



Ark: Pursuing qualities of relation through a provisional compositional taxonomy

A thesis submitted in (partial) fulfilment of the requirements for the degree of Doctor of Philosophy.

Michael John Davis

BArch (*Hons*) (Auckland), MArch (*AADRL*, London).

School of Architecture and Design

College of Design and Social Context

RMIT University

July 2014

Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis/project is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

Michael John Davis

03 April 2015

ARK: PURSUING QUALITIES OF RELATION



Michael Davis
July 2014
RMIT University

A Thesis submitted in (partial) fulfilment of the requirements of the Degree of Doctor of Philosophy.

Michael Davis
BArch (*Hons*) (Auckland), MArch (*AADRL*, London), ANZIA

School of Architecture and Design
RMIT University
July 2014

Declaration:

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

Signed:

Michael Davis

Dated:

For Iyla and Noah

Acknowledgments:

I wish to thank all who assisted me in the preparation of this dissertation. I owe a deep debt of gratitude to my supervisor, Associate Professor Pia Ednie-Brown for the sensitivity and patience with which she helped me navigate this journey. Thank you to my co-supervisor, Professor Peter Downton for his insight and for the precision of his interjections along the way. Thank you also to Brent Allpress who has backed me enthusiastically from start to finish. I also wish to express my gratitude to Jondi Keane and Suzie Attiwill for their critique and sustained encouragement.

I am grateful for the support extended to me by my colleagues at the University of Auckland; particularly that of Associate Professor Sarah Treadwell and Kathy Waghorn who gave generously of their time, energy and critical expertise. Thanks also to Mike Linzey and Peggy Deamer for their input at the outset, and Julia Gatley for her help at the end. I appreciate the efforts of Sajeew Ruthramoorthy, Ian Scott, Patrick Loo and Liz Campbell who assisted in different ways at different times with the preparation of drawings and photographs presented in this dissertation.

Thank you to John and Barbara for opportunity and encouragement. I am especially grateful to Vanessa for her love, patience and support.

CONTENTS

ABSTRACT	7
GLOSSARY	8
INTRODUCTION	11
Chapter 1: EMERGENT ARCHITECTURE AADRL and its ongoing implications in the work of Ark	27
Chapter 2: TENSION An emergent quality of the design project ecology	51
Chapter 3: PROVISIONALITY The provisional compositional taxonomy	73
Chapter 4: POISE Pursuing the emergent	101
CONCLUSION	113
BIBLIOGRAPHY	120

ABSTRACT

The vehicle for this doctoral research is Ark, an architectural practice that, having passed through the AADRL in London, has been returned to New Zealand and the particular lineage of modernist tectonics from which it stems.

The research responds to problems that emerged through encounters with two different modes of architectural education: one at the University of Auckland, and the other at the Architectural Association in London. Priority in the design studio at the University of Auckland between 1990 and 1994 was given to a kind of architectural composition that consisted of parts set in relation to other parts, an approach seen here as typical of work in the field of 'modernist tectonics'. There was little discussion in the studio of the design process that brought parts and relations into being, nor was there discussion of the importance of practices of making, despite the attention given to beautifully made drawings and models.

On the other hand, at the Architectural Association's Design Research Laboratory (AADRL) between 2001 and 2003 focus fell on the design process. It foregrounded making with a range of media at different scales in the development of 'geometric/material systems'. These systems were deployed in ways that underlined their capacity for constant adaptation. Design outcomes were just particular configurations of a system at a moment in a continual design process. In the time since, work of this nature has been deemed to belong to the field of 'parametricism'.

This research questions and explores whether these two emphases – respectively, the composition of tectonic parts and the ongoing process of formation – can be reconciled within the one approach to architectural design. The enquiry progresses through the deployment of a compositional taxonomy that reflects on five of Ark's design projects. It sets out to identify compositional characteristics inherent in the projects through which a dialogue between the tectonic and parametric might be established.

The dissertation articulates a story of the work, the research and the practice through two volumes. *Ark: A Provisional Compositional Taxonomy* presents generalised diagrams about Ark's compositional taxonomy followed by documentation of each project on the terms it establishes. *Ark: Pursuing Qualities of Relation* is a discussion of design process that reflects on the five projects and the compositional taxonomy itself. The dissertation is accompanied by a video recording titled *Ark: pursuing qualities of relation through a provisional compositional taxonomy*. It records an exhibition of Ark's work and its presentation to show how each field is informing the other at this stage in the life of the practice.

GLOSSARY

EMERGENCE: Broadly, emergence is a model that pertains to how forms of organisation arise. It explains the coming-into-being of things not as the result of a single action, or central controlling force, but as the result of an aggregation of multiple, small actions, often related by simple rules.

TAXONOMY: Within the sciences and in biology especially, 'taxonomy' is understood to be the technique of classification¹ while 'a' taxonomy is a single scheme of classification. In medicine it is "the classification of organisms in an ordered system that indicates natural relationships."² This definition runs close to the manner in which it is used here. In architecture taxonomy tends to focus on the classification of forms and their composition through annotated diagrams, drawings and images.

COMPOSITION: Generally, 'composition' is used to denote both "the act of combining parts or elements to form a whole" and "the resulting state or product"³ of the act of composition. Composition is a concern that is central to architectural design. However, in different fields of the discipline it operates under different names and with different degrees of articulation. For instance, there are significant differences in the way the issue of composition is articulated in modernist tectonics relative to the way it is articulated in parametricism. Modernist tectonics holds composition (as a noun) as an explicit concern in that it involves parts and how those parts go together. However, composition as a verb – an activity that leads to the beautifully made artefacts the field emphasizes – receives scant attention. With parametricism traditional concepts of composition are encompassed within concepts of "organisation" and "articulation".⁴ The idea of 'organisation' in terms of composition is particularly relevant here as it seems to bring relations between things into the same frame of consideration as the things themselves. This research is concerned with 'composition' as both (verb) the bringing of parts into relation, and (noun) the outcome of that process. In the final analysis here focus falls on the qualities of relations between the parts more than the parts themselves.

COMPOSITIONAL TAXONOMY: Ark's taxonomy is concerned with the classification of compositional parts and relations at play in a selected body of work. It examines five different architectural design projects and classifies the different parts discerned in each into six different categories or types. These are termed "primary compositional parts". It then shifts its attention to qualities of relation between the parts. It demonstrates the persistent presence of three particular kinds of relation – tension, provisionality and poise.

1 taxonomy. <http://dictionary.reference.com/browse/taxonomy?&o=100074&s=t> (accessed 17.02.15, 8.49am).

2 taxonomy. Dictionary.com. The American Heritage® Stedman's Medical Dictionary. Houghton Mifflin Company. <http://dictionary.reference.com/browse/taxonomy> (accessed: February 16, 2015).

3 composition. <http://dictionary.reference.com/browse/composition?s=t> (accessed 17.02.15, 8.45am).

4 Patrik Schumacher, *The Autopoiesis of Architecture, Volume II: A New Agenda for Architecture* (Chichester: J. Wiley, 2012), 50.

TENSION: *The Concise Oxford* provides an idea of tension as a "strained (political, social, etc.) state or relationship."⁵ Tension here denotes a particular quality of relation between (often multiple) parts of an architectural composition. It is a sense that the parts pull in different directions while remaining often uncomfortably bound together. It involves a level (however slight) of disharmony where the parts don't feel quite right together.

PROVISIONALITY: 'Provisionality' is "providing for immediate needs only, temporary"⁶ This research discusses provