of Cubism, in Art and Ape of Nature: Essays in Honor of H. W. Janson, pg 739-48

50   Ibid, pg 81

51   Henderson, Linda, *Duchamp in Context: Science and Technology in the Large Glass and related works*, Princeton, N.J: Princeton University Press, 2005, pg 16

Fig. 42. — Les octaèdres I' = 1 2 11 . J 10 19 et III' = 1 2 11 . 9 17 20.

Fig. 43. — Les octaèdres II' = 2 9 20 . 17 1 11 et II' = 2 9 20 . 23 12 18.

Fig. 44. — Les octaèdres II² = 1 12 18 . 23 9 20 et III² = 2 12 18 - 21 10 3.

Fig. 45. — Les octaèdres III' = 2 3 10 . 9 12 18 et I' = 2 3 10 . 19 1 21.

'The shadow cast by a four dimensional figure on our space is a three dimensional shadow.... by analogy with the method which architects depict the plan of each storey of a house a four dimensional figure can be represented by three dimensional sections. These different sections will be bound together by the fourth dimension.'

-Duchamp

Fig. 16   Washington 'Irving' Stringham, *Fourth Dimension Figure Study, Hypersolids.* 1882

and refocusing on pure gesture in Duchamp's work was successful in distilling the fundamental essence of the movement it depicts. However it no longer referenced the fragment as the Cubist language was lost. Duchamp's series of images show how difficult it is to balance fragmentation and movement, in the more legible, faceted depiction the figure loses its spirit of motion, and the more mobile example was done with a free flowing hand but the fragmentation is lost. The challenge for the impending design process will be to mediate between the two and in particular capture the tension crucial to a viewer's engagement.

An Alternative Dimension

During the period that Cubist artists were developing their language, physicists were investigating the possibility of a higher dimension, a fourth dimension. This idea of a higher spatial order resonated with the creation of Cubist art, as it was about the possibility of simultaneous existences of space. These explorations disbanded the absolute belief in the perspectival understanding of space,[52] and instead the artists began to investigate other possibilities for projection.

At the start of the twentieth century not only was there plenty of literature on the topic of the fourth dimension, but many mathematicians had begun to attempt to represent their ideas visually. Most of these early illustrations were depictions of 'hypersolids', traditional three dimensional forms such as cubes and pyramids which were distorted in attempts to visualise these

52   Weston, Dagmar M, "Le Corbusier and the Restorative fragment at the Swiss Pavilion", edited by Mari Hvattum and Christian Hermansen, In *Tracing Modernity: Manifestations of the Modern in Architecture and the City*, London: Routledge, 2004, pg 173

shapes in a four dimensional existence.

French mathematician, Esprit Jouffret, created one of the more sophisticated representations of this concept. His image, *Perspective Cavalière* was often cited in texts upon the subject. The technique which he employed to describe the four dimensional quality of these forms, involved the figures shown frequently turning upon the page. This was an attempt to simultaneously represent multiple vantage points of the object.[53] The fourth dimension quickly transcended scientific depictions, and became representative of the concept of binding simultaneity. Cubist artists identified with these ideas, and comparisons between the scientific illustrations and Cubist art quickly became inevitable as the two displayed so many of the same characteristics. Linda Henderson articulated the relationship between two such illustrations in her book The Fourth Dimension and non-Euclidean geometry in Modern Art:

'In both Picasso's *Portrait of Ambroise Vollard* of 1910 and Jouffret's *perspective cavalière* there is a striking similarity in the triangular facets, which represent a variety of planes and angles seen from different points of view. Further the shading of certain of these facets creates shifting relationships that contribute to a general shimmering quality of iridescence in the diagram as well as in the Picasso painting. Finally, both works exhibit a new kind of space not dependent upon traditional three-dimensional perspective.'[54]

The importance of the Fourth Dimension in this thesis remains within the physicality of the scientific expressions. These depictions pushed Cubism to represent the idea of simultaneity, and provided a language to do so. The 'shifting relationships' which Henderson identifies, is a prime example of the

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53   Henderson, Linda, *The Fourth Dimension and non-Euclidean Geometry in Modern Art*, Princeton, N.J: Princeton University Press, 1983 pg 57

54   Ibid. pg 58 Many other art historians, such as Christopher Gray and Winthrop O. Judkins have used the term 'iridescence' to describe the 'ambiguity of form both two-dimensional and spatial.'
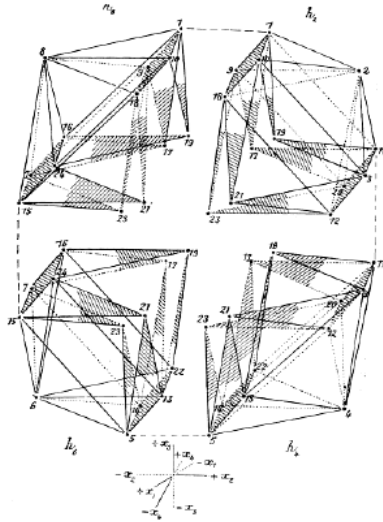
Fig. 18 Esprit Jouffret, *Perspective Cavalière,*
1903

Fig. 17 (opposite) Pablo Picasso, *Portrait
of Ambroise Vollard,* 1910, Oil on Canvas,
Pushkin Museum, Moscow

successful inclusion of tension to drive the experience of the viewer. This
quality is equally important to the parallel strands of study; fragmentation
and the dynamic body, and can be a common ground that each identifies
with.

The work of Marey, Duchamp, Picasso and Jouffret will all be further
examined for their techniques, as the drawing portion of the design process
commences. Representation will become experimentation as the language
of these exemplars is pulled apart and reinterpreted, to not only fragment
the body, in a positive manner, but also depict its movement.
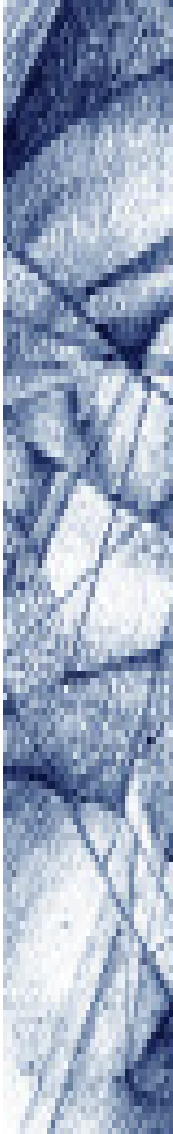
Translation

' Paradoxically, the fragmentation and temporalisation of space initiated by film montage and modernist collage that opened up a truly infinite realm of poetic places for the human imagination still await their translation into architecture.'[55]

The translation of drawing to space is always going to pose challenges. The techniques and tools used will have an effect on the outcome, to a degree we can control this effect but much of it will just be inherent within the process. Drawing as a medium to explore the body was a conscious decision, resulting from the yearning for physical contact with the construction of the image. The result of using this technique means that the crafted nature of the drawings carries through these qualities into the architecture.

The aim of this thesis is to pass bodily movement through a representational abstraction, into a form which can infiltrate the built environment. Therefore

55   Perez, Gomez, "Questions of Representation", Edited by Marco Frascari, Jonathon Hale and Bradley Starkey, In *From Models to Drawings: Imagination and Representation in Architecture*, New York: Routledge, 2007, pg 11

the next phase of this research is to investigate the transferral of two dimensional representations of motion into three dimensional space. This stage, termed simply 'space making' looks at parallels between Cubism and architecture in history to determine strategies for the successful translation.

Pass On the Movement

'The real question is *how to pass the movement on,* from the machine to the architecture, from the architecture to the body, and from the body back to the machine'.

- Spuybroek

Many contemporary architects are interested in the use of the dynamic body, but few appear to consider the need for an abstraction method when taking the motion into architecture. Dutch architect, Lars Spuybroek, is concerned with the movement of the human form, and how this can influence his making of architecture. For Spuybroek space and movement exist in equilibrium, one balancing the existence of the other, therefore he believes that bodily movement must be considered when creating spaces for today.[56] The 'machine' which Spuybroek mentions in the accompanying quote is referring to the combination of techniques and processes which Spuybroek employs in order to create his architecture.

Although Spuybroek believes in the use of the body as a generator, he knows that the repetition of creating anthropomorphic architecture from bodily movement is not viable. A new form of projection, or new processes to apply projection, need to be employed in order to translate the ephemeral quality of motion to architecture.[57]
Spuybroek looks to digital processes, and has created a computer generated formula to inform his translation, often resulting in a poetic solution but, it

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56   Spuybroek, Lars, *The Architecture of Continuity,* Rotterdam: V2_Publishing, 2008, pg 53

57   Spuybroek, Lars, *The Architecture of Continuity,* Rotterdam: V2_Publishing, 2008, pg 56

could be argued that the digital technique has exerted an almost too perfect control on the result. The use of an analogue means of projection in this thesis reflects and celebrates the imperfection of the body.

Shallow vs. Deep Space

'Transparency means a simultaneous perception of different spatial locations. Space not only recedes but fluctuates in continuous activity.'[58]

As established in the previous chapter the genesis of cubism, 'the explosive reformulation of pictorial space'[59], was revolutionary in terms of our understanding of depth. The explicit spatial upheaval which the Cubists were working to activate would of course have a profound effect on the space making of architects. The 'dissolution of the perspectival understanding of space'[60] had become an artistic endeavour undertaken to try and represent the 'true' or direct experience of an object or space. When transitioning these qualities into three dimensional realities however, these devices can lose their potency.

Fortunately few architects did achieve a resemblance. Sigfried Giedion articulated this transition from canvas to drawing board in his book *Space, Time and Architecture*, first written in 1941. He concluded that examples
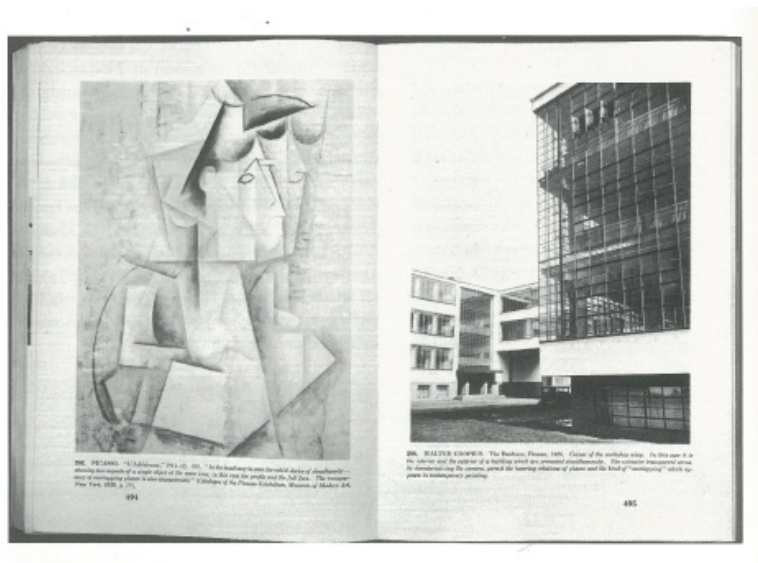
The pages from Giedion's book in which he compares Picasso's work with Walter Gropius' Bauhaus building .

58   Kepes ,Gyorgy, Quoted in Rowe, Colin, *The Mathematics of the Ideal Villa and other essays,* MIT Press, Cambridge, Massachusetts, 1976, pg 161

59   Evans, Robin, *The Projective Cast*: *architecture and its three geometries*, Cambridge, Mass: MIT Press, 1995, pg 55

60   Weston, Dagmar M, "Le Corbusier and the Restorative fragment at the Swiss Pavilion", edited by Mari Hvattum and Christian Hermansen, In *Tracing Modernity: Manifestations of the Modern in Architecture and the City*, London: Routledge, 2004, pg 173
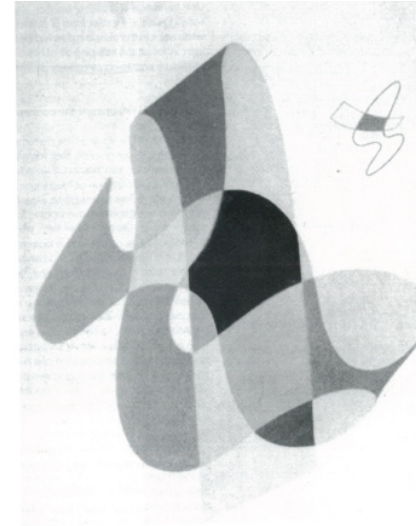
Fig. 20 (opposite) *Pages from Space, Time and Architecture*, by Sigfired Guidion.

Fig. 19 Clifford Eitel (Student of Gyorgy Kepes), *Study of Transparency.*

in Cubist art and architecture appear to share three key characteristics: planarity, transparency and simultaneity.[61] He believed that each discipline arrived at these results through slightly different drivers. The artists wanted to reconquer the plane surface, the architects influence however was a consequence of the 'demand for mortality'.[62] Although Giedion had sound logic behind his juxtaposition, the examples he used to illustrate his point were chosen selectively. The Bauhaus example is thoroughly unfragmented, as though Gieidon was trying to suppress this uncouth quality and segregate it to art.

Colin Rowe, the architectural historian, followed Sigfried Giedion's assertions, and in 1955 collaborated with Robert Slutzky to provide his own commentary on Cubism. He identified with some of Giedion's terms but felt he could provide a more coherent argument by dissecting the characteristic of transparency. Rowe cites Moholy-Nagy in his discussion of the genesis

61   Evans, Robin, *The Projective Cast*: *architecture and its three geometries*, Cambridge, Mass: MIT Press, 1995, pg 57

62   Giedion, Sigfried, *Space Time and Architecture: the growth of a new tradition*, Cambridge: Harvard University Press, 1967 pg 433

of cubist art, as he argues that the overlap of form is a central characteristic of this style. Moholy-Nagy believes this artistic technique has the ability to 'overcome space and time fixations. They transpose insignificant singularities into meaningful complexities... The transparent quality of the superimposition often suggests transparency of context as well, revealing unnoticed structural qualities in the object.'[63] Space is reassembled, and a figures relationship to space redefined when overlapping is employed as a representational device. A depth is implied and the figures 'endowed with transparency'[64]. New entities are created from the superimposition, and the birth of these forms intensifies relations between the original objects.[65] The fragmented depiction which usually results from this treatment builds a dialogue between the part and whole because both are experienced by the viewer.

'Le Corbusier thoroughly laundered cubism in his paintings before successfully creating a comparable, but not identical, sense of interleaving spaces and planes in his architecture.'[66]

63   Rowe, Colin, *The Mathematics of the Ideal Villa and other essays,* Cambridge, Mass: MIT Press, 1976, pg 161

64   Kepes, Gyorgy, quoted in Anne-Catrin, Schultz,*Carlo Scarpa: Layers,* Edition Stuttgart: Axel Menges, 2007, pg 14

65   Arnheim,Rudolf, quoted in Anne-Catrin, Schultz,*Carlo Scarpa: Layers,* Stuttgart: Edition Axel Menges, 2007, pg 14. Arnheim describes the new relationship as a "correlation", or an exchange of energy between entities as the reciprocally modify one another.

66   Evans, Robin, *The Projective Cast*: *architecture and its three geometries*, Cambridge, Mass: MIT Press, 1995, pg 67
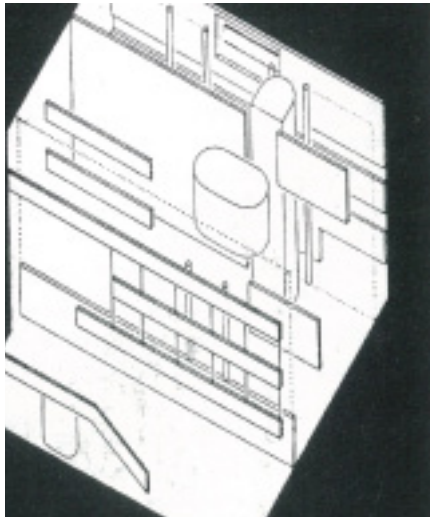
The Villa at Garches

Fig. 21 Colin Rowe, Robert Slutzky, *Transparency Analysis of the Villa Garches, interior*

The Villa demonstrates phenomenal transparency, 'an inherent quality of organisation'

-*Architecture and Cubism* p. 3

In Rowe and Slutzky's essay, *Transparency: Literal and Phenomenal,* they discuss the differing use of transparency in Cubist art. They believe there are two distinctly different ways which this quality is employed in Cubist works, and distinguish between these with the expressions literal and phenomenal transparency. While literal transparency is somewhat self explanatory, referring to the 'trompe l'oeil effect of a translucent object in deep naturalistic space'[67], phenomenal transparency is more complex, particularly when identifying it in architecture. Phenomenal transparency is created usually from the overlapping of figures, as described in the section above, but it is through the *experience* of this phenomenon that it is strongest. Phenomenal transparency relies on a shallow understanding of the space viewed, if it is in architecture it will be a series of shallow spaces overlaid. This occurrence of a succession of planar experiences is never stronger then at Le Corbusier's Villa at Garches. It is through the study of this building that an understanding of Cubism's true potential for architecture lies.

Cubism was never a theme which Le Corbusier formally stated as an influence of his work, yet the legacy of the movement is obvious in the controlled building of spaces and planes.

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67   Rowe, Colin, *The Mathematics of the Ideal Villa and other essays,* Cambridge, Mass: MIT Press, 1976, pg 166

'Each of these planes is incomplete in itself or perhaps even fragmentary; yet it is with these parallel planes as points of reference that the facade is organized, and the implication of all is of a vertical, layerlike stratification of the interior space of the building, a succession of laterally extended spaces travelling one behind the other.'[68]

Fig. 22 Le Corbusier, *Villa at Garches Front Elevation.* Photographer Unknown

Within the facade of the villa, tension has been used to characterise the stiffened surfaces. Le Corbusier exploits the planar qualities of glass and places his bands of glazing so they appear to 'hover' independent from the facade, within the interior.[69] The horizontality of the unrelenting glass strips implies a secondary slot of space behind the facade. This plane, although it is not physical, has the same impact as the real planes.[70] The facade is just the first experience you read as approaching the building but the characteristic of phenomenal transparency travels further within the building, and weaves its way through the composition of space.

Mary Mcleod's more recent essay of 2005 re-examines the work of Le Corbusier from her chronologically more removed perspective. Interestingly she reaches a very similar conclusion to Rowe. She believes that the layering of spaces within Le Corbusier's plans is a radical kind of fragmentation.[71] This three-dimensional montage of volumes, rejects chaos, but embraces

68   Rowe, Colin, *The Mathematics of the Ideal Villa and other essays,* Cambridge, Mass: MIT Press, 1976, pg 167

69   Ibid. pg 166

70   Ibid.

71   Mcleod, Mary, "'Order in the details', 'tumult in the whole'?: composition and fragmentation in Le Corbusier's architecture". In *Fragments: architecture and the unfinished : essays presented to Robin Middleton*, edited by Barry Bergdoll with Werner Oechslin, London: Thames and Hudson, 2006 pg 304

complexity and the manipulation of the viewer.[72] In Mcleod's essay she makes the reader aware of the vital contradictions which are surprisingly crucial to the success of Le Corbusier's work. Ultimately composition and fragmentation, both found within the Villa at Garches, consist of opposing values, but she argues that the way that Le Corbusier juxtaposes these paradoxes -with varying degrees of subtlety- elevates his work above all other attempts to 'three dimensionalise' Cubism.

Both Dalibor Vesely and Colin Rowe believe that Le Corbusier was the first architect to use the fragment in his work in an attempt to realise a 'positive vision'[73]. Vesely recognises Rowe's term phenomenal transparency as 'a result of the overlapping of figures or elements, as a simultaneous perception of elements in various spatial locations' and therefore just 'a different name for the role of the fragment'[74].

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72   Mcleod, Mary, "'Order in the details', 'tumult in the whole'?: composition and fragmentation in Le Corbusier's architecture". In *Fragments: architecture and the unfinished: essays presented to Robin Middleton*, edited by Barry Bergdoll with Werner Oechslin, London: Thames and Hudson, 2006 pg 307

73   Vesely, Dalibor, *Architecture in the Age of Divided Representation: the question of creativity in the shadow of production*, Cambridge, Mass: MIT Press, 2004 pg 344

74   Ibid.

The use of a Cubist drawing technique does not come without risk. The Cubist style is so well established that it is often hard to break away from its aesthetic and concentrate on its underlying attributes. It is important to note that this thesis does not attempt to fold the Cubist language into architecture. That was already achieved in the *Maison Cubiste,* which was 'generally derided as a facile attempt to simulate the appearance of cubist shapes in architectural details.'[75] The house was a token response of the application of an aesthetic style, the building ignored the driving forces behind the images of the Cubists. By looking at Le Corbusier's much more sophisticated response it is hoped that his method, and the accompanying texts, can aid the translation from Cubist styled images to movement imbued architecture.

The last part of the design sequence, before commencing with architectural design, will be to deal with the dialogue which needs to be fostered between part and whole. The next chapter looks at techniques to negotiate this last passage of transition in order to ensure that the underlying qualities of Cubism are captured in the final architectural expression.

75   Evans, Robin, *The Projective Cast*: *architecture and its three geometries,* Cambridge, Mass: MIT Press, 1995, pg 65

Mediating Part and Whole

'...well known architects have engaged the dark space 'between' dimensions in a work that privileges the *process* and is confident of the ability of the architects to 'discover', through embodied work, significant tactics for the production of a compassionate architecture.'[76]

A design process often evolves by moving in and out of a series of phases, sometimes lingering within a stage, often revisiting past moments. One aspect of this process which is often neglected is the transition between the different periods. The decisions which cultivate the process to move through the stages are often integral to the end result, but because they occupy these in between zones, they are rarely documented.

By breaking down the process and focussing on the shifts it is hoped that decisions will better foster the transitional period, and therefore the ephemeral qualities captured in early stages will be carried into the architecture. The last part of the design process, where the architectural result rises to fruition, can be the most trying portion as it is here that underlying themes are often lost. A supporting framework will be integral in structuring this transition

76   Perez, Gomez, "Questions of Representation" Edited by Marco Frascari and Jonathon Hale and Bradley Starkey, *From Models to Drawings: Imagination and Representation in Architecture*, London: Routledge, 2007, pg 22

and allowing the desired qualities, such as bodily motion, to transcend the process.

Carlo Scarpa was masterful in the way he translated his themes from idea to architectural reality. His process involved a duality of the part and whole which exists simultaneously on his drawing board. The 'parts', which he used as a key component of his conversion from concept to product, from vision to actuality, have been termed here as 'architectural fragments'. Their role in the design process will be analysed, and their ability to encourage an enriched architecture will be spotlighted.

Process as Project

'Architectural conception and constructions consist of multi-layered fragmentary processes of realisation' [77]

The importance that a drawing process can have in advancing architectural design has not always been expressed within architectural texts, as usually the pragmatic problems of programme outweigh the integration of thematic generators into our work. Even when this is discussed it is not often in reference to the physicality or techniques which form drawings, and how these methods advance the mode of architectural genesis.
Stan Allen writes about the role of architectural drawing or representation and its status within a project. He states that 'the means of representation are never neutral, never without their own shadows.'[78] This statement is

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77   El-Bizri, Nadar, " Imagination and Architecture Representations" Edited by Marco Frascari and Jonathon Hale and Bradley Starkey, In *From Models to Drawings: Imagination and Representation in Architecture*, London: Routledge, 2007, pg 22

78   Allen, Stan. *Practice: Architecture, Technique and Representation* 2nd edition. Abingdon: Routledge, 2009, pg 7

even more poignant if the process actually intends to capture the essence within that ephemeral 'shadow of representation' and turn the focus upon it. In the example of this design thesis the representation is certainly not neutral; it is the driver, the process and the theme. The usual innocence of the architecture to its creation techniques[79] does not apply.

Building the Drawing

'Rather than resulting from the gaze aimed at it, the drawing summons insight by allowing the invisible to saturate the visible.'[80]

Immaterial or intangible qualities in architecture often go unrecognised. Without physical presence immaterial architecture does not command notice. However it is often the immaterial, the idea or the subject, which elevates good architecture from the rest of the built environment.[81] Drawing is crucial to create the relationship between subject and substance. It is within drawing that intangible characteristics (such as the quality of motion, as discussed in the second chapter) can first reside, and through a strong methodology they can flow into the experience of a building.

The exchange between drawing and immaterial subject is developed by Jonathon Hill in his essay, *Building the Drawing*. He describes his method 'Drawing as Analogue';

'...the drawing as analogue allows more subtle relations- of technique, material and

79   Agrest Diana, & Allen, Stan, *Practice: architecture, technique and representation*, Marston:G+B Arts International, 2000 pg 30

80   Frascari, Marco "A reflection on paper and its virtues within the material and invisible factures of architecture", Edited by Marco Frascari and Jonathon Hale and Bradley Starkey,*From Models to Drawings: Imagination and Representation in Architecture*, London: Routledge, 2007, pg 7

81   Hill, Jonathon, "Building the Drawing", edited by Bob Shiel in *Design through Making*, Chichester : Wiley, 2005 pg 14
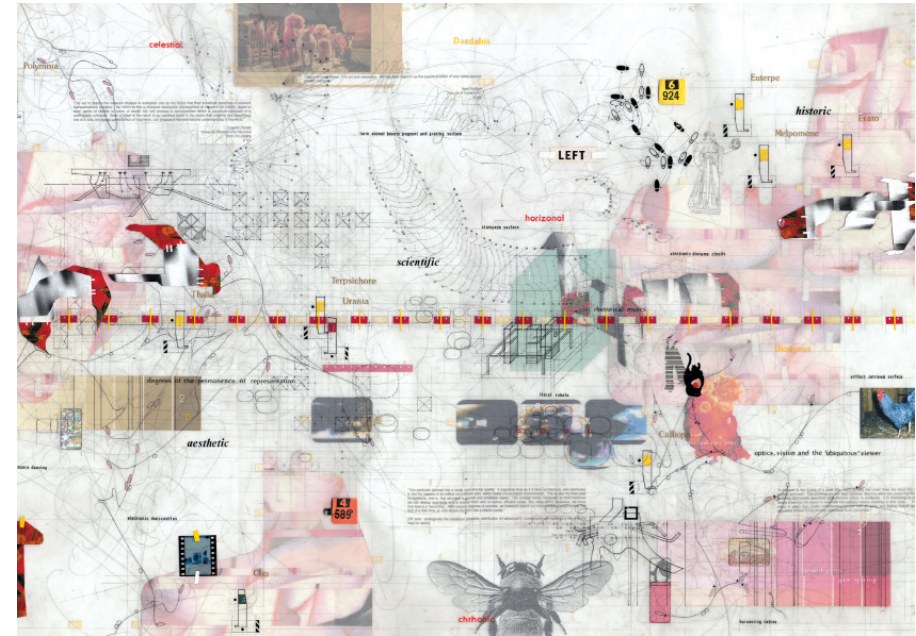
Fig. 23 Perry Kulper, *The Central California History Museum Competition Entry*, Mixed Media

process- to develop between drawing and building. A dialogue can exist between what is designed and how it is designed, between design intention and working medium, between thought action and object- building the drawing rather than drawing the building.'[82]

A 'built' drawing implies the presence of physical construction within the work;[83] a drawing which takes form through a multitude of layers. Perry Kulper is an American architectural professor, who is attempting to filter some magic into his work by means of an imaginative drawing process. His enchanting conceptual drawings not only represent his architectural ideas, but they also stand alone as artworks upon their completion.

Kulper's drawings are fragmentary; they recall surrealist artworks as they

82   Hill, Jonathon, "Building the Drawing", edited by Bob Shiel in *Design through Making*, Chichester : Wiley, 2005 pg 17

83   Ibid.

exhibit floating pieces, ideas, tugged together onto one page. The collages that result are unique; the compositions create relationships between objects which have not been envisioned before. It is the latent content which enters into more interesting and complex interactions,[84] and it is from here that projects are often formed.

The drawing shown here plots the thematic content of a museum, through the drawing technique the aesthetic, scientific, and cultural elements of objects can be explored. There are moments within the image that transcend the next stage of design. These 'proto-architectural elements',[85] move through the design process as Kulper converts them from simply being marks on a page to spatial and material conditions. The projects have not developed enough into the built stage to assess their success as architecture, however the whimsical spatiality created in the drawing has the potential to become evocative architecture.

Learning from Scarpa

'Scarpa's drawings are not static images; they are dynamic demonstrations of an act of projection...'[86]

Carlo Scarpa's developmental drawing, created for Castelvecchio, exhibits all too well the layering of ideas, physical and theoretical. The rich ochre's and brown's within the image reflect his chosen mediums, card and butterpaper, which build up the drawing. The card layer was reserved for more definite decisions and pre-existing conditions, whereas the more unsubstantial stratum of the tracing paper records quick thoughts and trials. The drawings

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84   Kulper, Perry, " Swap Meets, Analogs, and Scanning Flower Edges", Georgia Institute of Technology, November 2009

85   Ibid.

86   Frascari, Marco, "The Body and Architecture in the Drawings of Carlo Scarpa", *Res,* Autumn, no.14, 1987 pg 125
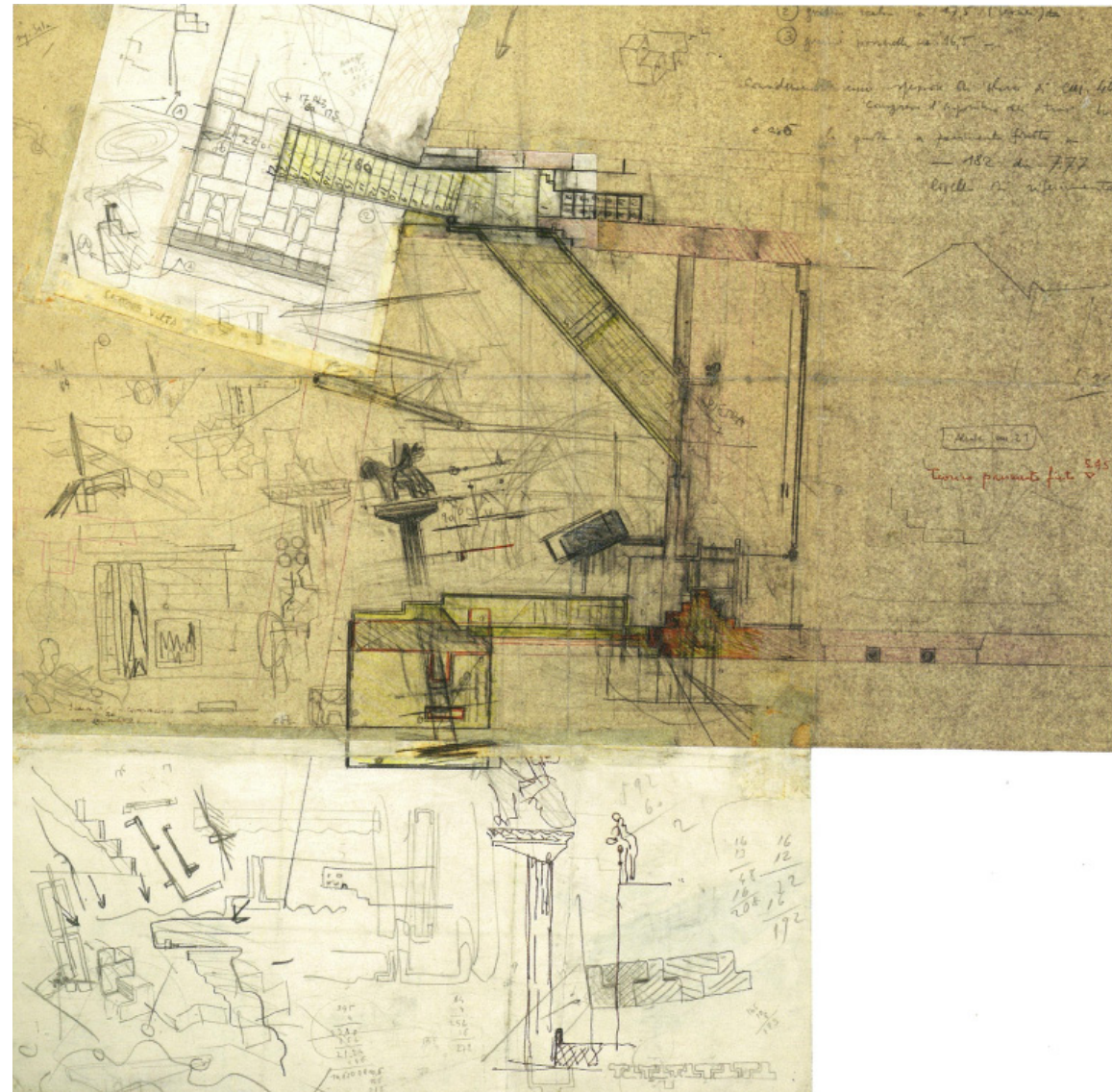
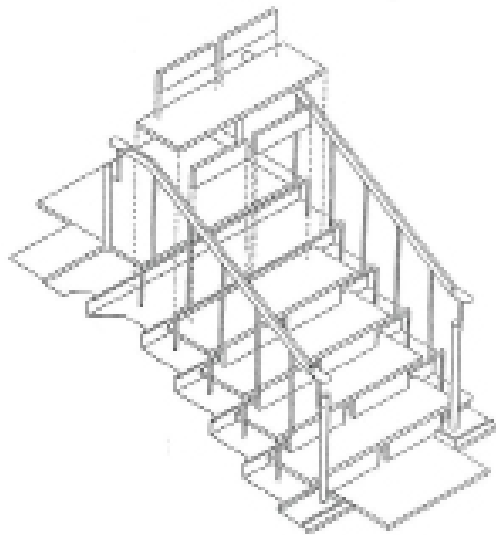Fig. 24 Carlo Scarpa, *Working drawing for Castlevecchio,* c1955

Fig. 25 Richard Murphy, *Analysis of Scarpa's Library Steps: Querini-Stampalia Foundation,* 1993

This staircase is a typical detail from Scarpa. He has simply applied new layers of materials over an existing staircase. He has composed these materials so they allow glimpses of the original structure, simultaneous referring to the old and the new.

Scarpa produces, as captivating as they might appear, are no more than an element in Scarpa's process, a testament to his production method.[87]

Often Scarpa was commissioned to rework an existing building, it was here which Scarpa excelled. He intuitively knew where his interventions would successfully meld with the existing built fabric, and the layering of his architectural response echoes his drawing technique so completely it was as though the architecture had leapt from the page. Castelvecchio was a historically laden project, the building had undergone a series of transformations before Scarpa overlaid his sediment. Scarpa interpreted the history of this building as fragmented[88] and his drawing explorations echoed the stratums of time within the building.

The dialogue which Scarpa developed between fragment and whole may be explained by an exploration of his methods. The adjacent placing of these conditions in his process meant the influence of one on another was not only inevitable, it was fostered. However, many of the investigative texts on Scarpa fail to explain how within this process he managed to fold his themes and motifs into his work. One theorist who does attempt to delve deeper is Anne-Catrin Schultz. In her text *Carlo Scarpa-Layers* she writes:

'The fitting together of elements begins with abstracting the individual parts; at the end of the process a system of references is created that is not only limited to material and form, but communicates as an inseparable whole and may include reminiscences of artistic or architectural themes.'[89]

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87   Zambonini, Giuseppe "Process and Theme in the Work of Carlo Scarpa," *Perspecta* 1983, no.20, pg 22

88   Schultz, Anne-Catrin, *Carlo Scarpa: Layers,* Stuttgart: Edition Axel Menges, 2007, pg 78

89   Ibid. pg 16

Schultz views Scarpa's work as 'stratified'[90]. The most important element of his process and, therefore architecture, she argues is the overlapping of layers within which the complexity of material, method and theme can happily co-exist.

Schultz goes as far as to recall the texts of Kepes, and Rowe and Slutzky in order to explain the magnitude of an overlapping or layering process. Simultaneity and transparency are undoubtedly observed within Scarpa's work,[91] as a physical construct and a theoretical condition. Because of the presence of these factors, Scarpa's work can be viewed as a continuation of the ideas that Corbusier, and the Cubists dealt with.

Castelvecchio can be viewed as an ideal case study for the way Scarpa integrates not only the new and the old, but also the part and the whole. The architectural design portion of this thesis will look to appropriate some of his methods to create an architecture which can reflect the themes of the Cubists through many scales of the design.

Architectural Fragments

The term 'architectural fragment' is often supposed to mean a relic of architecture, a piece of a building that has been broken or left over from its whole. The definition of anything as fragmented denotes something broken, and 'as soon as we identify something as broken, we become detectives of

90   Schultz, Anne-Catrin, *Carlo Scarpa: Layers,* Stuttgart:Edition Axel Menges, 2007, pg 15

91   Goffi- Hamilton, Federica "Scarpa and Eternal Canvas of Silence" *Arq: architectural research quarterly* 2006, v.10, n.3-4, pg 294

its history'.[92] The fragment can be perceived as a memento of melancholy and nostalgia, a reminder of the past, but it can also have a double meaning, simultaneously it presents a possibility of the future, of a utopian whole.[93] The first meaning of the fragment is in this thesis assumed, but the second is recognised for its potential and integrated into the fabric of the method.

An architectural fragment is a portion of a whole, - in which the whole effortlessly exists- not just a physical construct but a phenomenal entity. The architectural fragment becomes a tool for translation, a way to negotiate the 'dark spaces'[94] within the process. It is the mediating body which glides between concept and creation, and infiltrates the project in a variety of scales.

Part to Whole

Carlo Scarpa's use of the vesica picis, is an example of an architectural fragment. The symbol has dualistic meanings, some of them fundamental polarities, such as woman/man, water/earth but other more specific to his understanding of the encompassing theory of a project, such as universal/empirical, unchanging/changing.[95]

These two interpenetrating circles exist in Scarpa's work physically at many

92   Evans Robin, *The Projective Cast: Architecture and its Three Geometries,* Cambridge, Mass: MIT Press, pg56

93   Vidler, Anthony. *Warped space : art, architecture, and anxiety in modern culture.* Cambridge, Mass.: MIT Press, 2000. pg 151

94   Perez, Gomez, Frascari, Marco eds. *From Models to Drawings,* Routledge, London, 2007,pg 22 As referred to in the first quote at the beginning of the chapter.

95   Frampton, Kenneth, "Notes on the Fragmentary Architecture of Carlo Scarpa" *Bergdoll, Barry & Oechslin, Werner, Fragments: architecture and the unfinished : essays presented to Robin Middleton,* London: Thames and Hudson, 2006 pg 368

scales, the most famous example as a door sized penetration within a wall. However the underlying symbolism also permeates his projects, and the icon becomes a 'shibboleth' within Scarpa's schemes.[96]

'He would reverse the process, attacking with ferocious inventiveness and extraordinary tension over each and every detail... in the certainty that from their dialogue and interlacement it would spontaneously spring the message of the whole.'[97]
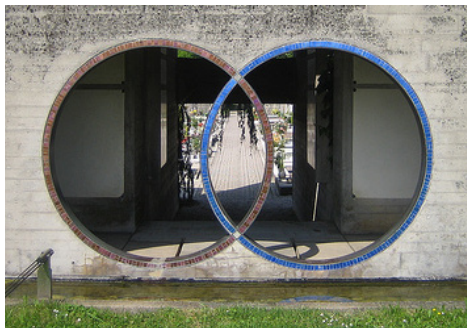

Fig. 26 Carlo Scarpa *The Vesica Picis at Brion Cemetery.* Photographer Unknown.

Scarpa's architectural responses always bring together a collection of fragments. A lazy criticism of Scarpa is that his fragments are too abundant, and dazzle the viewer, not allowing the comprehension of the whole scheme.

In some of Scarpa's early work this criticism may have been somewhat justified, but his more mature schemes cleverly interweave these moments, to build a palimpsest of information in an 'unfolding progression'[98] Fortunately Scarpa used Corbusiers architecture for guidance and this stimulus was fundamental to the success of his later work. Corbusier's influence 'contributed to developing Scarpa's attention to the external volume of a building as a whole, counteracting a tendency to fragmentation, a trait integral to his poetic feeling.'[99]

96   Ibid. pg 368

97   Zevi in Zambonini, Giuseppe "Process and Theme in the Work of Carlo Scarpa," *Perspecta* 1983, no.20, pg 26

98   Frampton, Kenneth, "Notes on the Fragmentary Architecture of Carlo Scarpa" *Bergdoll, Barry & Oechslin, Werner, Fragments: architecture and the unfinished : essays presented to Robin Middleton,* London: Thames and Hudson, 2006 pg 383

99   Crippa, M.A. *Carlo Scarpa- Theory, Design, Projects,* MIT Press, Cambridge, Mass. 1986 pg 32

This thesis will look at using a process similar to the one which Scarpa set out, in order to allow the underlying principles of Cubism to permeate the project. The qualities identified in the last chapter as being integral to both Cubist images and architecture are planarity, phenomenal transparency and simultaneity. Like Scarpa's vesica picis they will be integrated into the architecture as both phenomenal and physical conditions.

As a project moves through an architectural process it gains complexity. The 'architectural fragment' proposed here is a conceptual driver which will help negotiate the design process. This idea needs to be defined from the 'bodily fragments' which will be generated through the fragmentation of dynamic bodily representation.

Like a Cubist artwork the resulting architecture will require a tension which is generated from the dialogue between the parts and the whole. If this is achieved it is hoped that the buildings language will reflect that feeling of flux, or movement, from which it has been created.
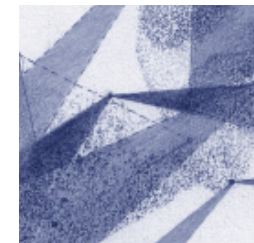
Negotiating the Architecture

This thesis was conceived of as a series of stages, a method for the conversion of the dynamic body into architecture. It was imperative that the process moved through the realms of representation, and a procedure of abstraction occur, this was recognised as necessary in avoiding an anthropomorphic result. However this was a loose criteria, which needed further honing to create a coherent result. The outcome needed to be contemporary and relevant, and the study of the positive fragment and the dynamic body came as a reaction to this desire.

As established in Chapter One the human body has been used as an early part of architectural processes before, and successfully translated into architecture. Usually the conversion from the drawing of the body to architectural drawings is done through logical means, by applying the forms of the body, or proportions of our stature to the makeup of a building. The focus of this method is to attempt to translate the body in a more "illogical" manner, where the invisible or unquantifiable aspects of the body in motion are released. Although these immaterial attributes are not typically

movement → drawing → space making → architectural fragments

architecture ← programme
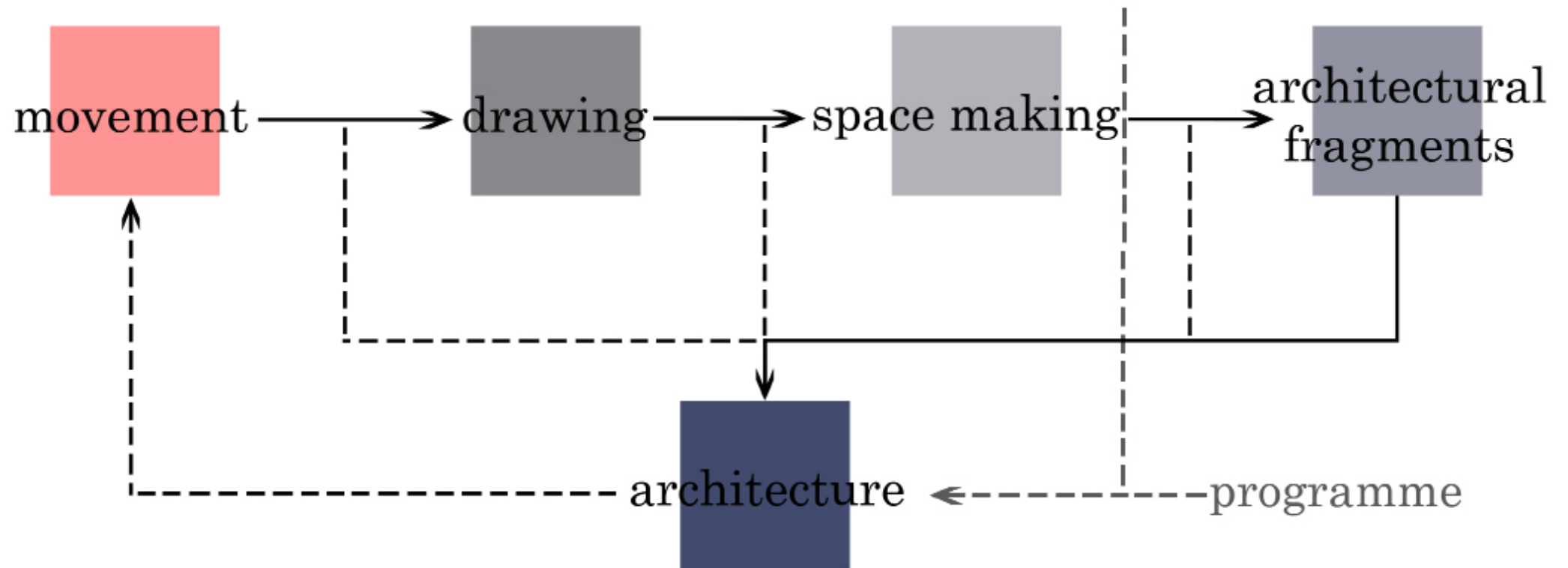
recognised as being as influential within the drawing process[100] their importance cannot be understated here.

MOVEMENT

The preliminary subject of this study was the gymnast. This subject was chosen as it is an example of the human body in performance. The gymnast searches for aesthetic perfection as they move through a series of motions which are designed to test the capabilities of our bodies in terms of flexibility, strength and grace.

Following on from the methods devised by Etienne-Jules Marey, the motion of these athletes was recorded digitally, and stills were taken from the recording. The bodily motion captured in these stills was overlaid, so it occupied the single space in which it was first recorded. These images were created so they resembled a simplistic counterpart of Marey's ghostly depictions. The images were stripped of their surrounds so the space became neutral, the body and its interaction was now the only relationship of importance.

100   Hill, Jonathon, 'Building the Drawing' In *Design through Making*, Vol. 75, No. 4 Chichester : Wiley (2005) pg 14

Fig. 28 (Above) *Photographic Series of Gymnast on Balance Beam*, June 2010, Photos by Author

Fig. 29 (Left) *Backwards Walkover Overlaid,* June 2010, Created by Author

DRAWING

'Drawings are among the ephemeral products of the visual arts... their reduced materiality possesses a force which drives the imagination'[101]

The design process undertaken lingered within this drawing stage. This phase was critical -and the approach to it was rigorous- as the results from these drawings passed on through the rest of the process. As earlier suggested by Massey's reading of Deleuze and Guatarri, representation became experimentation. The movement images were converted, via acetone rub onto heavy boards, and here the distilling of the 'motion essence' began. Pencil drawings were built up, overlaying the translucent base of the transferred image. Each of the bodily interpretations was recorded as an experiment and judged on its success. (refer Appendix 1) The images created throughout this study are lively expressions, frolicking across the boards which they occupy, carving out space which was then captured and translated.

The earliest images created show Marey's continued influence over the method. Marey's goal was to observe the human body as an 'animate machine', and therefore he had to remove the presence of flesh and volume, leaving behind the impression of a moving skeleton. To achieve this he 'clothed his subjects in black, marked their joints with shiny buttons, and connected the buttons with metal bands'.[102]

The initial drawing technique was appropriated from these photographs.

'I want to see, therefore I draw. I can only see an image if I draw it.' – Scarpa
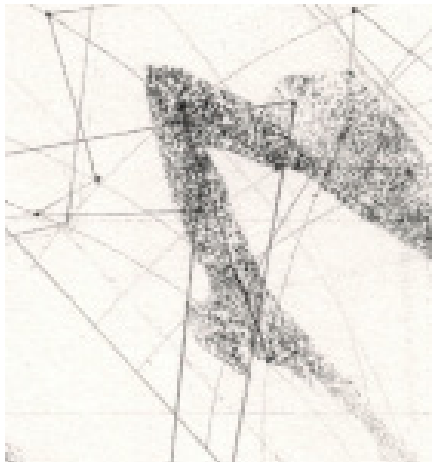
Fig. 30 Detail of *Experimental Image 3,* Created by Author. Pencil and Acetone Rub

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101   Bredekamp, Horst, 'Frank Gehry and the Art of Drawing' In *Gehry Draws*, edited by Mark Rappolt and Robert Violette, Cambridge, Mass. : MIT Press in association with Violette Editions, 2004 pg 24

102   Braun, Marta, *Picturing Time: the work of Etienne-Jules Marey (1840-1904)*, Chicago : The University of Chicago Press, 1992, pg 81

The procedure is to map the positions of joints upon the body, and then trace lines from point to point creating a web of movement reminiscent of Marey's. These depictions were beautiful studies, but needed the next layer of information; fragmentation, to contemporize, and truly imbue a sense of movement not only across the page but into the page.

'We have seen that the portrayal of an object in its totality requires the destruction of its pictures unity; conversely, the destruction of a picture's unity may, by inference, magic, or shared intuition, create the sense of a probable totality beyond the picture, and this is what the cubists believed they could achieve with their kaleidoscopic compositions.'[103]

'Architectural drawing is... wholly based on an awareness of givenness and on a materialisation of fluid invisible thoughts... Drawing is thus a 'shower of gifts' and this complex showering is the reality of architecture, understood graphically.

-Frascari

In order to truly represent the movement of the body in its entirety the photographic stills of the motion had to be broken down. Cubism was, of course, chosen as the vehicle of translation. The expressions which were created in this next phase responded to critiques of Duchamp's *Nude Descending a Staircase.* Cubist commentators believed that in this image the movement stopped at the canvas edge, and therefore it did not invite the viewer to participate. To counteract this occurring in these attempts the 'fourth dimension' or simultaneity was engaged. Espirit Jouffret's physical expression of the concept, the *perspective cavalière* was used as a framework. As the drawing process was being explored attention was given not only to the form of the compositions, but also to the rendering techniques which constructed the images. The use of the pencil and the tonal qualities achieved through this medium slowly evolved during this phase. The catalyst for the changes made here was the statement of Linda Henderson's, where she describes one of Picasso's paintings as possessing an 'iridescent' quality. Although the term iridescent technically refers to a colour changing phenomenon the spirit of the expression was sought, and blocks of tone

103   Evans Robin, *The Projective Cast: Architecture and its Three Geometries*, Cambridge, Mass: MIT Press, pg 63
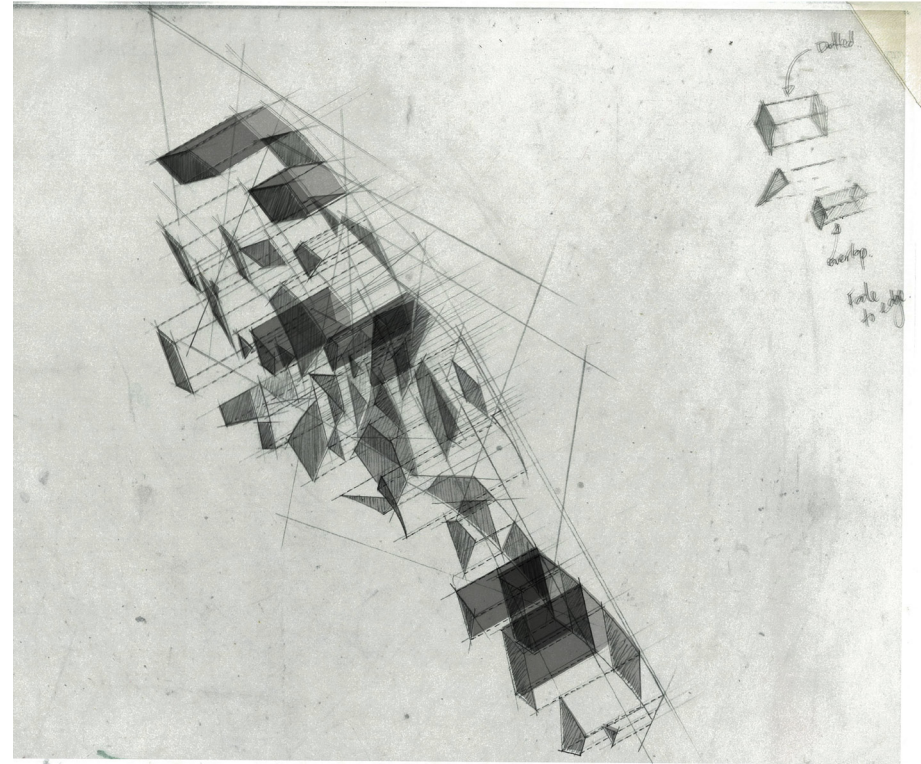
SPACE MAKING

built up to resemble the shimmering quality of the phenomena.

The space making stage was one of the most complex portions of the method. This was the transition zone which needed to 'pass the movement on'[104] into a form which could develop into architecture. This obviously involved the transferral of two dimensional information into the three dimensional reality of architectural expression. In order to convert the flat planes of the drawings created into space I first began to explore model making as a device, however, although these attempts created interesting results the models did not readily lend themselves for further transition. (refer to Appendix 2)

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104   Spuybroek, Lars, *The Architecture of Continuity*, Rotterdam: V2_Publishing, 2008, pg 57

The most successful results were achieved when the depth within the drawings were engaged. This time the modelling was done digitally, and the results were far easily applied. The spaces were born from the process of extruding the movement drawings. The constituents of each drawing were pulled from its setting; the distance pulled was calculated according to its depth of tone. This meant that the final extrusion truly mimicked the qualities of the drawing, including the intensity built up within moments of the image.

The extruded fragments were the framework over which structure and material properties were applied until these arbitrary pieces became an expression of built reality.

Fig. 31 (Opposite) *Space Making Exploration 1, Staircase,* Created by Author
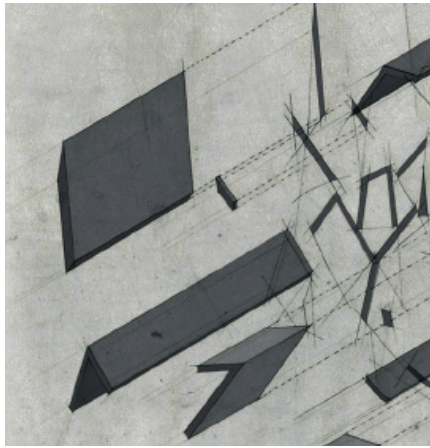
Fig. 32 (Top) Detail of *Space Making Exploration 2, Seat,* Created by Author

Fig. 33 (Bottom) Detail of *Space Making Exploration 3, Platform,* Created by Author

PLATFORM NINE AND THREE QUARTERS-AVA STATION

In order to engage with the architectural fragment and architecture stages, and then move towards an architectural application, a programme was needed to test the process which had developed. This test had to again start at the beginning of the process and move through each of the phases. As a test of the process a small programme was desired in order to be able to interact with it at a detailed stage.

The site needed to accommodate flux and flow of movement, it was crucial that many different people moved through the space, and it was of public use. Also interesting movement patterns were desired, particularly ones which displaced a user diagonally, as these would generate more interesting results. Ava train station, in Petone, fulfilled these criteria, as it is part of the public transport thoroughfare into the city of Wellington.

Pertinent motions of the site were chosen and recorded as the data to analyse for the test of the process. The three major gestures within the location were identified as a person moving through the staircase which formed the main access way to the platform, a person sitting on a seat to wait, and a person climbing on to a passing train. These motions were recorded as the most successful gymnast studies were, and then their depictions moved through the representational abstraction which had been set through the method.

Fig. 34 Ava Train Station, Photgraph by Author
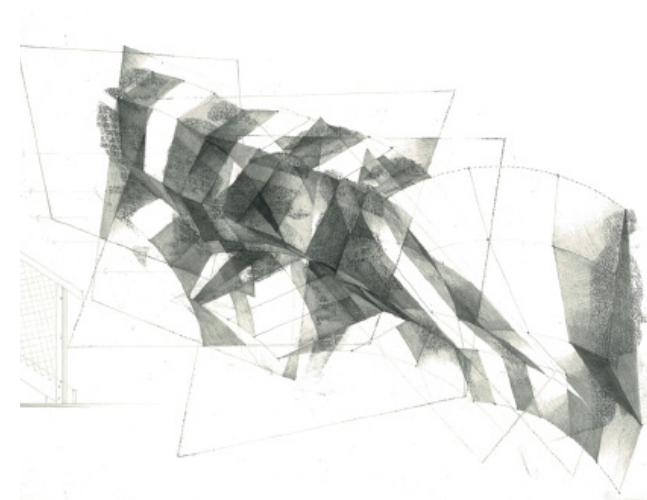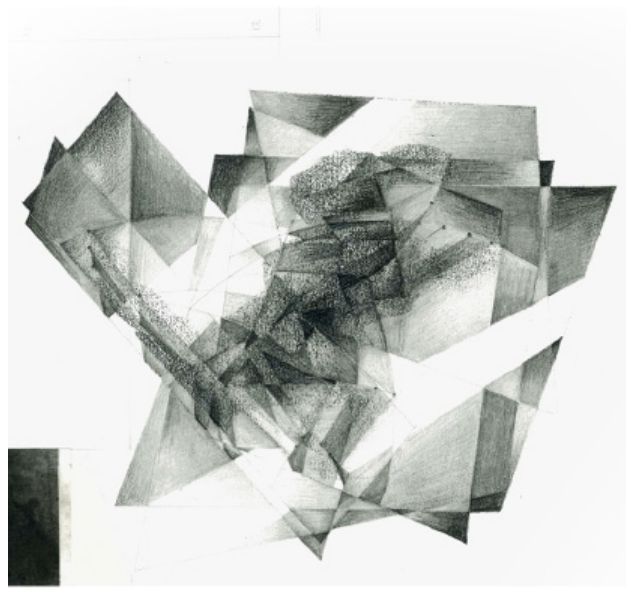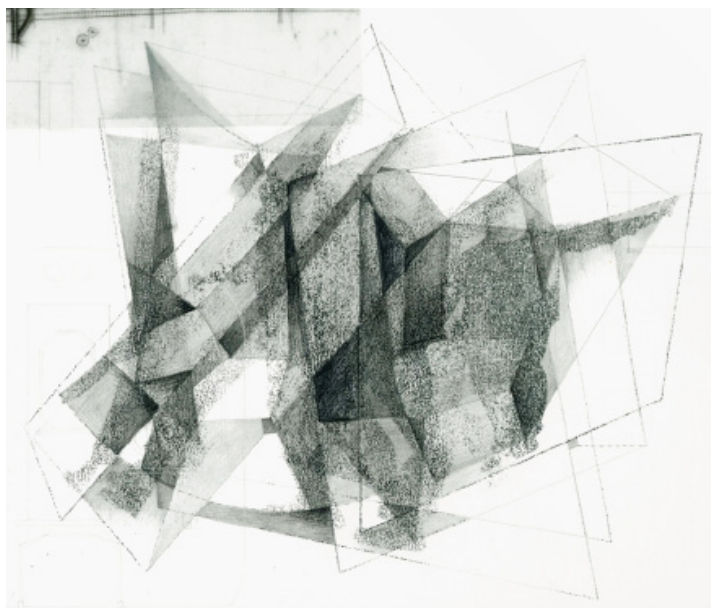
Fig. 35 *Final Motion Drawings, from left to right, Platform Study, Seat Study, Stair Study.* Drawn by Author

PLANARITY

TRANSPARENCY
(Phenomenal)

SIMULTANEITY
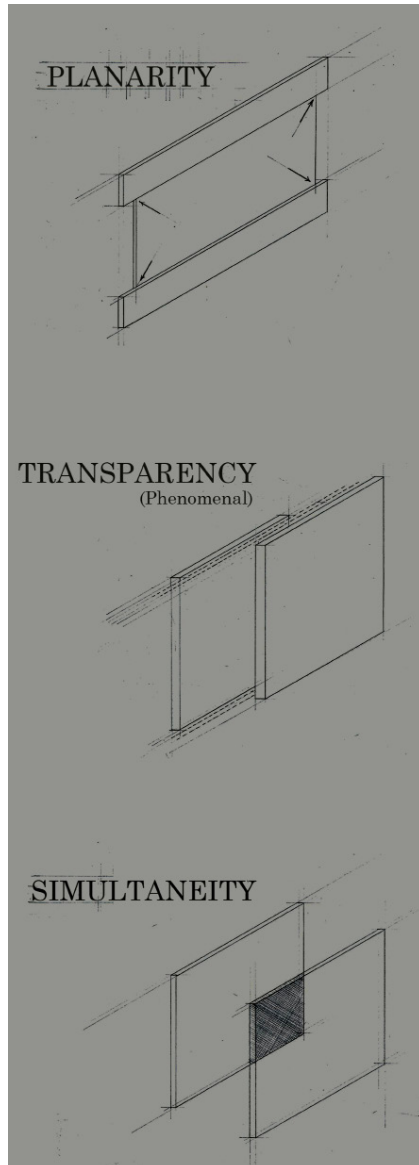
To further articulate the physical virtues this image was created describing each characteristic in physical terms.

ARCHITECTURAL FRAGMENTS

This stage was about mediation, mediation between theory and actuality, and mediation between part and whole. Characteristics were chosen to invigorate and channel the architecture, these qualities derived from the readings about the transition between Cubist art and architecture. Sigfried Giedion had identified the major similarities between the two modes in 1941 as planarity, simultaneity and transparency. Transparency became phenomenal transparency as this was determined by Rowe and Slutzky as a more appropriate definition. Rowe and Slutzky's text became exceedingly important as it described these characteristics in detail, and refined their meaning through the application of them in Corbusier's villa.

The material qualities of the conditions identified were very similar, with just subtle differences to differentiate them. It was decided that each of the attributes would be applied to just one of the three interventions at the train station. Although they would be divided they would exist in such close proximity that they would create a dialogue of totality.

The resulting architecture expression is a direct result of adding extrusion (from the spacemaking stage) and architectural fragment. The extrusion was scaled and extrapolated according to the function it had to accommodate and the qualities of the architectural fragment it was mimicking. Because of this, the movement essence manifested itself differently in every architectural portion. The movement drawings each correspond to an architectural intervention, which were established according to the location of each motion. The three interventions work on a variety of scales, the first being a seat, the second a staircase and the last the entire platform.

Fig. 36 (Opposite Page) *Architectural Fragments*, Drawn by Author, Pen on Paper

Fig. 37 (Above) *Architectural Fragment Model,* Detail of Planarity Model, Created and Photographed by Author, MDF and Acrylic

Fig. 38 (Right) *Architectural Fragment Model*, Simultaneity Model, Created and Photographed by Author. Acrylic and Plaster.
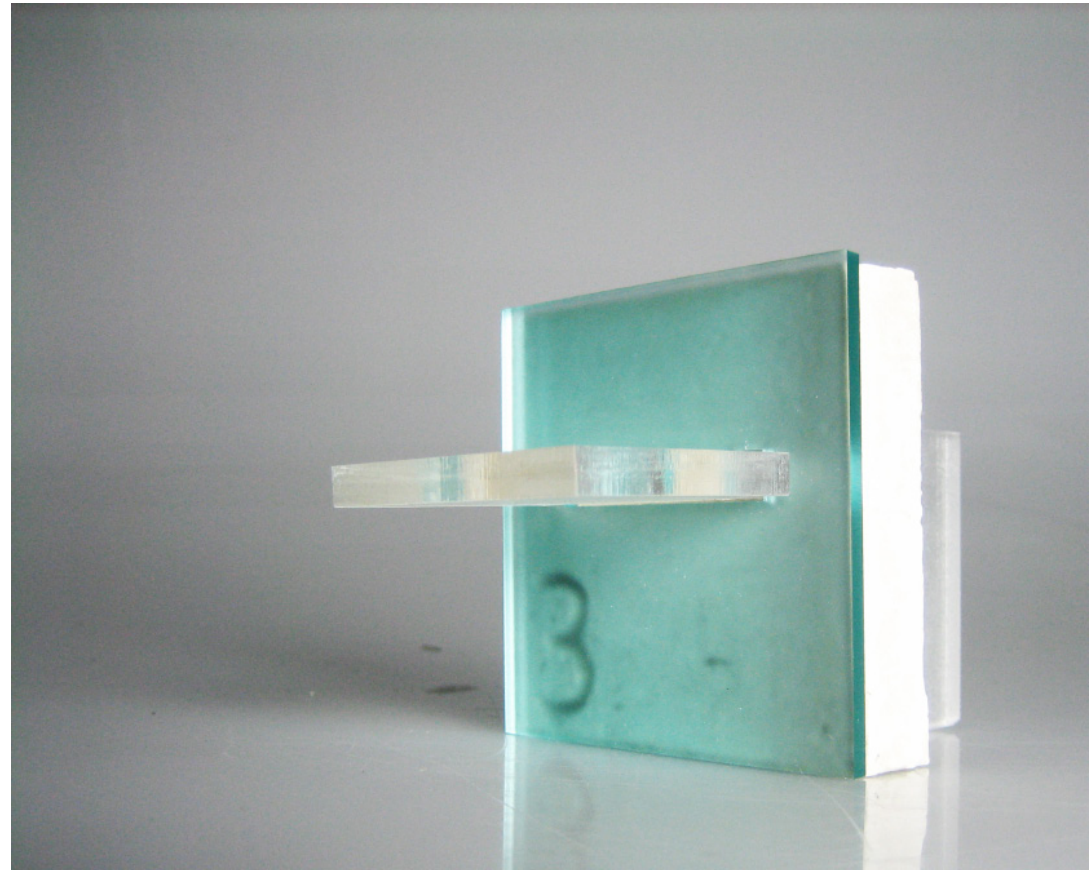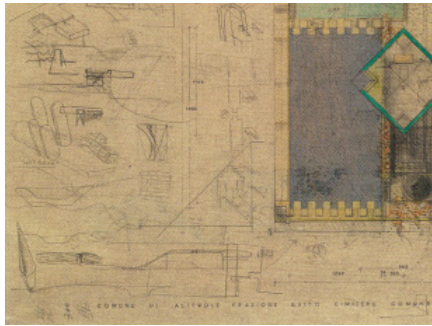
ARCHITECTURE

Fig. 39 Carlo Scarpa, *Detail of design for the Brion Family Tomb.* 1968.
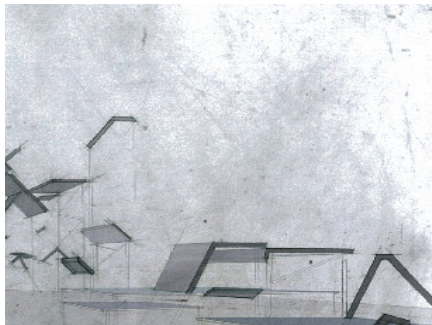

Fig. 40 Detail of *design for the platform intervention*, Created by Author

The process that I underwent to convert the extrusion to architecture distantly resembles Scarpa's, but the information was instead scattered between the drawing board and the computer screen. First a process of quick sketching was undertaken, working between a micro and macro scale for each intervention. Snippets of architecture were constantly produced and critiqued in correlation with the architectural fragment attribute, and the function of the intervention. The grainy quality within the multitude of drawings was built up from the techniques used to create them. The exchange between drawing board, scanner and computer left a hazy film of tiny marks which was, ironically, reminiscent of Marey's century-year-old photographic studies. The blue filter upon the images was also a consequence of their modes of creation. The cold ethereality of the images is amusingly disparate from the warm tones in Scarpa's process images, which were also a reflection of their mediums of creation.

The architecture created through the use of this process straddles the disciplines of art, sculpture and architecture. Perhaps this is unsurprising considering the heavy influence which modern art had on the method. Movement is distilled within the forms resulting in an emotive architecture, seemingly poised on the edge of motion.
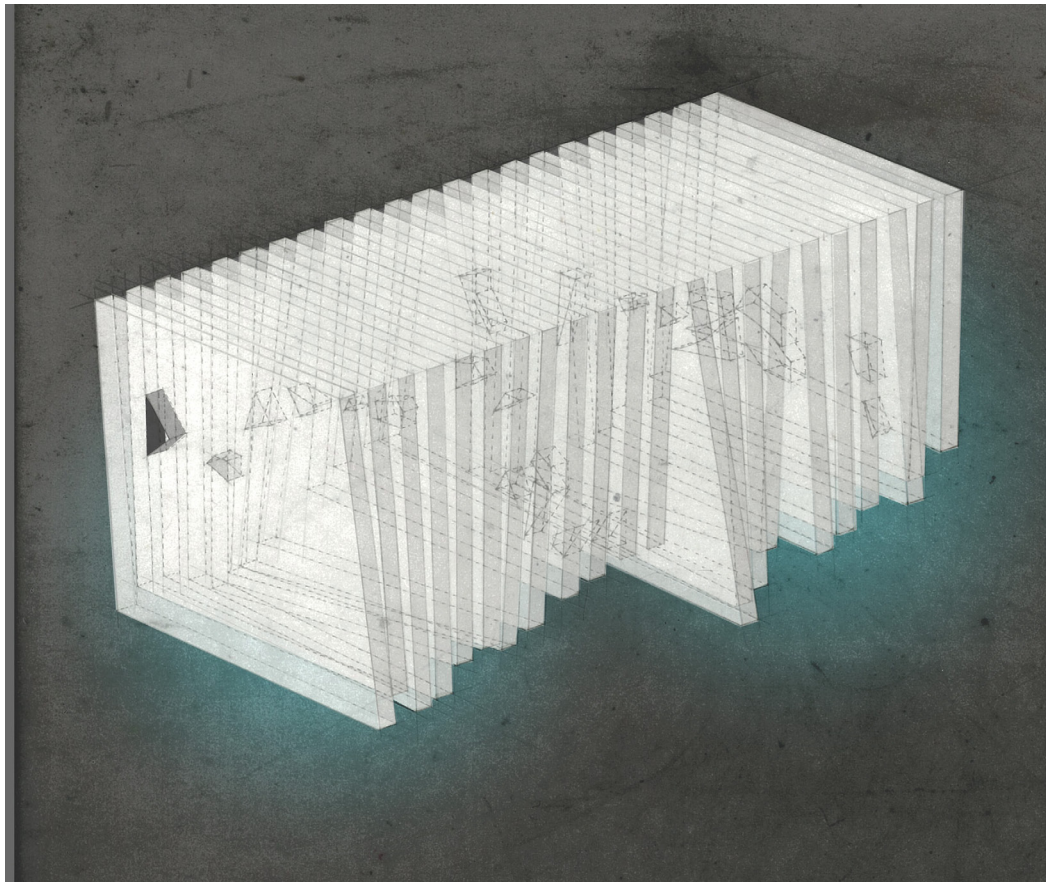
Fig. 41 Seat Design Intervention. Created by Author. Drawn and Digitally Enhanced.

The seat design is probably the most subtle of the three interventions. The fragment quality which this matches to is phenomenal transparency; this involves a shallow understanding of space which hints at a greater depth. To generate this experience an almost opaque plastic is used, with the movement extrusion embedded within the many planes that make up the seat. The placement of the extrusion fragments distort the planes which they inhabit, *implying* rather than revealing their existence. These plastic pieces have been placed upon a wire frame so they hang above the ground plane, emphasising the irregular patterning within the planes.

Fig. 42 *Staircase Intervention,* Created by Author. Drawn and Digitally Enhanced
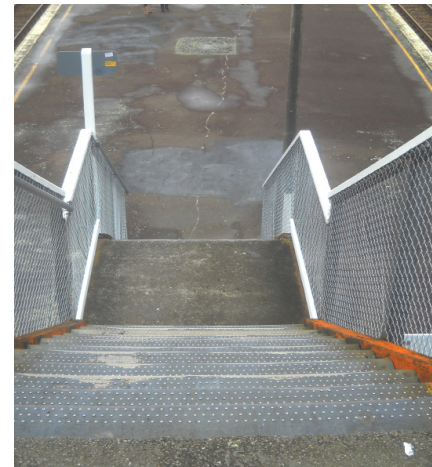
Fig. 43 *Existing Site Stairs*, Ava Train Station, Photograph by Author

Fig. 44 *Detail of Stairs*, Ava Train Station, Photograph by Author

The staircase is a crucial element within the existing site, and its form is already provocative although the quality of the built structure is low. The solution which was devised for this space encompasses the existing position of the stairs, and the pylons which hold up the existing staircase are reused in the architectural intervention. This layering of new and old recalls Scarpa's treatment of restoration in Castelvecchio.

Scale was a crucial element here. The initial attempts to redesign were centred around the extrusion being proportionate to the size of the body it was taken from. However the results from this trial were not lively enough, the extrapolation not surrounding the user. Therefore the user would not feel as though they were *inhabiting* the movement. Consequently the scheme was scaled up so the planes surround the thoroughfare within.
The extruded plastic fragments which make up this intervention were hung in planes, reflective of the planarity characteristic that inspired the form, and representative of the tension required of this characteristic.

Fig. 45 *Platform Intervention from West.* Created by Author. Drawn and Digitally Enhanced

Fig. 46 *Platform Intervention from East.* Created by Author. Drawn and Digitally Enhanced

The most obscure architectural translation is the largest of the three interventions; the platform. The movement pieces which play across the platform space are seemingly without function, although they could provide shelter to its inhabitants. This time the pieces were extruded from the drawing perpendicular to the direction that the other fragments occur. This way the fragments hover above the existing platform, creating a dialogue between the old and the new. The concurrent existence of both makes the user aware of their simultaneity, which was, of course, the desired quality.
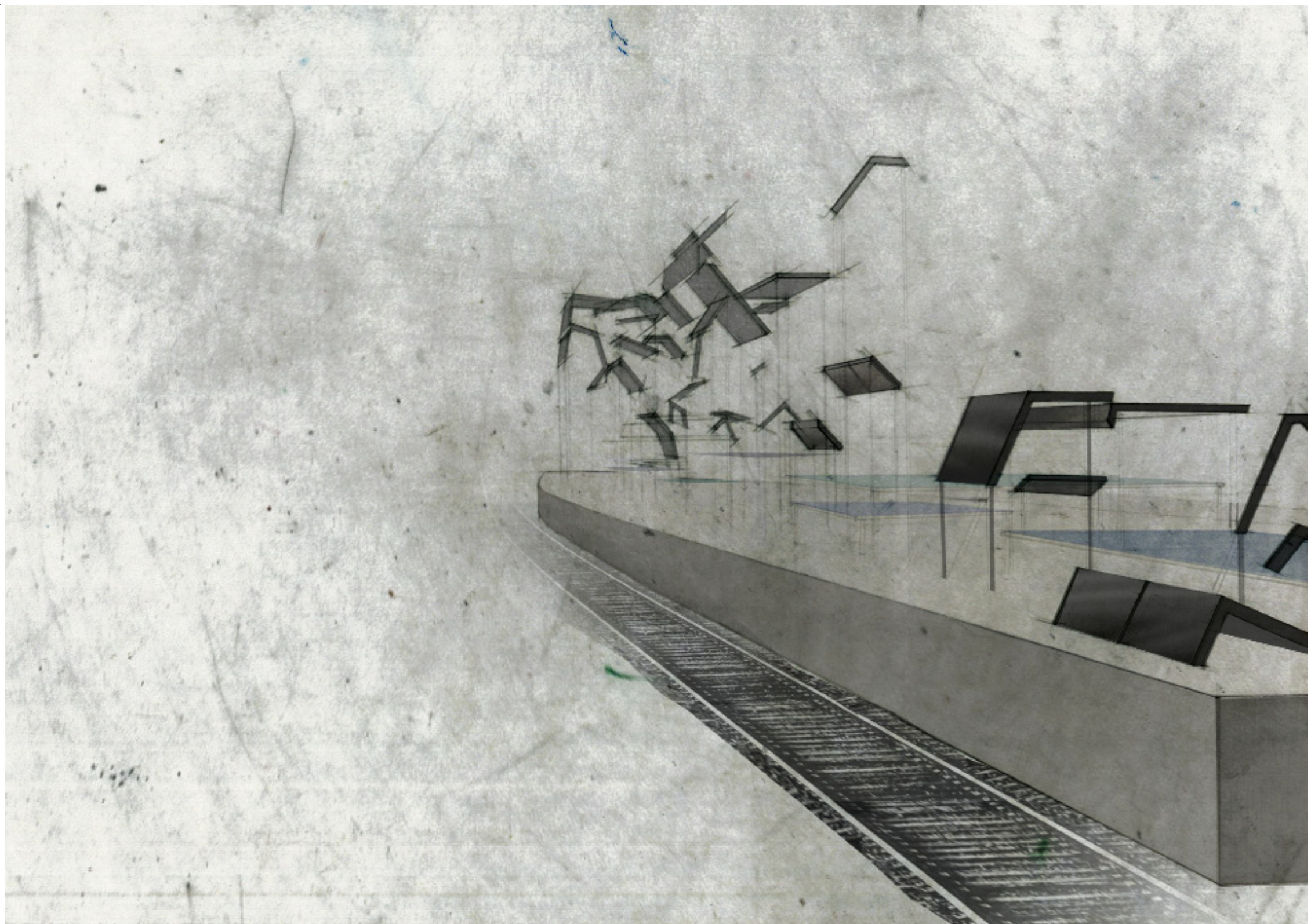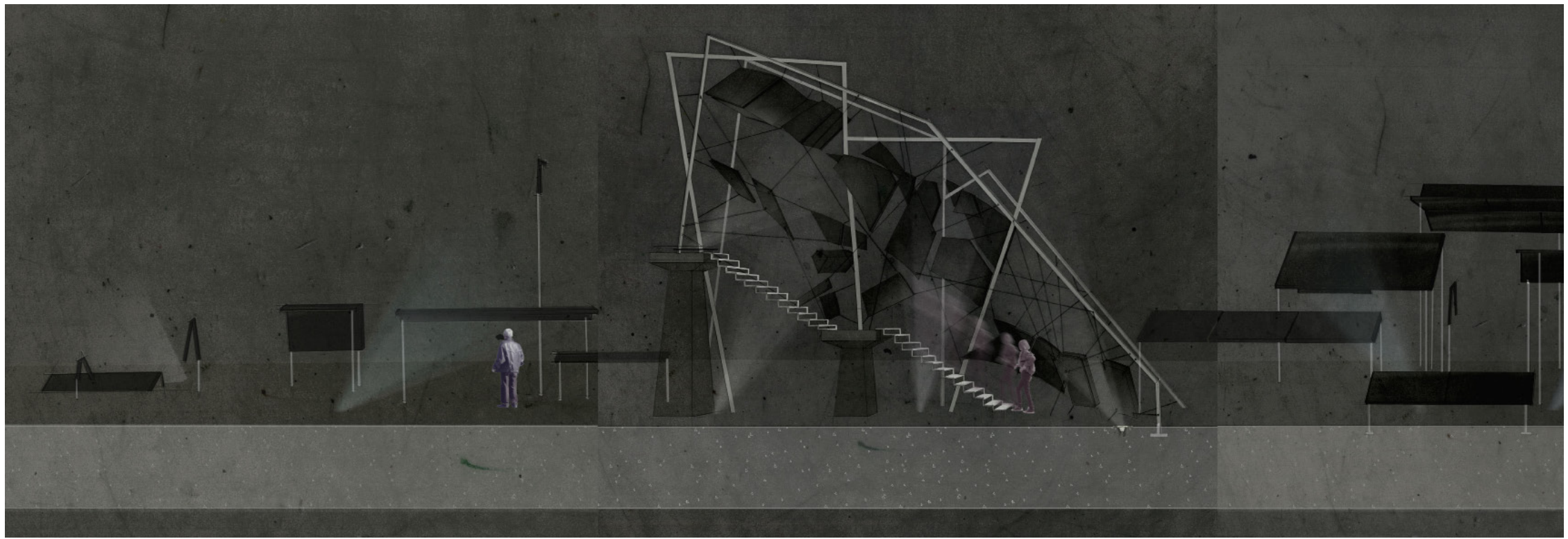
Fig. 47 *Perspective Section of Interventions Combined.* Created by Author. Drawn and Digitally Enhanced

The architectural interventions are very successful individually, if a little overwhelming together. The architecture engages the user so anyone experiencing the space will be able to project the movement back onto their bodies. The architecture does not deny its fragmentation, and yet the configuration of the fragments is constantly referring to its context and totality, if viewed from certain vantages glimpses of the original composition will be revealed.

The final architectural expression is a test or a possibility for the application of this process. In the larger scale example of the platform the result can be overwhelming in its presence. The busy expression which was the outcome of the method sits comfortably in its setting but does not lend itself to easily interact with other objects of intensity, such as the stairs. A truly successful,

but comprehensive application of this method may have to treat this intervention in a more subtle way. Another solution could be to apply the method to the entire train line, creating architectural interventions along it that's totality can only be conceived by experiencing the journey past them.

Although multiple applications of this scheme could be explored this solution is successful in its simplicity. The interventions are statements which call attention to themselves, and lead the viewer to question their genesis. The material palette confines itself to metals and plastics, further establishing these architectural entities as a contemporary continuation of historical trends and enquiries. This application of bodily imagery creates a lively scheme to be enjoyed by its occupants.
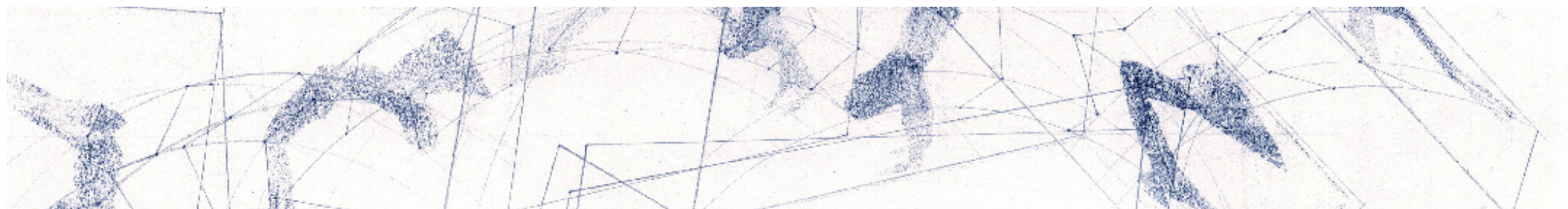
Conclusion

This thesis revitalises the use of body imagery in architecture through a positive application of bodily perception. The aim of this was to better the well-being of the occupants within spaces designed. Current architectural entities created often deny humanistic qualities, and are left devoid of feeling, like lifeless corpses. The process within this thesis undertaken awakens architecture, breathing new life through the use of relevant bodily imagery.

The design stages which were used in this architectural process act as filters, sifting information into a form which was carried through to the architecture. The series of phases created were broken down into clearly delineated portions, enabling a smooth transition from part to part. This method of abstraction allowed a hierarchy to be established, where only the most pertinent information from the initial data was passed through.
The design benefited from the exchange between theory and practice. Exploration of written text and historic imagery was carried out as experimentation began, these studies were used to define the method for the early processes. Important supporting characteristics, such as iridescence and the fourth dimension, were able to be explored through the investigation of both written text and physical construction of images. Ideas were clarified by the consideration of both these mediums.

When embarking on a contemporary evaluation of the use of the body, fragmentation cannot be ignored. Hence this study utilized a new use of fragmentation; positive fragmentation. This was an interesting re-invigoration of the time-tested theme. Once the spatial oddities of Analytical Cubism were employed, the reinterpretation of this artistic endeavour proved successful in drawing out the qualities of the positive fragment, and applying them to bodily depictions.

The second line of enquiry central to this thesis, the representation of the dynamic body, was next explored. Traditionally Cubist artists did not depict many scenes of motion, so the techniques of the movement were developed for tangential purposes. However, by re-examining and applying the processes of these artists in a new way it was shown that the Cubist art could be used for this purpose. The understanding of representation as an experimental process, and the rigorous application of this concept was imperative to the success of the project.

The resulting analysis of these two factors was a continuation of the explorations commenced by early 20th century artists and photographers. The fragmentation and temporisation of space which was engaged by artists and filmmakers of that time had not been considered by architects. This thesis responded as it was established that contemporary applications of the body were lacking, therefore it was a case of looking back to go forward, and their techniques were harnessed by accepting the part but also re-embracing the whole.

Looking at historical interpretations of body images led the thesis to explore imagery through manual techniques. The use of a manual form of experimentation is a deliberate choice, the computer is not, however, viewed as redundant in this thesis. The move from hand drawn architectural practices to computer aided creations is inevitable. In fact the later stages of the design method utilised digital means as a part of the architectural design process.

The mode of enquiry used was similar to Carlo Scarpa's process but moved on from his methods. The combination of techniques offered a fresh exploration of the topic and grounded the architectural response as a contemporary interpretation.

The drawings created through the analysis of the positive fragment and body in motion were found to be successful. However, the transition to architecture from here was experienced as more strenuous. It was important that the configuration of the parts within the architecture revealed their context, and from there entered into a dialogue with the whole. All three architectural interventions all do this, some more explicitly than others. The resulting architecture is unashamedly fragmented but also 'confident about the whole' and successful in its effortlessness.

Most importantly the architecture forces its users to consider the genesis of its form. Once the user inhabits the space they will project their own physicality and locomotion onto the architecture and, through these reflected qualities, bring it alive.

The aim of this thesis was to explore the position of the human body in motion, and investigate its use as a driving force behind the design process. The process designed has provided a tool to 'pass on' the movement of today's fragmented body. The stages described allow the negotiation to a final product which embodies the desired immaterial attributes. The design solution depicted has an unfinished atmosphere which was deliberately embedded within the representations. This illustrates the sense of the further application and possibilities for this design process.

Similar to a figure poised at the top of a staircase, the architectural expressions hold kinetic potential. There is a holistic persona carried within the collections of fragments which feel as though they may at any moment burst into motion. The success of the project remains in the fact that we can be assured that in this instance the fragments would not move independently, but together as one architectural body.
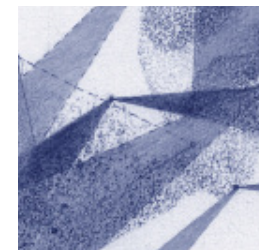
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Appendix One

This appendix documents the second stage of the design process; drawing.

Throughout this exploration the depictions created were assessed against criteria set from the desired characteristics, positive fragmentation, spirit of motion and Cubist techniques. The resulting images are a reconfigured version of the Cubist language.

These experiments determined the manner in which the movements within the site would be recorded, this meant that this stage was crucial in determining the success of the project. The most successful drawing techniques, as discovered through this process, were applied to the selected movements within the site. These drawings were then passed through to the Architecture stage.
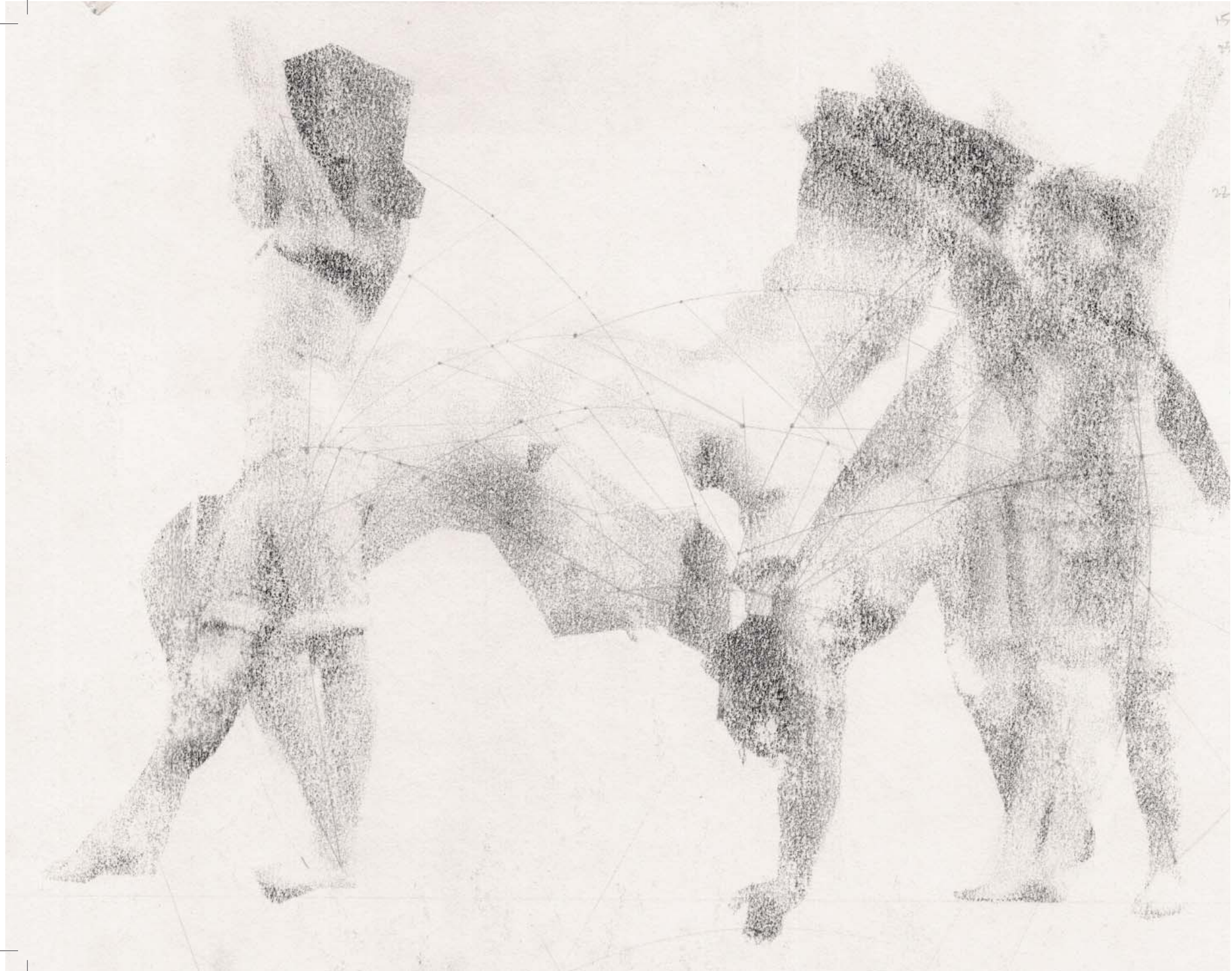
Experiment One
BOARD # ONE

Description:

The image created was an acetoned depiction of a gymnast executing a backwards walkover on a beam. The two dimensional movement which is shown occurs virtually all on one plane.

Movement lines have been traced in pencil over the image following the movements of the body.

Techniques/Influences:

A technique which has been developed from the influence of Etienne Jules Marey, the nineteenth century photographer is used here. The procedure is to map the positions of points upon the body and then draw lines joining each of these points. Marey's goal was to observe the human body as an 'animate machine', and therefore he had to remove the presence of flesh, leaving behind the impression of a moving skeleton. To achieve this he 'clothed his subjects in black, marked their joints with shiny buttons, and connected the buttons with metal bands'.[1]

The drawing exhibits an appropriation of Marey's technique, the points mapped start with the head and then move down to the shoulder, hip, knee followed by the ankle. This technique helps to show clearly the direction of motion and also the space which is occupied while the movement occurs.

Relative Success:

This image was an interesting starting point as the acetoned figure has a certain amount of transparency and ambiguity while retaining its general form. Also the technique shows density where a flurry of movement occurs, but remains light enough to draw over.

The experiment however does not really interact with the space around the figure and therefore the intention of referencing the context of the figure has not really been reached. This aspect has still got to be further explored.

The test also begins to recall the theme of fragmentation. The body's movement has been sliced into moments but presented simultaneously, creating the possibility that the viewers gaze will start to focus in and out, between the parts and the whole. However this image is reading at a very holistic level at the moment which suggests further emphasis on the fragmentation of the form is needed.

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1   Braun, Marta, *Picturing Time: the work of Etienne-Jules Marey (1840-1904)*, Chicago: The University of Chicago Press, 1992, pg 81
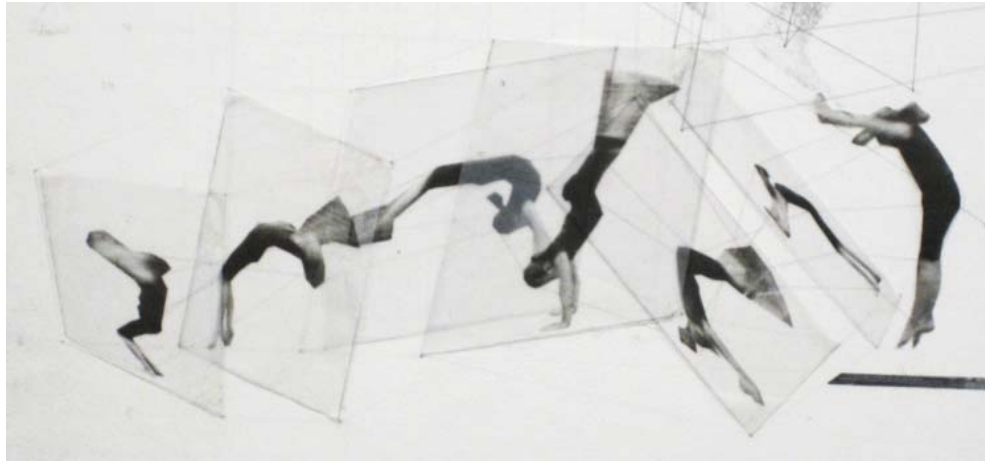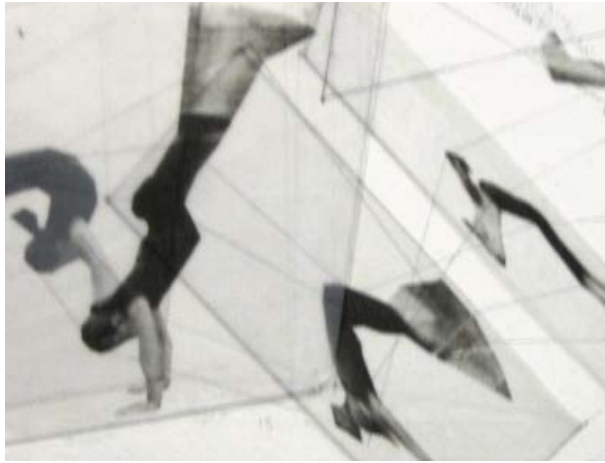
Experiment Two
BOARD # ONE

Description:

This experiment shows a black and white image of a gymnast performing a flic-flac, printed onto translucent detail paper.

Techniques/Influences:

Duchamp's *Nude Descending a Staircase* was heavily criticised when it was first shown because it did not exhibit many qualities which artists considered quintessential to the Cubism Style. One of the aspects of Cubism was the implication of the creator's movement in space. The single plane that Duchamp's *Nude* worked upon and the simplicity of the reading denied the viewer the challenge to decipher and, therefore, engage with the motion.

This experiment was therefore created as a reaction to this criticism, in order to address some of the aspects which were identified as missing in Duchamp's painting. The first step was to provide multiple planes on which the frames of the movement would sit. To supply these planes Esprit Jouffret's Four Dimensional model (the perspective *cavalière)* was used. This was deemed appropriate as this model was used as a source of inspiration to the Cubists as they developed their faceted forms.[1]

Jouffrets model has been distorted in this experiment as the fluidity of the movement is maintained. The points of Jouffretts model have been extruded across the page so they now represent a reference plane upon which many points may sit. These reference planes support the corners of each of the distorted rectangles which have been pulled from Jouffret's diagram. The points were extruded 30mm across so the planes occur regularly.

Relative Success:

In 1941 Sigfried Giedion articulated what he believed to be the three key components of Cubist art. He stated that these characteristics were 'planarity, transparency and simultaneity.'[2] The planarity is clear in the image as the milky quality of the paper expresses the surface and allows them to be built up and overlaid. However the medium used, the printing, lacks some of the subtlety of the earlier attempt. This experiment has an opaque quality to the human forms, which denies the characteristic of transparency, therefore the next experiment will not be created in using this mode.

1   Henderson, Linda, *The Fourth Dimension and Non-Euclidean Geometry in Modern Art,* Princeton, N.J: Princeton University Press, 1983 pg 58 It is believed that Maurice Princet introduced Picasso to Jouffret's *Perspective Cavalière* and the shapes within this image Picasso directly appropriated into his *Portrait of Ambroise Vollard.*

2   Evans, Robin, *The Projective Cast*: *architecture and its three geometries*, Cambridge, Mass.: MIT Press, 1995 pg 57
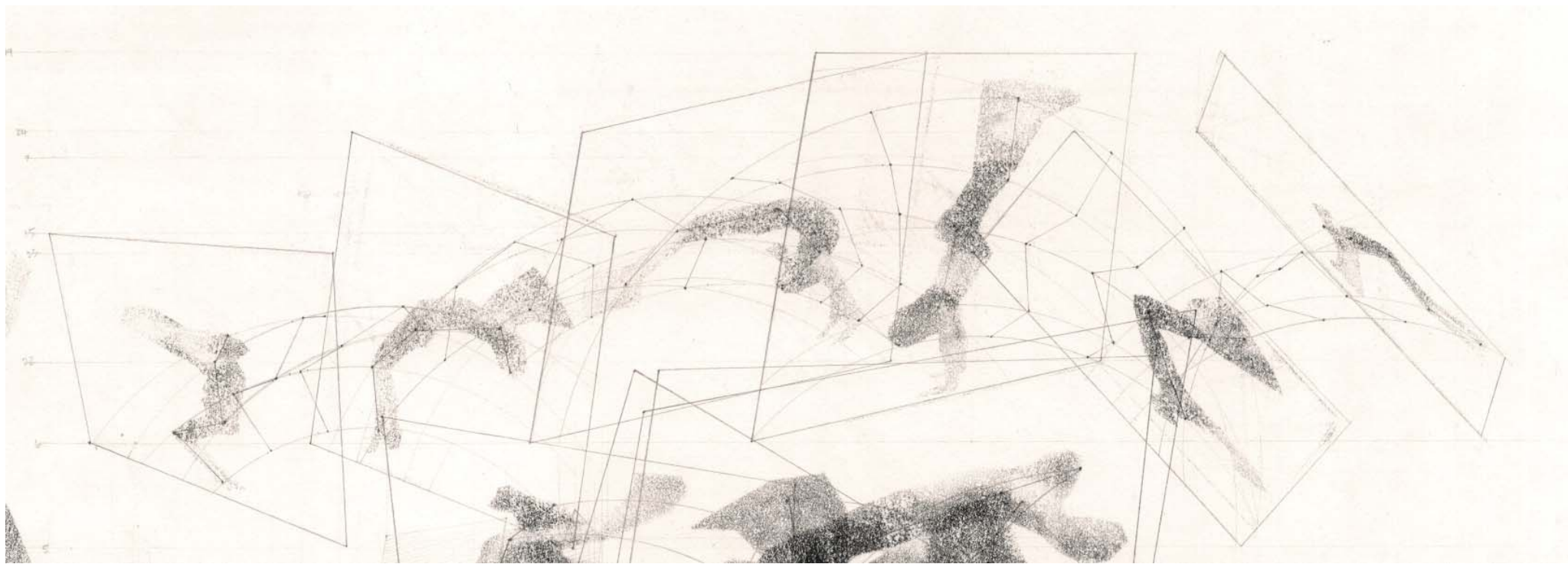
Experiment Three
BOARD # ONE
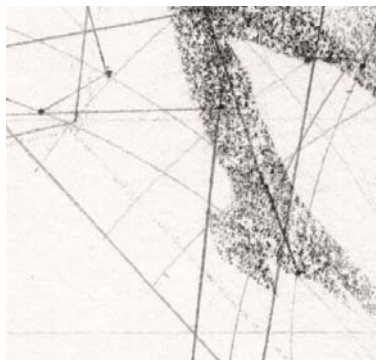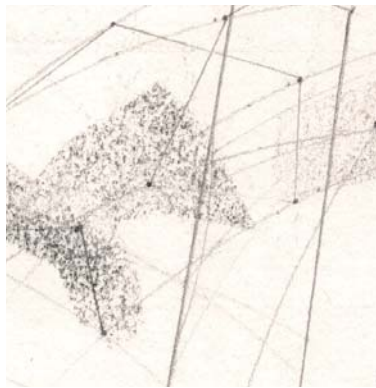
Description:

The image created here is a slightly larger version of the previous experiment. The depiction was enlarged in order to more accurately experiment on, and the figures within the image were acetoned onto the board. The acetoned bodies have once again been drawn over, so the thin tracking lines form a fine web which is draped upon the figure's motion.

Techniques/Influences:

Jouffret's model was again used to establish the planes on which the frames of motion would occur. This time -because the planes have been scaled up- the points from which the plane's position are derived are pushed twice as far (60mm) from one another.

Now that the figure has been acetoned, and a certain amount of transparency is still evident, the bodies can be drawn upon. Etienne's technique of mapping joints is also employed, but instead of simply linking from joint to joint across planes, these lines are extended until they hit the edge of each plane that the figure occupies. This means that the direction of motion has been emphasised and prioritised and they starts to interact with, and include, the space around the figure.

Relative Success:

The technique of placing the movement on different planes is pushing the notion of traditional two dimensional representation of motion, and testing forms in a similar way to Cubism's explorations. However the procedure of extruding the points 60mm from one another has accentuated the inaccuracies in this technique, as the movement has been stretched, and is now no longer precise. To counter this the next exploration will reassess the distribution of the planes.

The technique of extending the movement lines to the edge of the planes has yielded interesting results. The direction of movement is much clearer, and the space around the figure is now also becoming fragmented so the boundaries between object and ground are more blurred.

Experiment Four
BOARD # ONE

Description:

This image was generated from the depiction of a gymnast performing a front somersault off a beam. This picture was chosen to retest the techniques as it involves the displacement of the figure from a high plane to a low plane.

Techniques/Influences:

The same drivers created this image, Jouffret's four dimensional image and Cubist principals. However to counter some of the problems from the previous experiment the arbitrary distance that the planes were extruded on has been removed, and instead the planes are placed according to the subjects centre of masses. The positions of their centre of masses are earlier mapped from the original image of the movement and then the planes are overlaid to intersect these positions.

Relative Success:

This experiment has significant depth within it which has been created through the overlapping of the motion. Unfortunately the deep colouring of the overlaid images meant the movement lines overtop were not as evident. This loss of movement lines has taken some of the complexity and fragmentation in the previous images and renders this expression as too simplistic.

The new technique of mapping the planes according to the original centre of mass is successful. It retains the idea of simultaneity while presenting the true movement. The further overlapping of the body conjures the sense of flux between the frames of motion and the whole, therefore this technique will be used again.
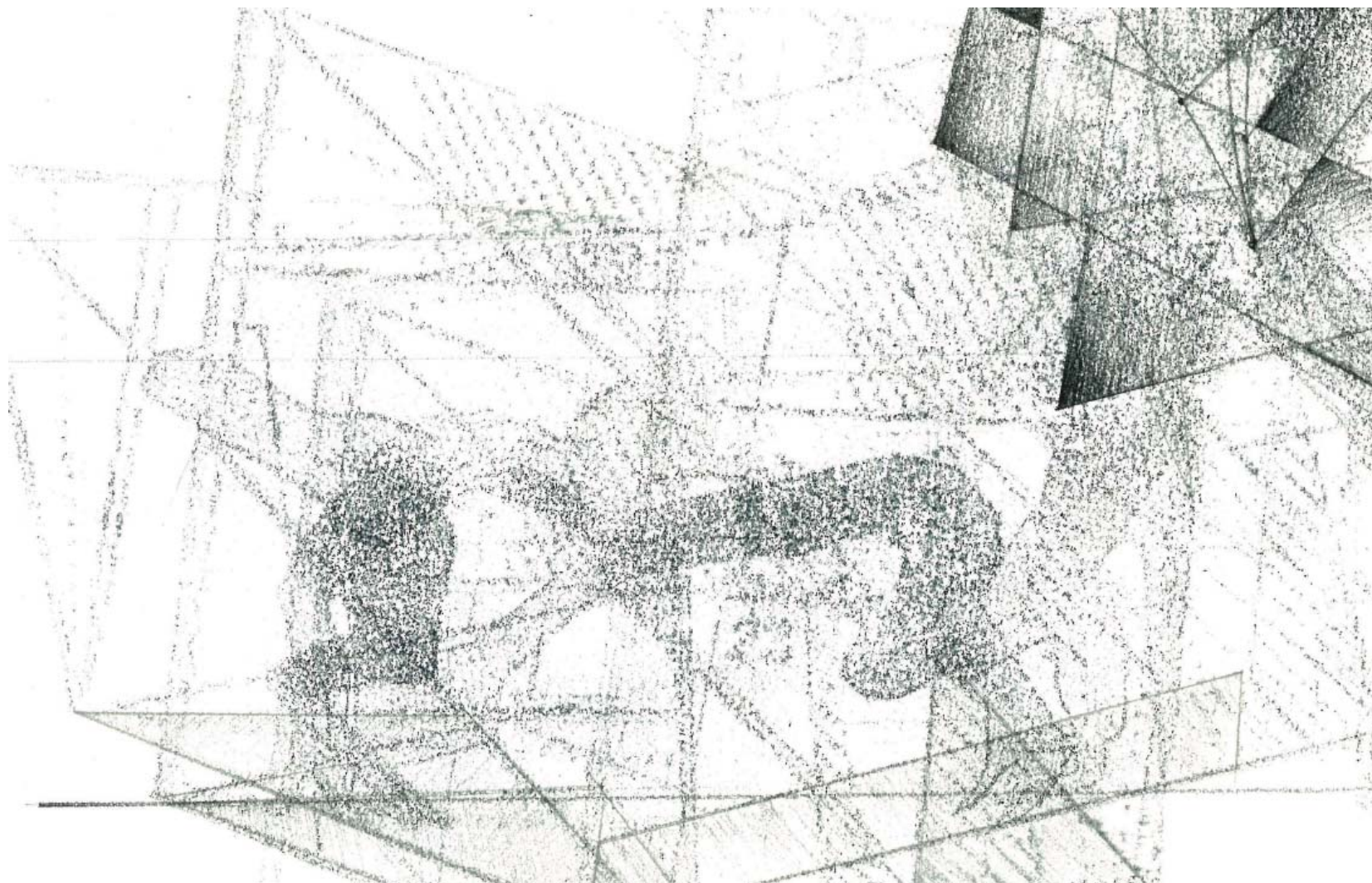
Experiment Five
BOARD # ONE

Description:

The image depicted is of a gymnast performing a flic flac. It has been acetone transferred onto the board, and has a slight blue tinge to the ink.

Techniques/Influences:

The gymnast has again been placed upon planes derived from Jouffret's four dimensional model. This time the planes have remnants of the Jouffret *perspective cavaliere* image upon them, therefore referring to the context which they have been taken from. The ability to refer to the individual part, but also the whole form which it is derived,is a primary characteristic of the positive fragment.[1]

The figure is enveloped within hatching and lines from this image, and the focus of the experiment has become blurred as the outline of the person is no longer so distinct.

Relative Success:

This image was created to explore ways which the figure and the space around it could be blurred in a manner which recalled the Cubists and the context of the image. However the context which has been taken, the hatching from the Jouffret image is arbitrary to the figure and therefore the result is incoherent. Although the end result is more faceted then previous attempts and therefore more closely resembles the visual language of the cubists the image does not exhibit positive fragmentation as was hoped.

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1   Veseley, Daibor, Architecture in the Age of Divided Representation, : the question of creativity in the shadow of production, Cambridge, Mass.:MIT Press, 2004 pg 335
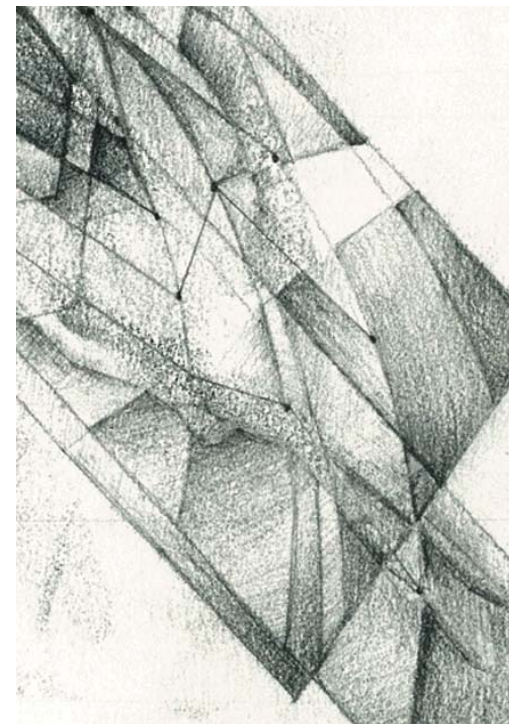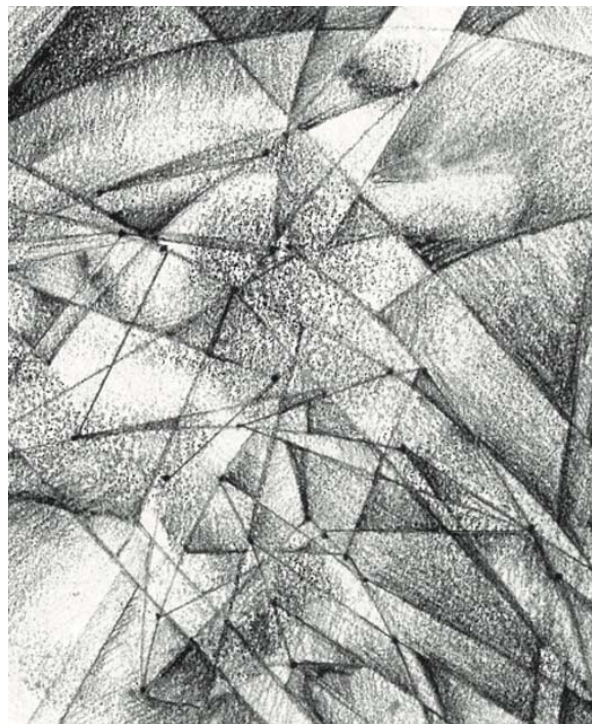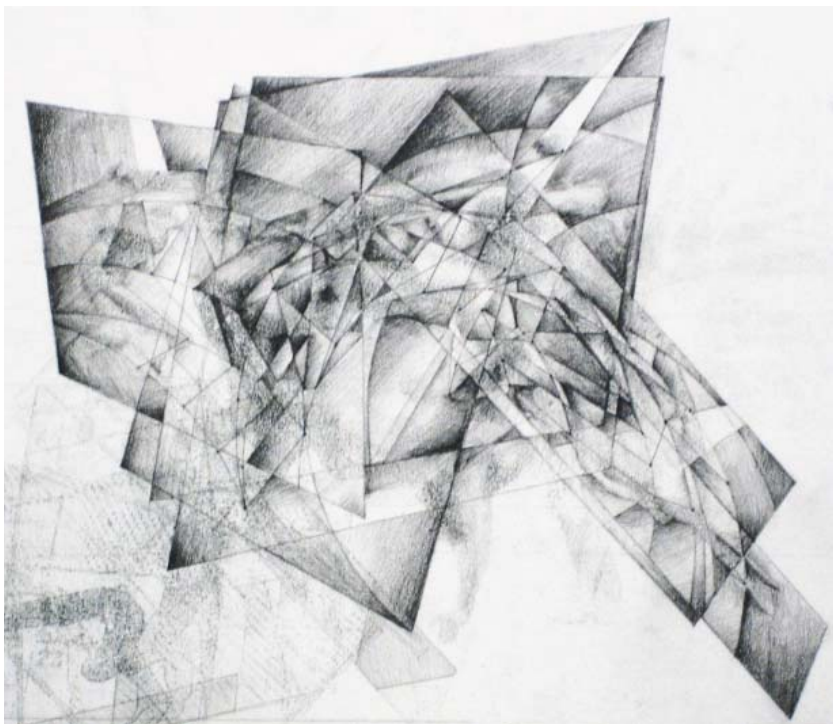
Experiment Six
BOARD # ONE

Description:

The image was again generated from the image of a gymnast somersaulting off a high plane to a lower plane.

Movement lines were mapped across the depiction and then it was rendered according to the position of two shafts of light which cut through the image.

Techniques/Influences:

This image has been created using the same method as the previous experiment; however the lines which have been projected between points have again been extended (as in experiment three) to meet the edges of the planes.

To start creating spaces with depth and weight from the wire form outlines the Cubist ideal of adding multiple light focus points was used.[1] Shafts of light were driven through the images, and the sketches were rendered accordingly. The manner in which the light hits the bodies was of particular interest, and where many sections of the bodily movement overlapped the light was treated as obstructed.

Relative Success:

This interplay of light and dark shading compounded into an image which has thoroughly taken on the language of the Cubists. The image is reminiscent of many of Braque and Picasso's still life's and holds similar traits. One of the characteristics of Analytical Cubism- the style that this image so closely resembles- is the suppression of depth,[2] therefore the idea of creating space was limited by the shallow distance that seems to be portrayed. This limitation could be overcome in the next stage of the process.

The other attributes that characterise cubist and four dimensional, portrayals as listed before are simultaneity, transparency and planarity. Each of these qualities can be detected within this image and therefore it is carrying through the qualities of Cubism, and with it positive fragmentation.

The major achivement of this image is that it is still showing the essence of the movement which was first recorded. The spidery lines which track the bodies movement are still apparent and the semi circular tracks which they cut through the space helps our eye move through the image.

1   Rowe, Colin, The Mathematics of the Ideal Villa and other essays, Cambridge, Mass.: MIT Press, 1976, pg 172

2   Rowe, Colin, The Mathematics of the Ideal Villa and other essays, Cambridge, Mass.: MIT Press, 1976, pg 172
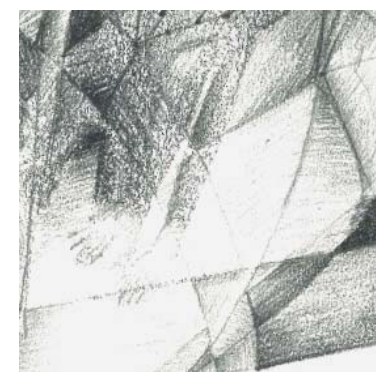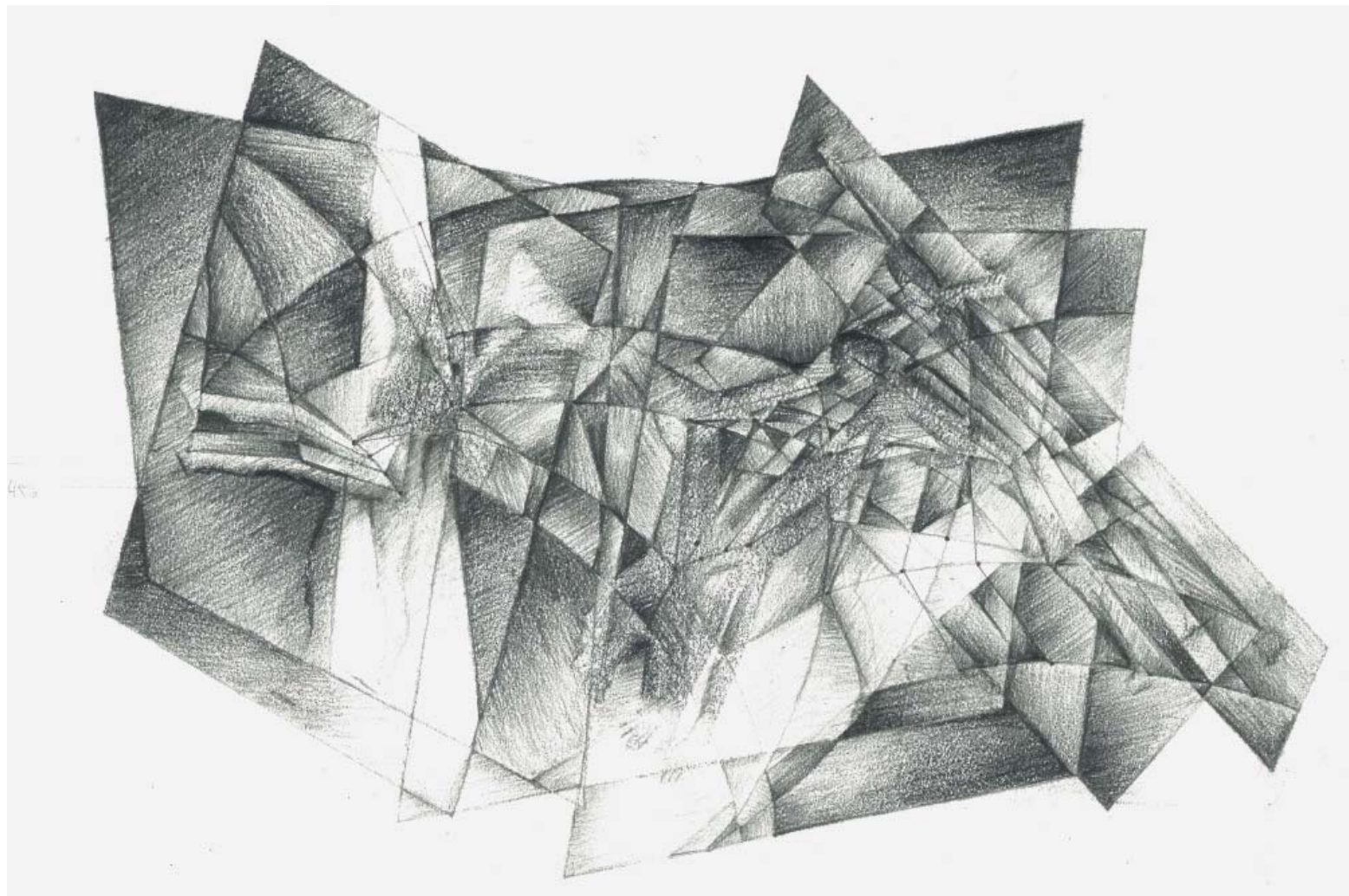
Experiment Seven
BOARD # ONE

Description:

This experiment has gone back to using the gymnast moving across one plane, where she is performing a flic flac.

As in the last experiment movement lines were mapped across the depiction, then it was rendered according to light shafts piercing the space. This time three light shafts are driven through the image.

Techniques/Influences:

The same technique was used as the last experiment in order to render the image. However, this time more emphasis was given to the body of the figure in movement. Depth was built up over top of the bodies using a soft pencil before shading with the harder leads. The tonal differences were also emphasised further so there was more contrast within the artwork, and the light shafts can be more easily differentiated from the rest of the space around the viewer. The overall effect is a more coherent image but one that has lost some of the allure of the previous experiment.

Relative Success:

This image is a culmination point for board one as it- and the last experiment- have successfully captured the essence of the movement while exploring Cubist techniques. The method employed has created an experiment which is representative of the movement it depicts, but also carries its own tension which engages the viewer.

IREDE
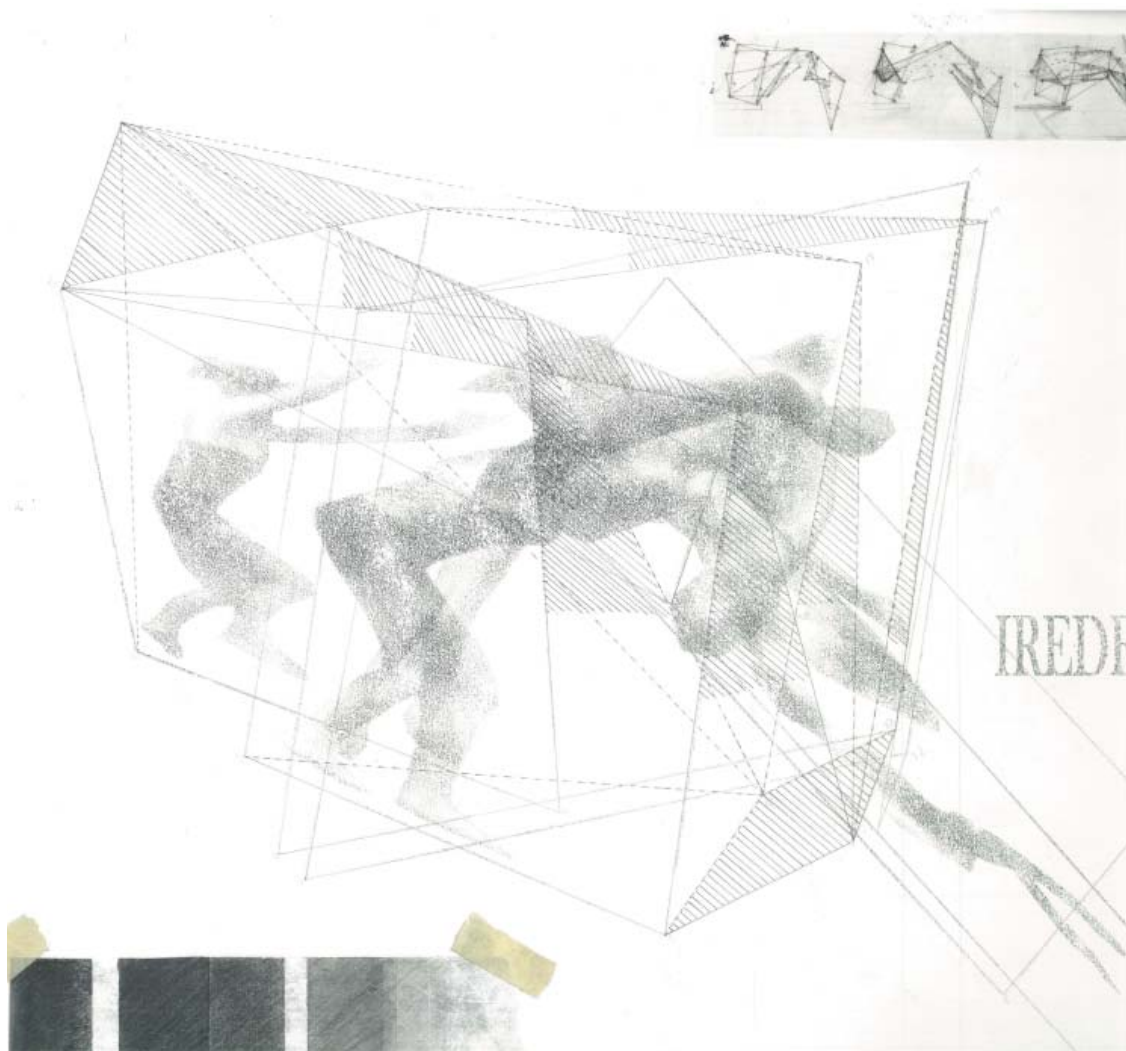
Experiment Eight
BOARD # TWO

Description:

This experiment depicts a gymnast jumping from a beam to the ground while performing a front somersault. A distortion of Jouffret's fourth dimension diagram has been patch-worked over top of the image.

Techniques/Influences:

This image was created as a further exploration of Jouffret's *perspective cavaliere* diagram and its influence over the Cubist style.

Within art historian Linda Henderson's text *The Fourth Dimension and Non-Euclidean Geometry in Modern Art* she writes about the similarities between Jouffret's diagram and Picasso's *Portrait of Ambroise Vollard.* She culminates the comparison by commenting on 'the shading of certain of these facets [which] creates shifting relationships that contribute to a general shimmering quality of "iridescence" in the diagram as well as in the Picasso painting.'[1] This statement was immediately of interest as it seems to reference the tension which can be found in a successful Cubist image. The experiments on this board will seek to capture this tension, as it will therefore give substance to the movement which is being depicted.
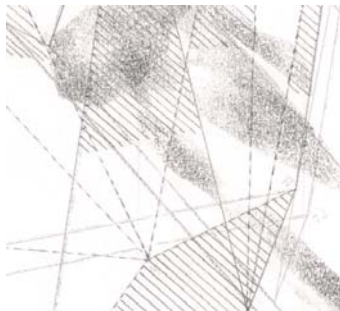
The forms which track overtop of the figures have been appropriated directly from the Jouffret's diagram, but are pushed and pulled according to the movements of the figure. In this way a sense of proprioception is achieved, the shards of the diagram have become external limbs moving and responding to the centring of the figures fragmented movement.

Relative Success:

This image is a departure from the explorations on the previous board. These experiments upon Board 2 will be focused upon representing the invisible qualities which the early Cubist images evoke, but not so much using the language of their images. More emphasis is also to be placed on the movement captured within the representation, not just the figures movement, but the implied movement that results from the 'shifting relationships' between planes.

The image depicted has some success in achieving these aims but is relying too heavily on the forms within Jouffrets diagram. The next image will attempt to develop this and give more emphasis to the bodily movement within the work.

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1   Henderson, Linda, The Fourth Dimension and non-Euclidean Geometry in Modern Art, Princeton, N.J: Princeton University Press, 1983 pg 58. Many other art historians, such as Christopher Gray and Winthrop O. Judkins have used the term 'iridescence' to describe the 'ambiguity of form both two-dimensional and spatial.'

124
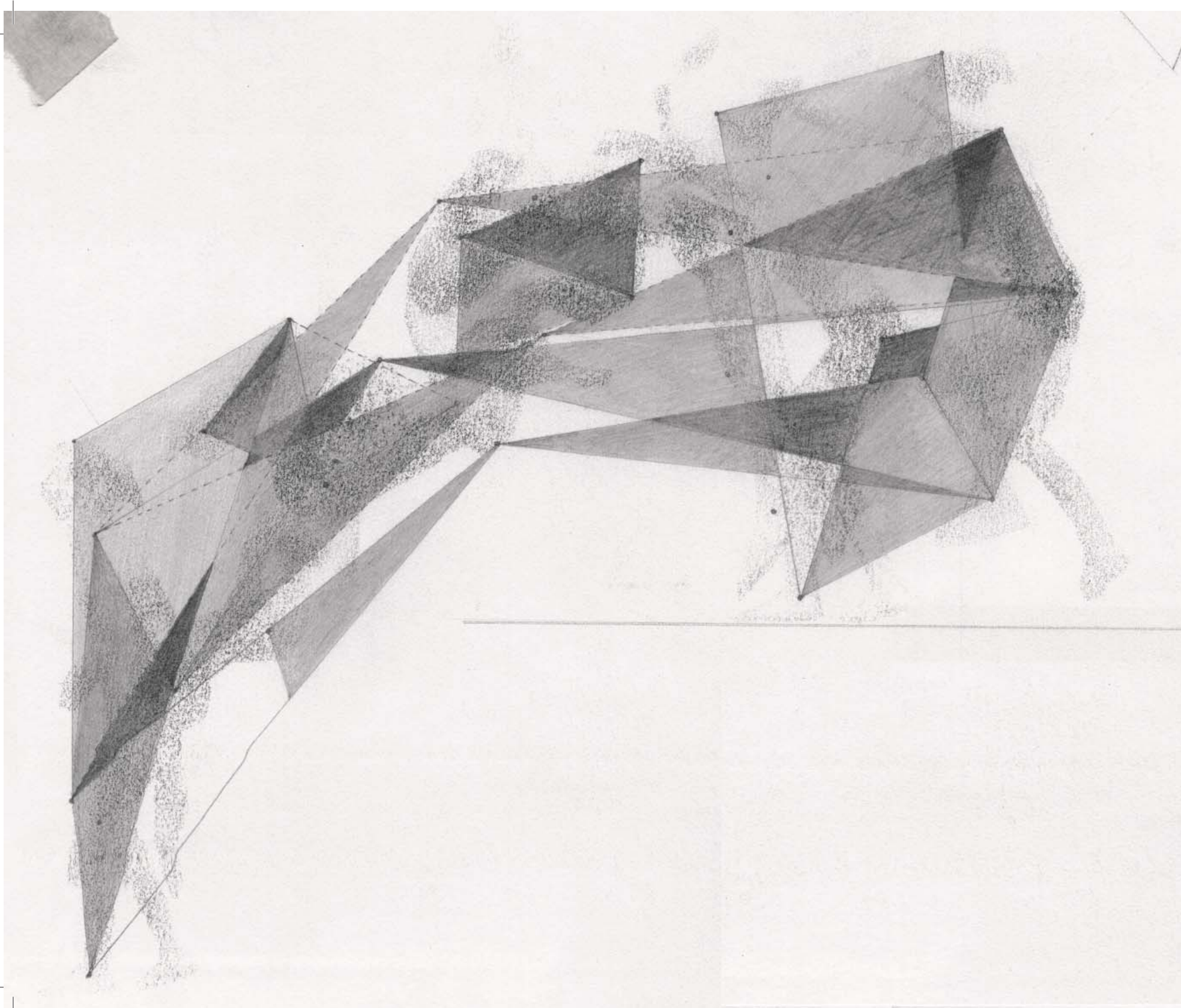
Experiment Nine
BOARD # TWO

Description:

This image depicts the same movement as the last image, where the gymnast is somersaulting from one height to another. Again forms from Jouffret's diagram have been appropriated but they have been filled with block shades of grey. The different shapes overlap and create a sense of depth.

Techniques/Influences:

Different qualities of the term iridescence were explored in order to create this latest image. Iridescence is an optical phenomenon in which the hue of a surface varies according to the changing angles which a viewer perceives the surface from.

For this exploration colour hues are not experimented with but rather the shifting grey tones of lead are investigated. The medium of the pencil was pushed, and block forms of overlapping shades were used in order to try and create the sense of iridescence.

This sense of overlapping is important to the Cubist ideal of simultainety.

Gyorgy Kepes investigated this sense of overlapping and the spatial effect that it creates. He believed that with overlapping forms the figures are 'endowed with transparency; that is, they are able to interpenetrate without an optical destruction of one another.'[1] The perceptual psychologist Rudolf Arnheim furthered this exploration with his own observations and says that he believes an overlap 'intensifies the relationships between forms, simultaneously comprising the complete form and the fusion.'[2]
Therefore by enagaging with the overlap of the fragmented forms the tension between the planes is heightened and the relationship between part and whole strengthened.

Relative Success:

There is one moment in the image which is interesting because it implies

significant depth or space. The planes of colour seem to recede into the board here. It is an interesting effect as it has been created with flat planes rather than shaded forms which a trompe l'oeil effect usually relies upon.

The major problem with this experiment is it is still relying too heavily on the Jouffret diagram to supply the composition for the image, rather than deriving it from the gymnasts movement. Again the planes have become arbitrary, the areas of these triangular forms are still quite large and therefore not able to reflect the subtleties of the motion.

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1   Kepes, Gyorgy in *Carlo Scarpa Layers,* China: Everbest Printing Company Ltd. 2007, pg 13

2   Schultz, A-C, *Carlo Scarpa Layers,* China: Everbest Printing Company Ltd. 2007, pg 13
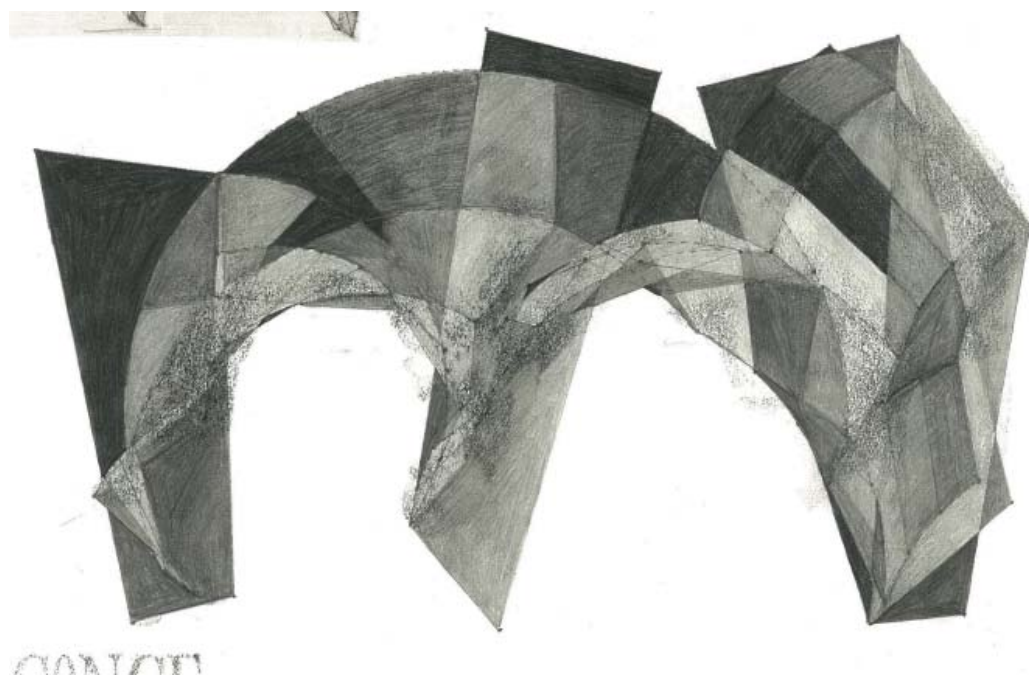
Experiment Ten
BOARD # TWO

Description:

For this experiment the image of the gymnast doing the flic flac was used.
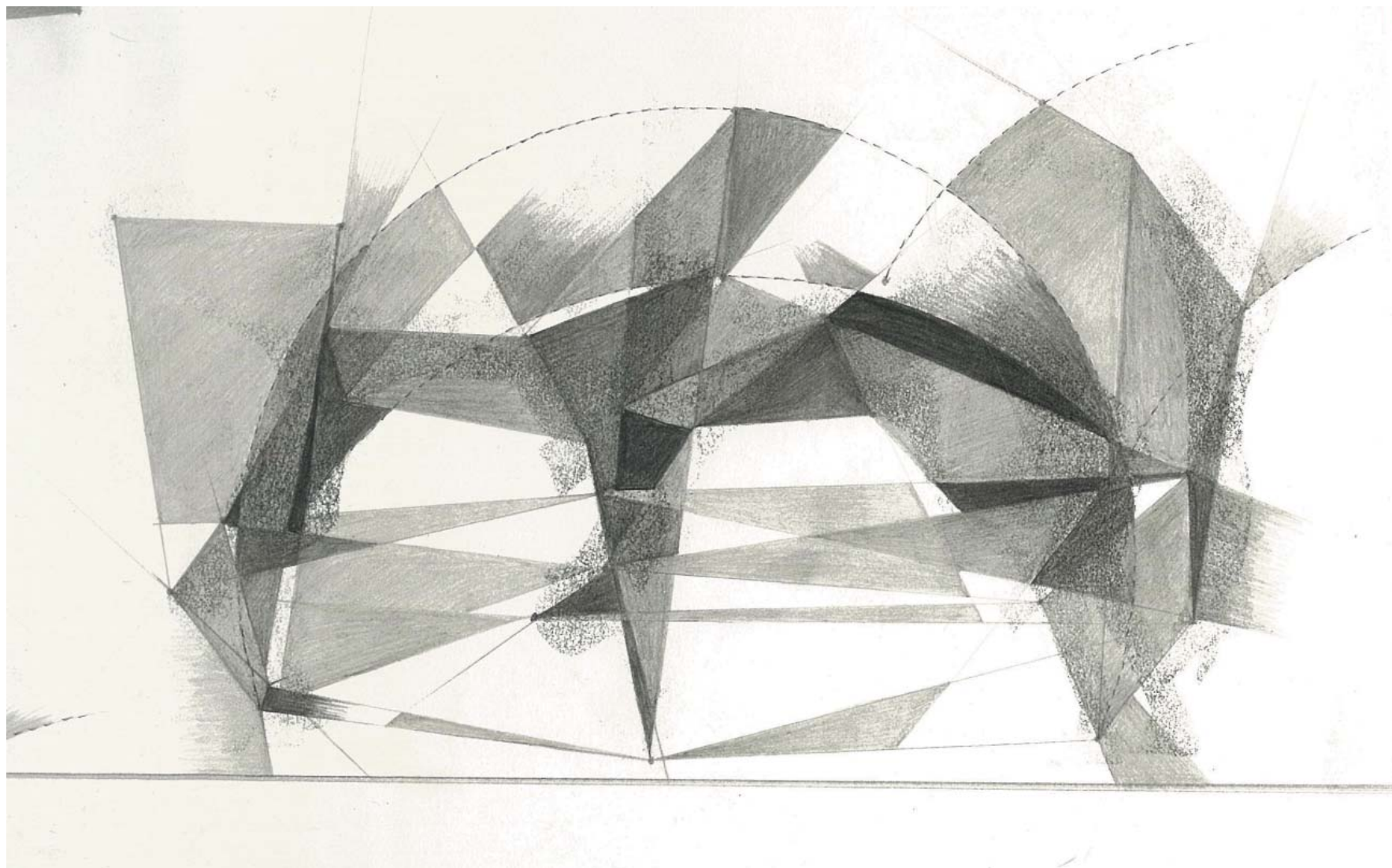
Techniques/Influences:

One of the problems from the last experiment was that the movement of the figure was being lost within the image. To try and counter this the movement lines derived from Etienne Jules Marey's technique has again been overlaid on top of the image. Using this technique means that smaller sections of the image have been broken down into shards of colour tone.

The image has then been rendered with a strong influence from Picasso's *Portrait of Ambroise Vollard.* Light tones have been used across the figures body where more overlap of movement occur the lightest shade is used. The tones then gradually fade to dark where there is less movement. This not only describes the movement but also gives the image a shimmering appeal.

Relative Success:

The figures movement is certainly clearer than the previous responses. However the technique of shading from light in the centre to dark surrounds is limiting. The image is now very contained within the space and therefore it cannot interact with the area around it.

Also the influence of the diagram and its shifting planes have become lost in this image as it reverts back to many of the simplistic techniques used in the last board.

Experiment Eleven
BOARD # TWO

Description:

Again the gymnast executing the flic flac has been used to try and create a more straight forward comparison between images.

Techniques/Influences:

This image was created to explore the middle-ground between the two previous depictions. The rendering technique used in the last experiment has been reversed so where the movement is strongest the heaviest tone is used. This change appears to be the logical choices as it allows more spatial interaction with the ground between and around the figure. The lighter shades around the movement can be smoothed into the board surrounding the image.

In the last depiction the sense of the overlap appeared to have been lost and the tension of the image faded as a result. As an attempt to remedy this the triangular facets, appropriated from Jouffret's diagram were once again engaged. However they although they were this time better integrated they still appear as a somewhat arbitrary response to the condition.

Relative Success:

The movement of the figure is once again beginning to be privileged in this experiment. The rendering technique used is highlighting the tension within the image, reflecting Cubist values.

The triangular forms within the image are confusing as they detract from the movement but it has become apparent that these facets are not necessary to carry through the ideas of tension and iridescence captured within Jouffret's diagram.
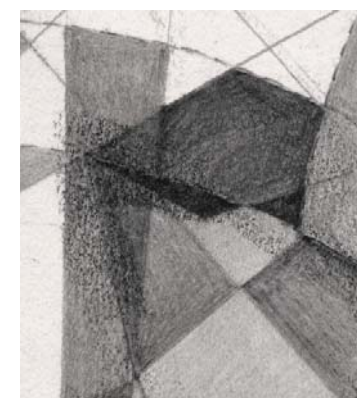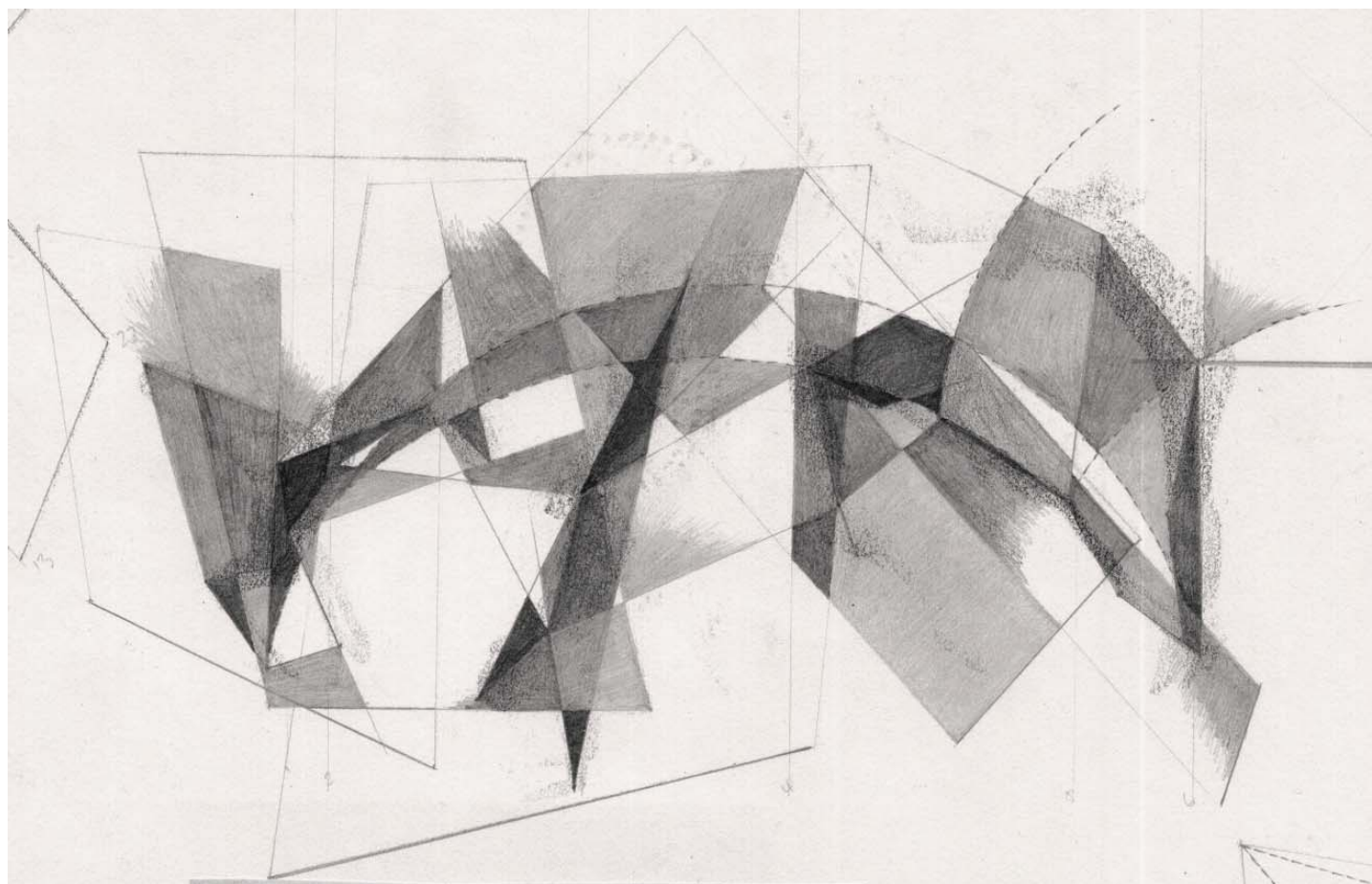
Experiment Twelve
BOARD # TWO

Description:

The same image was used again but this time applied within the planes derived from Jouffret's model.

Techniques/Influences:

The planes from the *perspective cavaliere* image were once again used after analysis of the previous experiement. The last depiction was not challenging the space, or the movement which is shown, therefore the planes were employed to create the more interesting lines throughout.

The faceted forms within the last image- although integration was attempted- were still found to be arbitrary spatial devices these were therefore removed. However the sense of the shifting planes, which these forms imbue, was still a desired quality and therefore the image was rendered in order to try and capture this quality.

 Relative Success:

There are some beautiful moments within this image, where the overlap of figures creates moments of intensity. However the fragmentation could be taken further in order to create the tension sought.
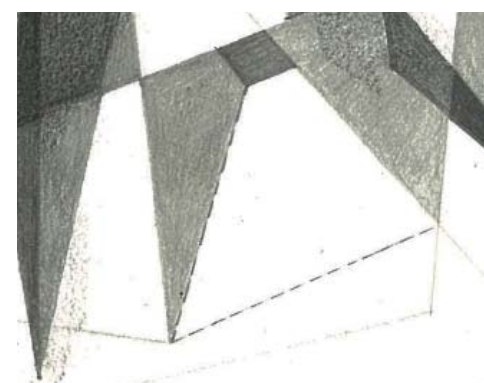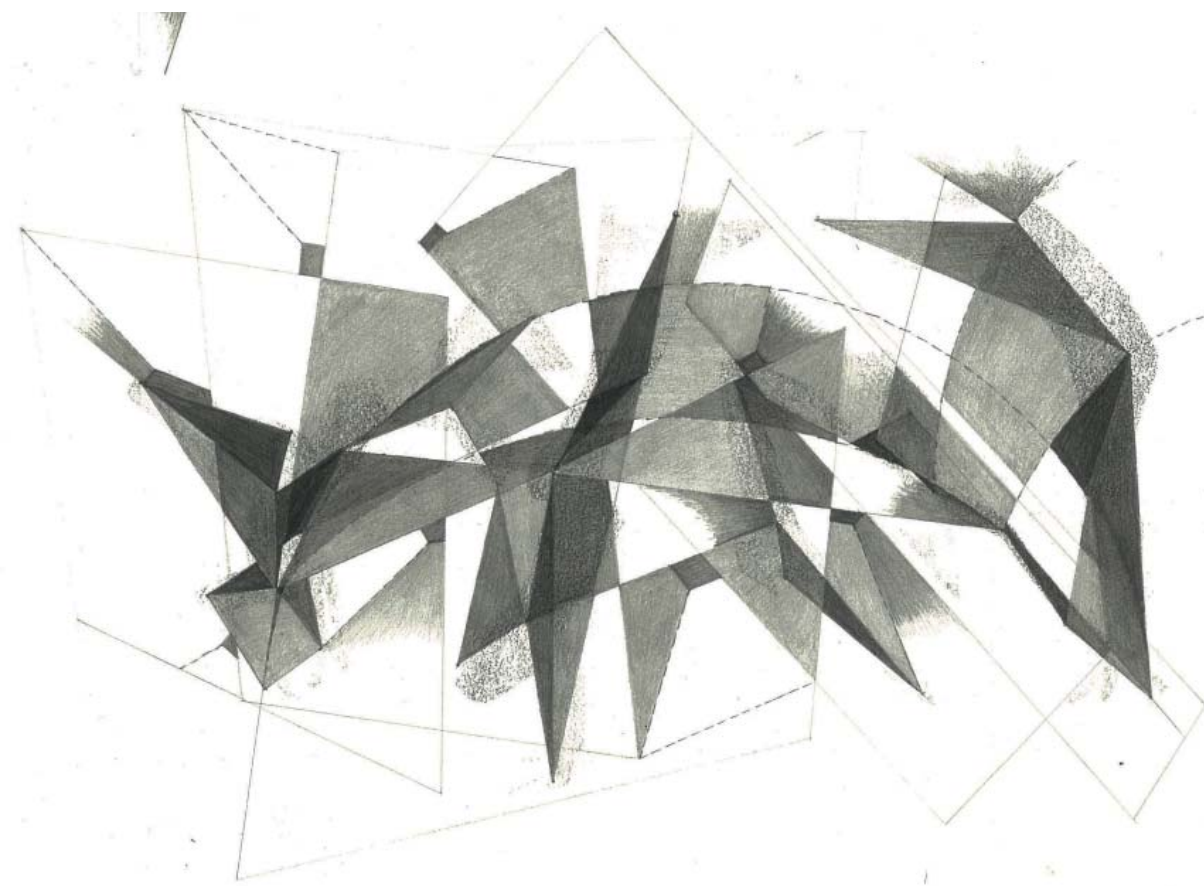
Experiment Thirteen
BOARD # TWO

Description:

This last experiment used the same subject matter as the previous three images but this was the culmination point of those explorations.

Techniques/Influences:

The same compositional techniques were applied to create this image but the fragmentation was taken further. The fragments of tone were arranged so it appeared that the space receded into the depth of the page.

Again the drawing was rendered using block of colour but this time the space around the figure was engaged with. Dotted lines-taken from Jouffret's image-represent the primary movements of the body and lines which were added in order to form depth.

Relative Success:

This image has used Cubist techniques but distorted them until they appear as a reconfigured interpretation. The motion of the figure is still visible but also movement has been evoked within the image. The translation of this drawing into three dimensions would be create an architecture still possessing the virtues of bodily movement.
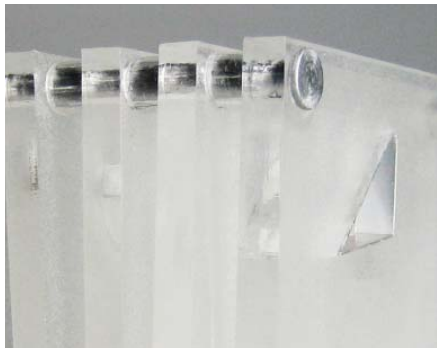
Appendix Two

This appendix documents the models made while carrying out this project.

The first two models shown were created in the spacemaking stage, before the final form of translation was settled upon.

The second set of models were made for the architectural fragment stage. These models represent the qualities searched for in this later stage of the project. They were created in a effort to describe and explore the physical manifestation of these qualities, and the potential that they hold when they are converted to three dimensions.

MODELLING EXPLORATION *one*

Pablo Picasso, Violin, 1915, Construction of painted
metal and wire, Musee Picasso, Paris.
From Ingo F. Walther, *Picasso: Genius of the Century*

The first modelling trial within this spacemaking stage was to convert the drawings into a three dimensional form using a method which mirrored Picasso's development into three dimensions. In 1915/16 Picasso did a series of sculptural studies based upon musical instruments. These were very similar to his investigations with collage but the materials began to fold out from the surface. These relief sculptures were created as logical consequence to the explorations he had been forming in his drawings.[1]

The strategy used to create the sculpture shown here was to generate the forms as if the drawing which it is based upon had simply erupted from the page. The most dramatic gestures within the drawing were pulled to the forefront and layered upon the more gentle moments.

A second colour of paper was used sparingly to accentuate the model in places and provide more depth.

This method was not continued as it did not offer further possibilities for design. The characteristics that the drawings possessed, in particular the tension within the depths of the image, was lost through the solid appearance of the materality within this experiment.

1   Walther, Ingo F. *Picasso, Genius of the Century*, Koln: Taschen, 2000, pg 46

MODELLING EXPLORATION one
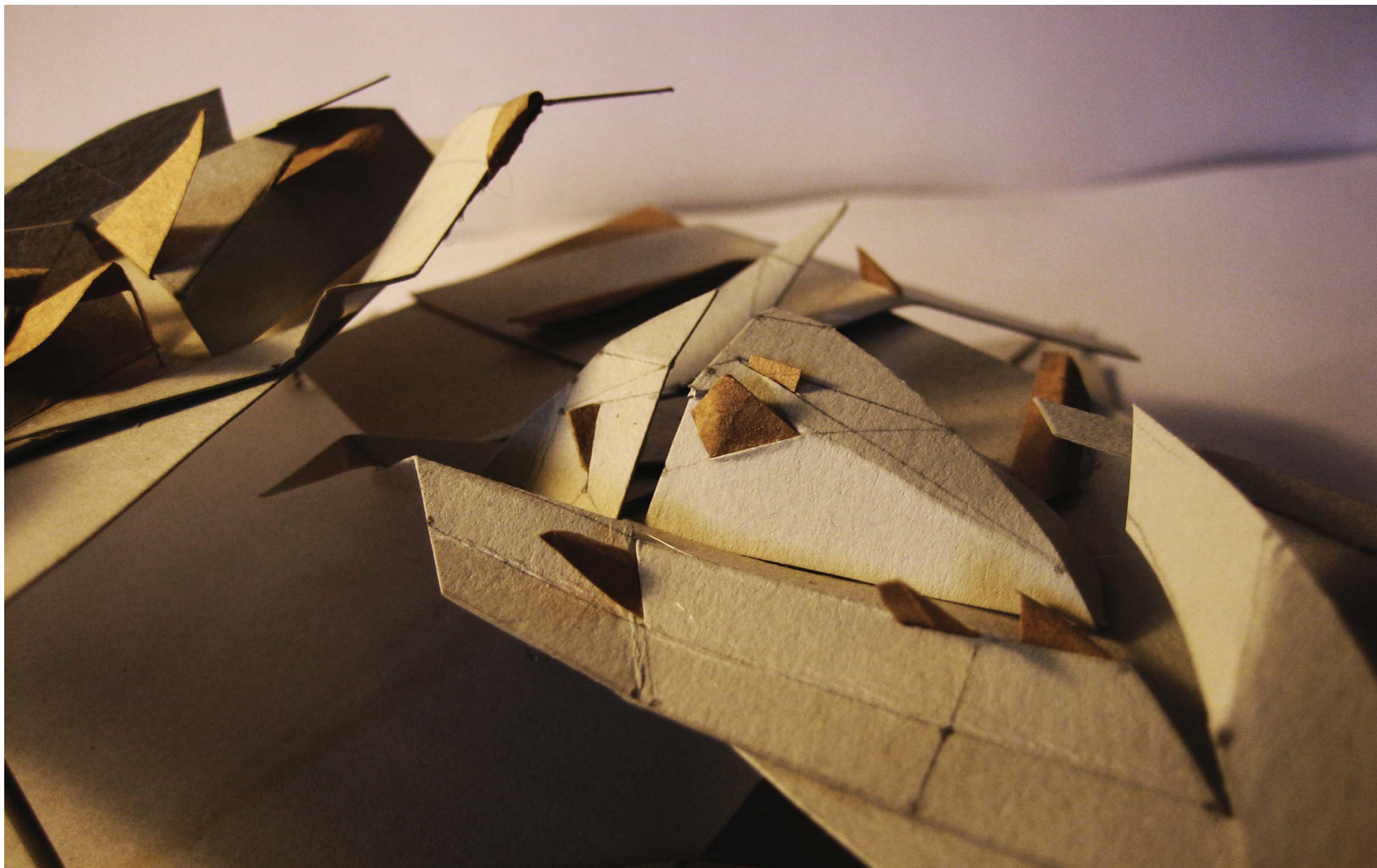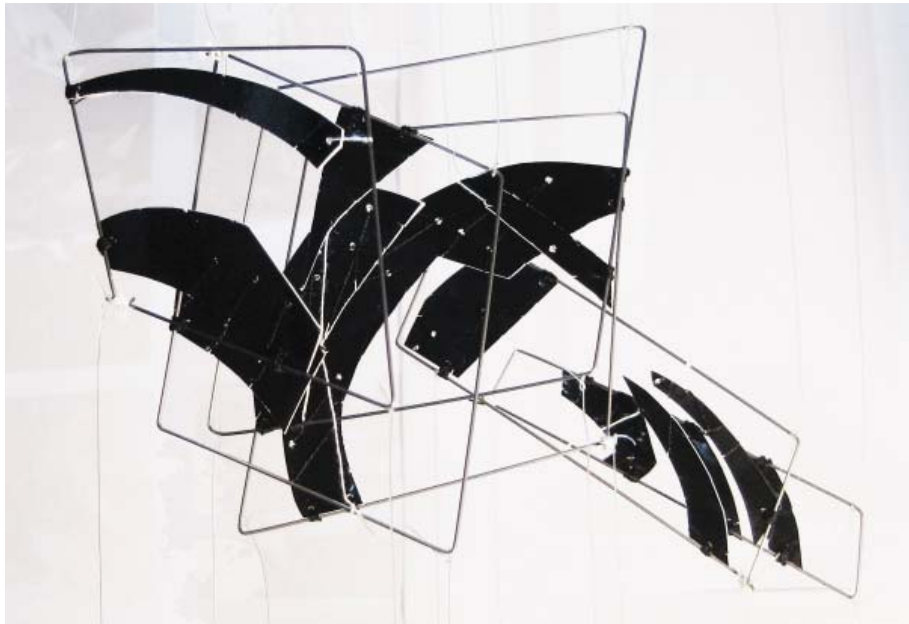
This second trial took a different approach. These models were again created as a bridge between the drawing and architecture stages. This attempt instead looked at Rowe and Slutzky's text for inspiration in the conversion to architecture. The prominent characteristics that the authors described within the Villa at Garches were sought.

The quality of phenomenal transparency was first engaged here. The drawing which generated the study was initially dissected and again the most dramatic gestures within it was recorded. These moments were selected as they seemed to best describe the movement that they were created from.

Depth was engaged when these different moments were placed upon different planes and new relationships appeared within the superimposition.
The final model was composed within wire outlines, which recalled Jouffret's four dimensional diagram, as it was used to arrange the drawings.
Finally black thread was sewn within the forms of the models. This added a secondary layer of information derived from the multitude of lines which make up the drawing.

Although this modelling technique began to describe a form which the final architecture could take, the make up of this model was fairly constricting in terms of translation. The physicality of the sculpture would have restricted the architectural response. This form of modelling was not continued and instead the process turned to the digital extrusion process.

MODELLING EXPLORATION *two*
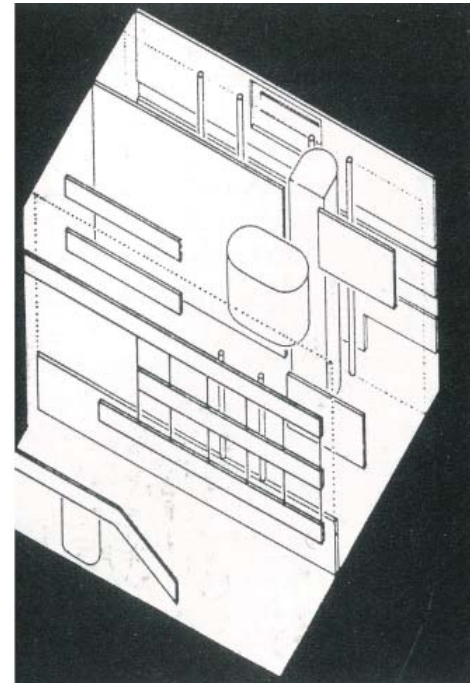
Colin Rowe, Robert Slutzky, Transparency Analysis of the Villa Garches, interior
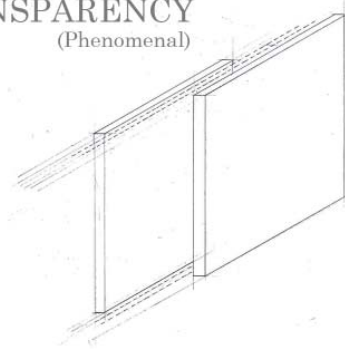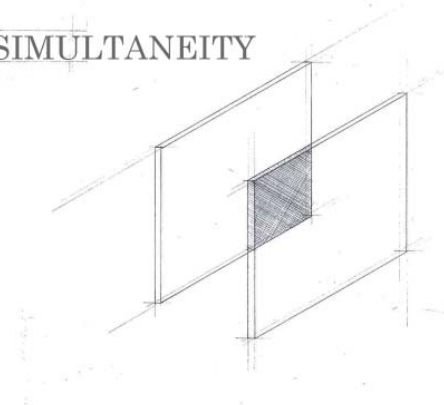From Anne-Catrin Schultz, *Carlo Scarpa: Layers*

PLANARITY
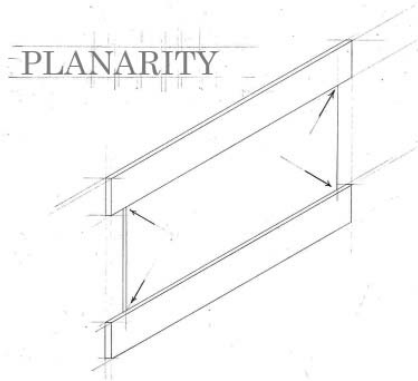
TRANSPARENCY
(Phenomenal)

SIMULTANEITY

FINAL MODELS

In these studies the three qualities recognised in both Cubism and architecture; Planarity, Simultaneity, and Phenomenal Transparency, are explored. Each of the attributes are very similar, usually dealing with the superimposition of entities, however they take subtly different forms when converted to three dimensions.

The image created to the left was the first attempt to physically define these elements from one another. To further clarify these ideas models were created. The influence of Le Corbusier's Villa is evident in their material palette and composition. The next pages will document the results of this study.

This study is based on my understanding of Phenomenal Transparency. This model applies directly to the seat intervention, which was designed for the train station.

It shows the virtually opaque plastic planes which have been distorted according to the forms placed within them. The metal forms are not easily viewed within the seat but tension has been captured through the implication of these moments.
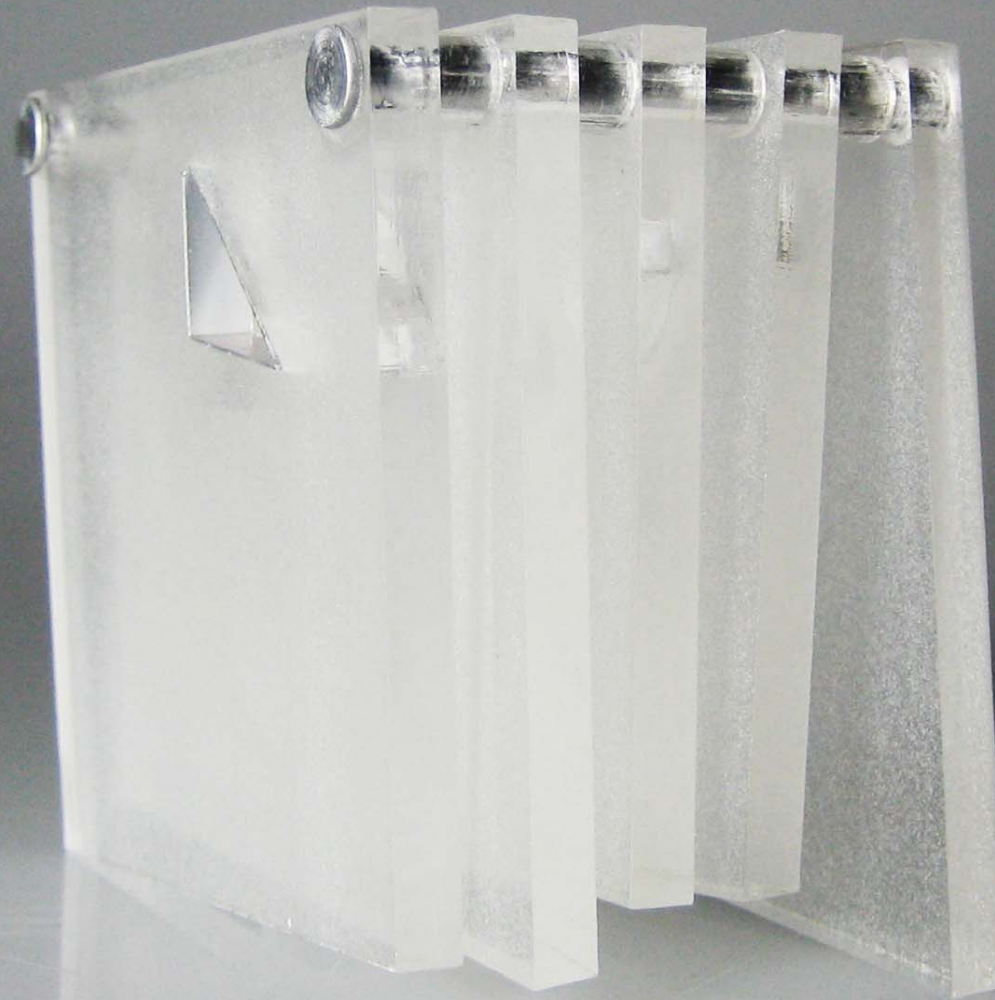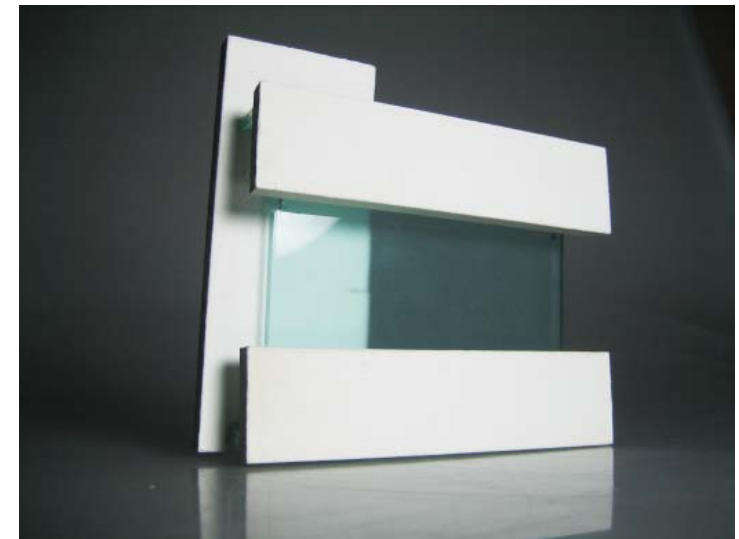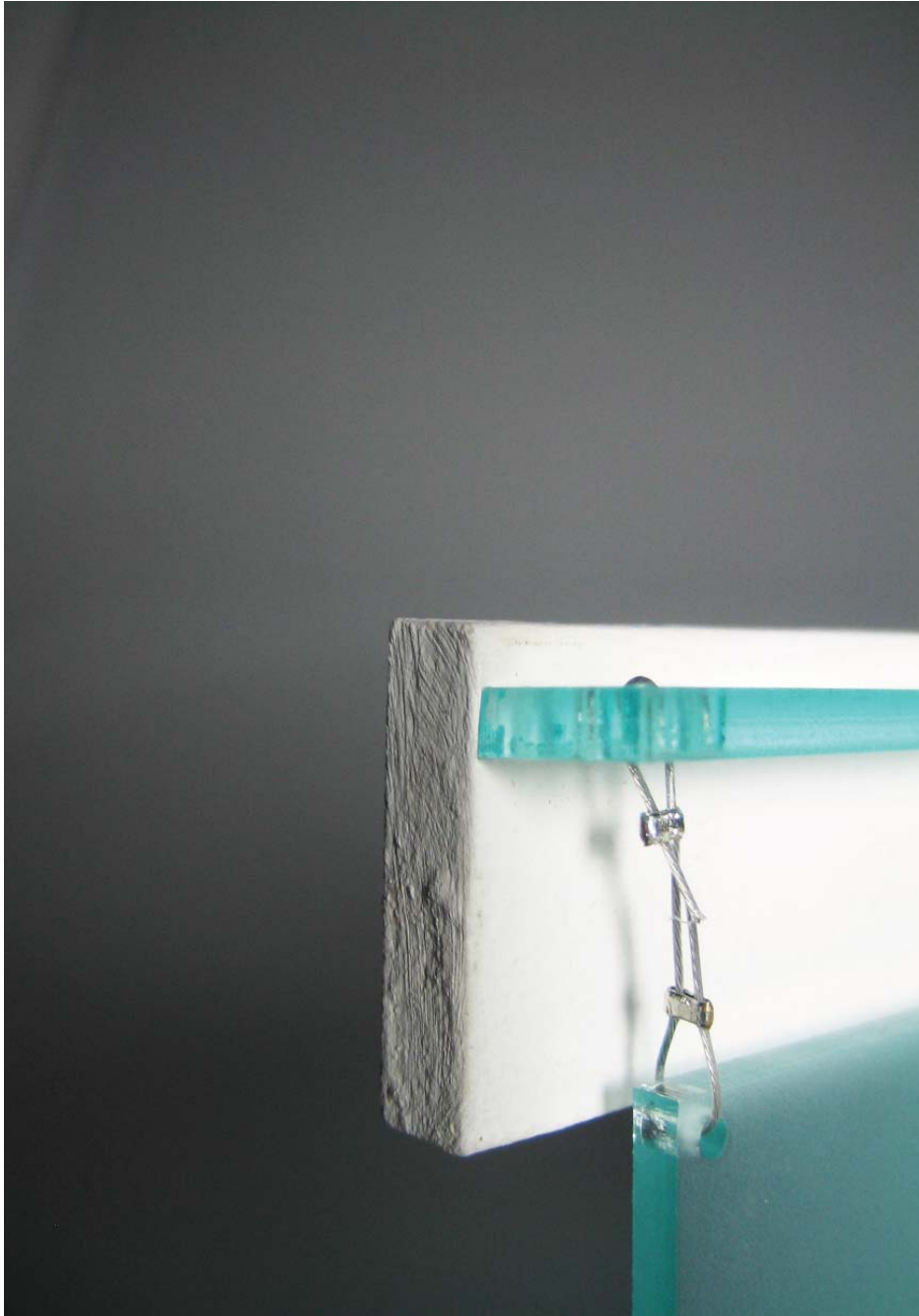
This model shows the material characteristics of Planarity. The blue plane which hovers in between the white ones is reminiscent of Le Corbusier's glazing bands within his Villa. The connection between these elements is tensile and pulls at the plane, reinforcing the notion of its planarity.
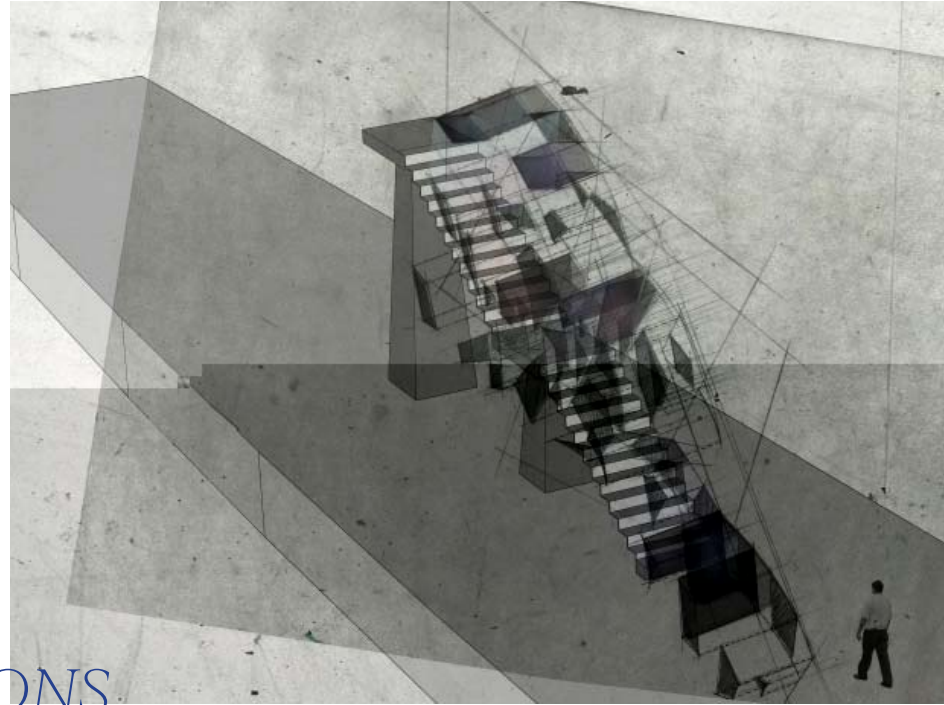
This model shows the interaction of many different planes and materials. It represents Simultaneity and shows how the overlapping of two different entities can strengthen the appearance of the contributing elements. The 3 embedded within the plaster plane recalls the concrete platform with its numbers cast along one edge.
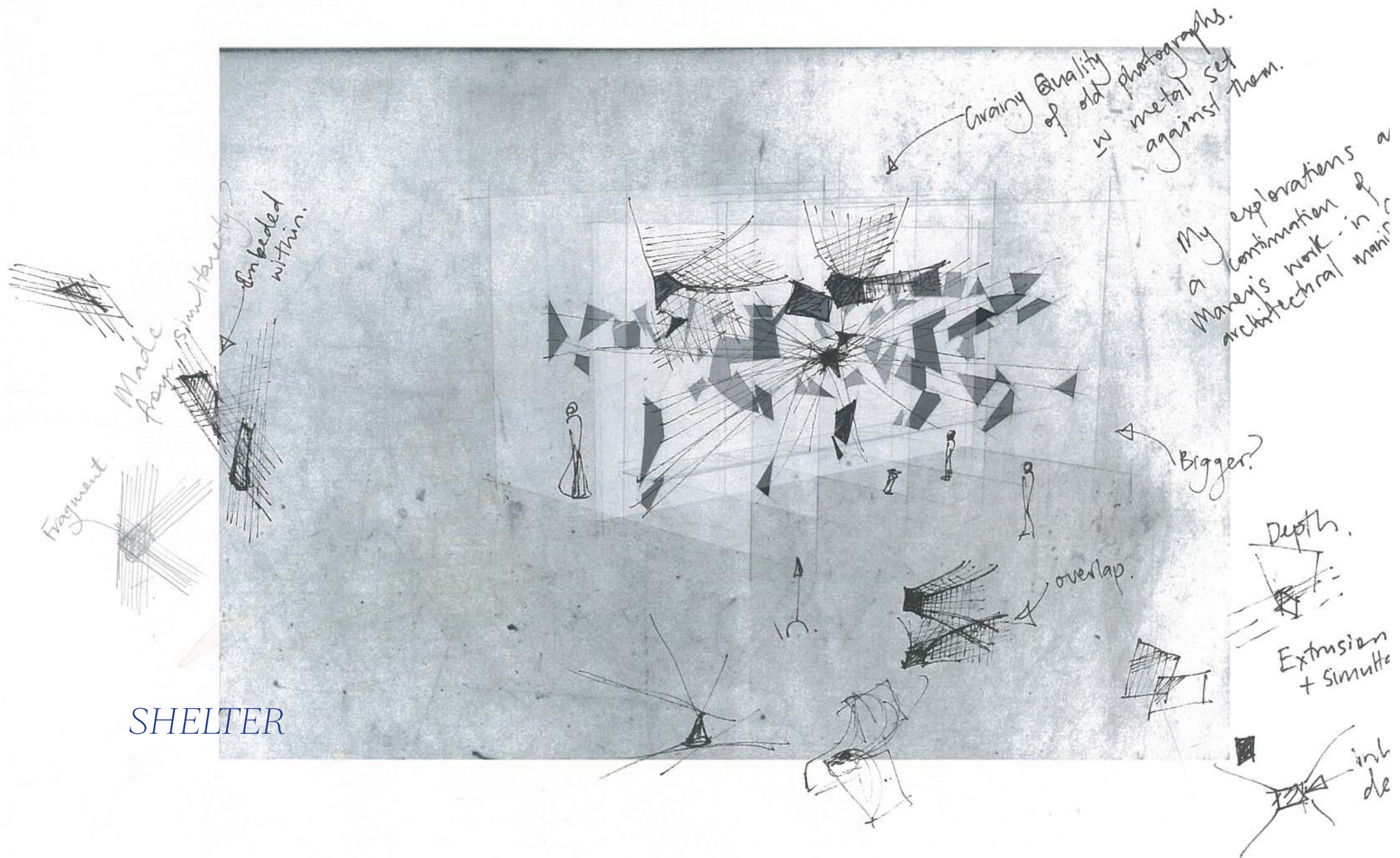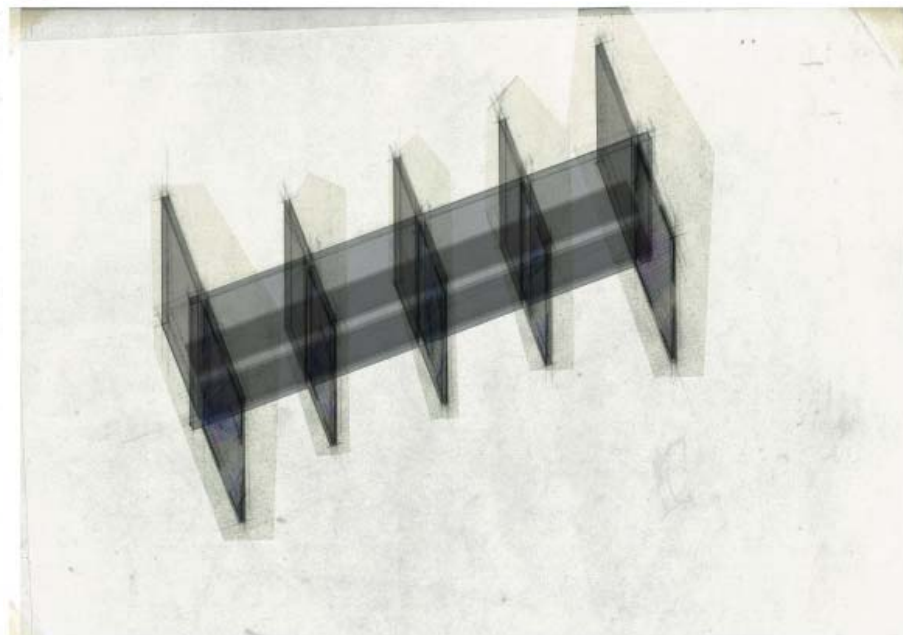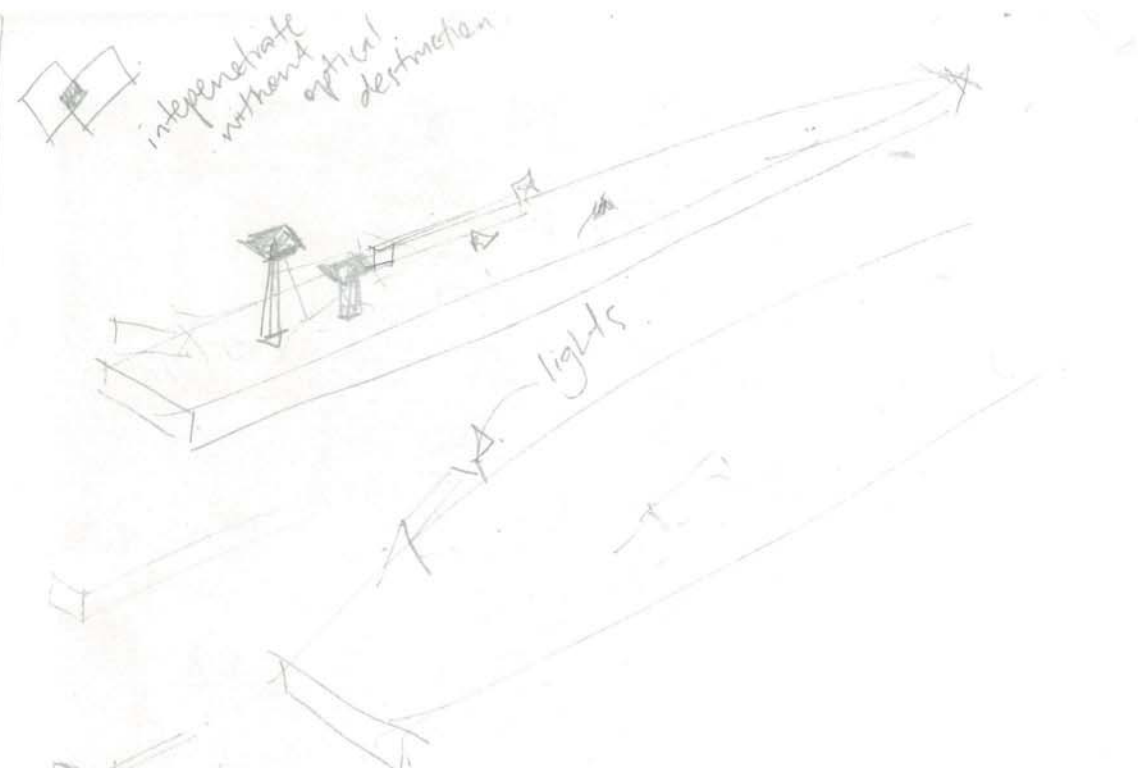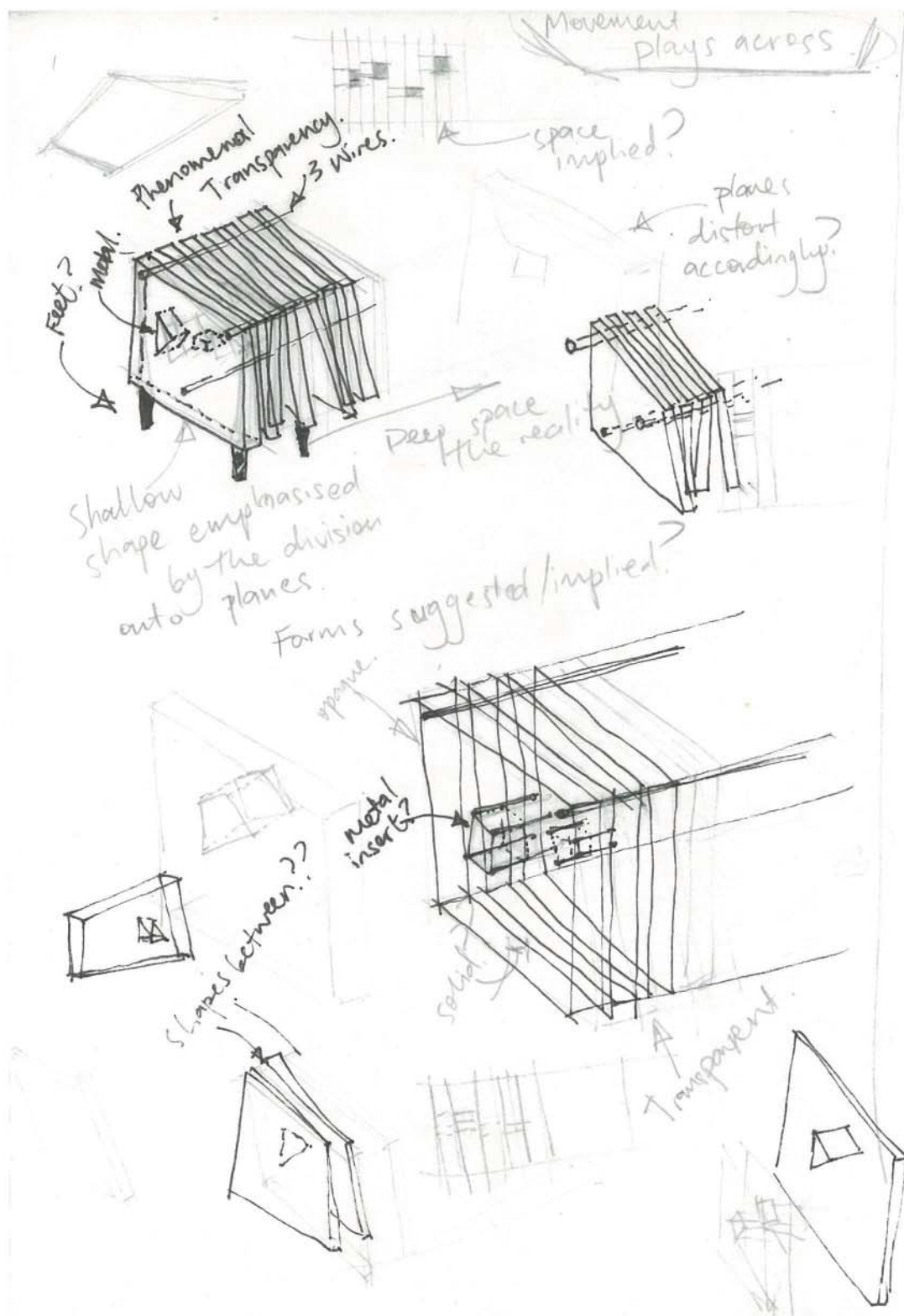
Appendix Three

This final document simply records some of the overflow of images created in carrying out this process. Many of them are no more then a page of sketches drawn while planning the conversion to architecture, others are design schemes which were not followed to completion. Many of the images were followed through to a semi complete level, built up through the various mediums from which they were constructed. These images describe the many different stages of the design process and show the parallels between this method and Scarpa's strategies.
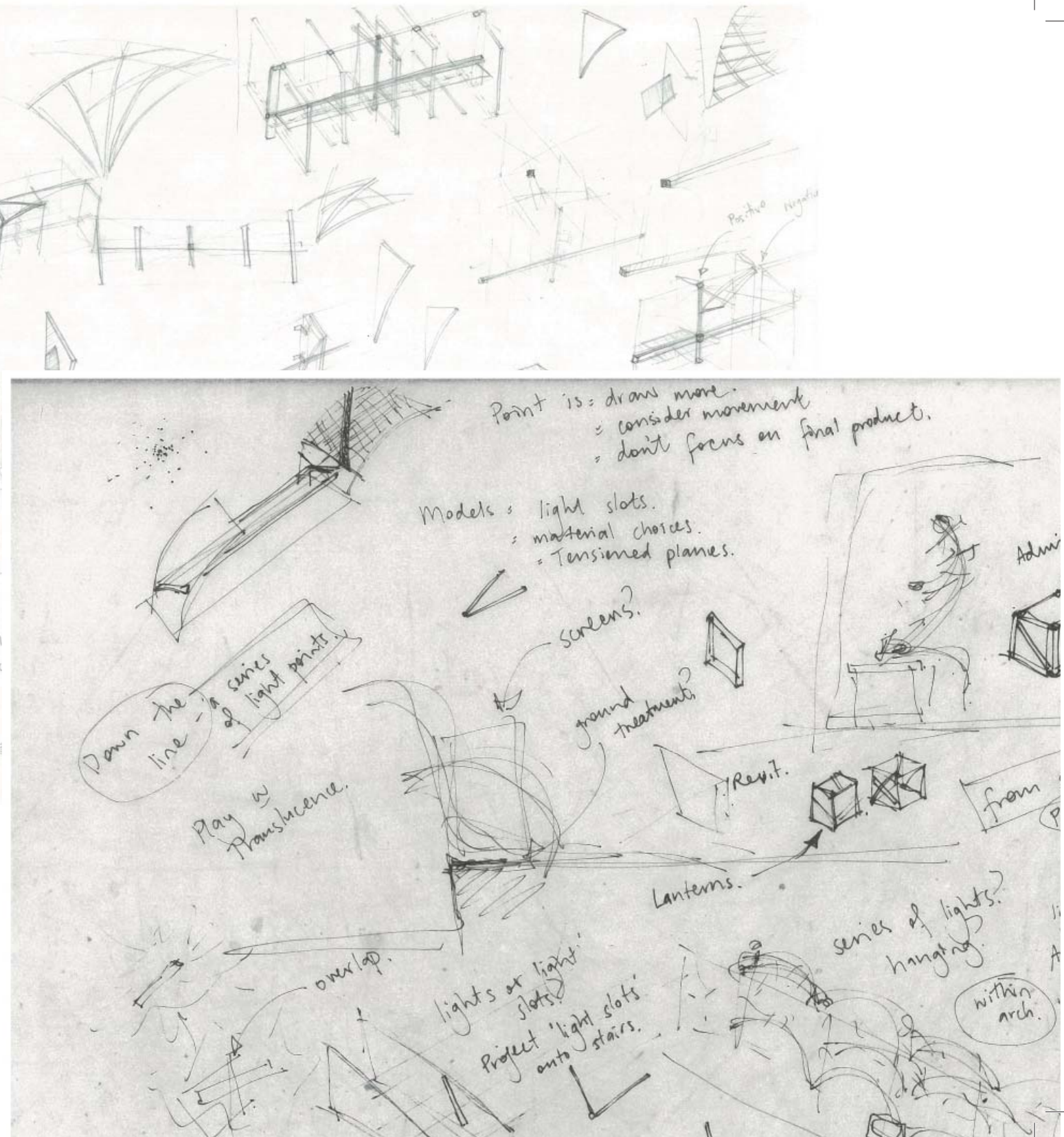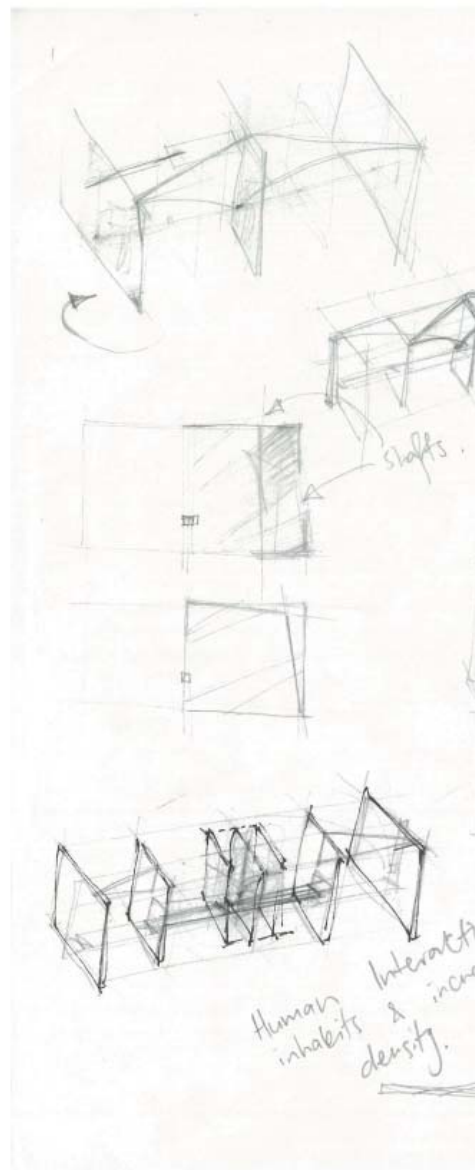
STAIRCASE EXPLORATIONS

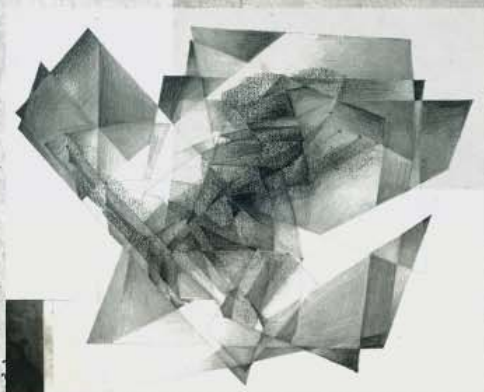Grainy Quality of old photographs.
w metal set against them.

My explorations a
a continuation of
Maney's work - in
architectural mani

Embeded within.

Made
from simultaneity?

Fragment.

Bigger?

Depth.

overlap.

Extrusion
+ simulta

int
de

SHELTER

Movement plays across

Phenomenal Transparency. 3 wires.

space implied?

planes distort accordingly?

Fact? matl.

Feet?

Shallow shape emphasised by the division onto planes.

Deep space the reality

Forms suggested/implied.

interpenetrate without optical destruction

lights.

opaque

metal insert?

solid

shapes between??

Transparent

slots.

Human Interacts & incr... density.

Point is: draw more.
= consider movement
= don't focus on final product.

Models : light slots.
= material choices.
= Tensioned planes.

Down the line — a series of light points

Play w Translucence.

screens?

ground treatments?

Revit.

Lanterns.

overlap.

lights or light slots?
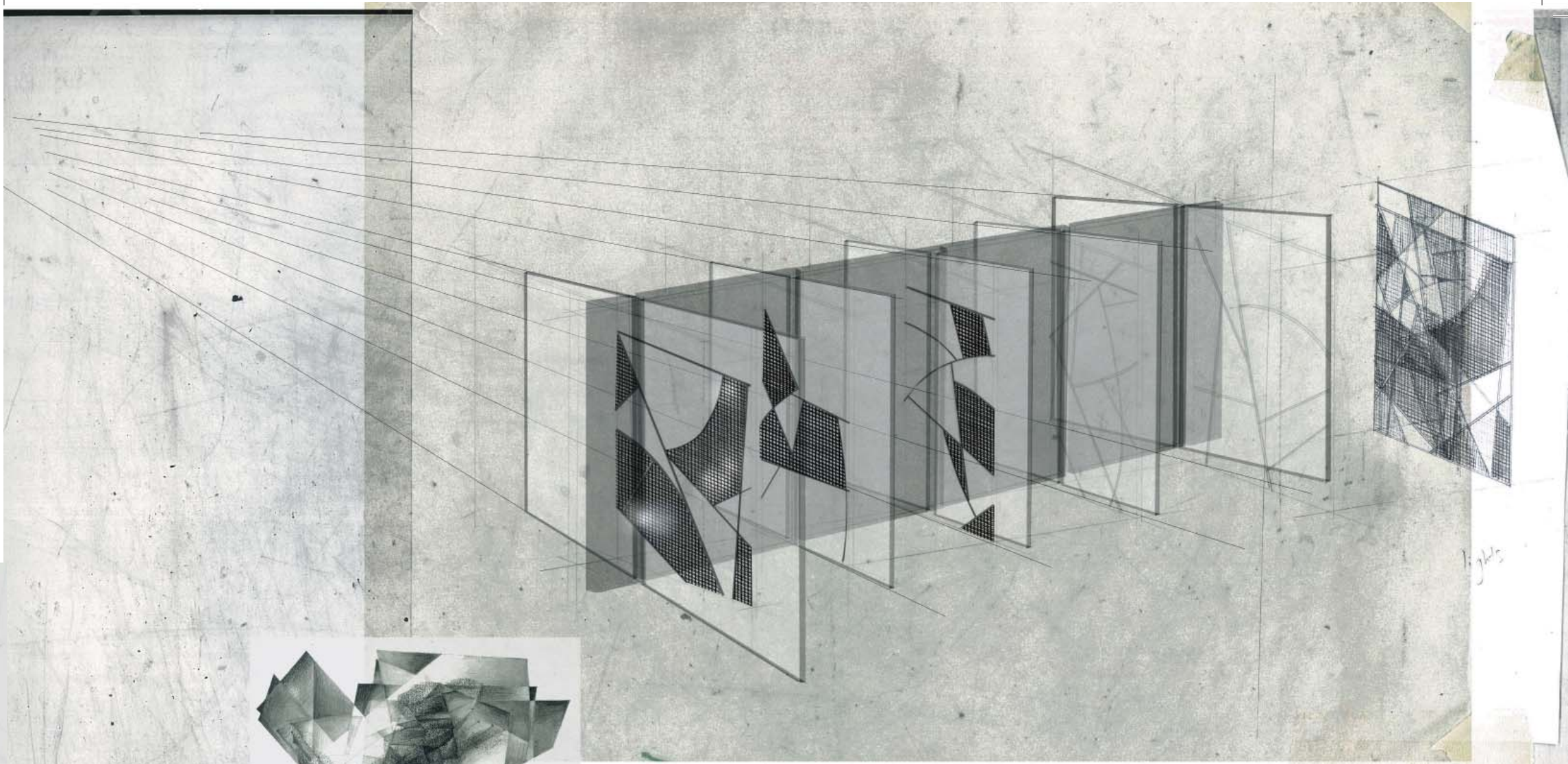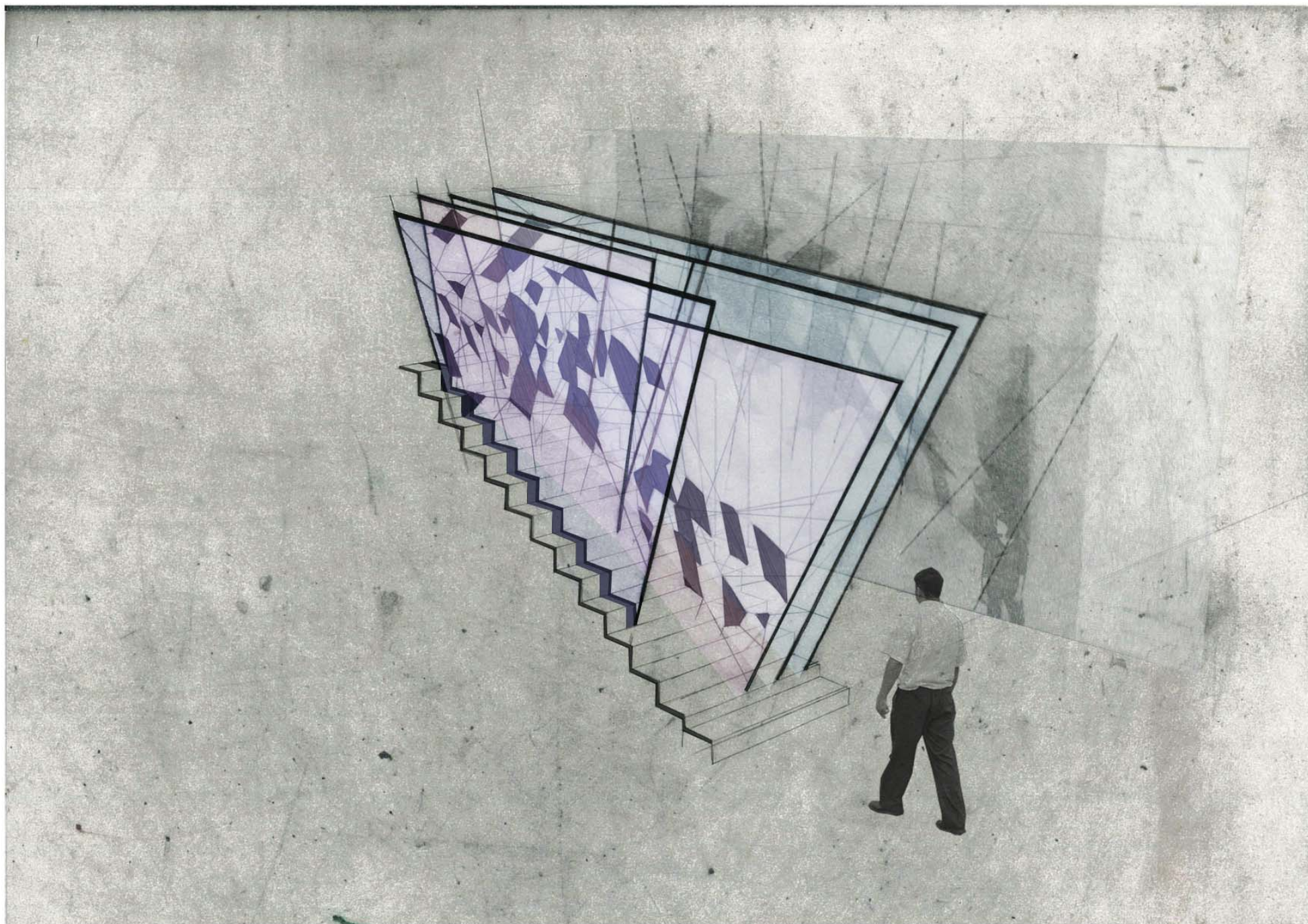
Project 'light slots' onto stairs.
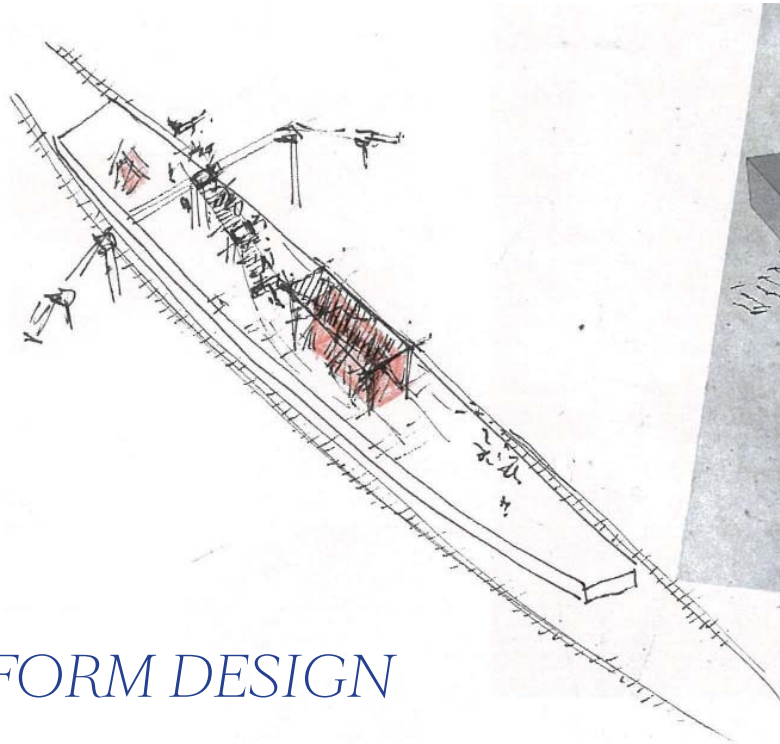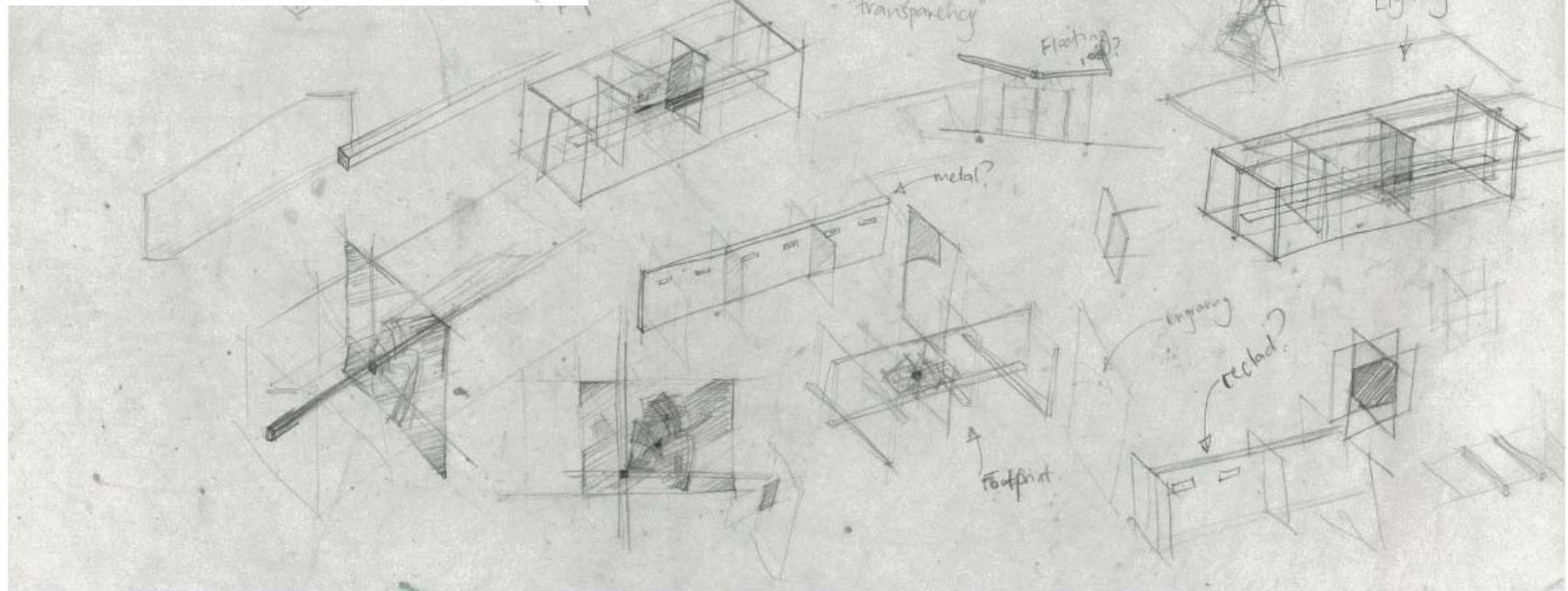
series of lights? hanging.

within arch.

DRAWING PROCESSES

lights

PLATFORM DESIGN

EXTRUSION STUDY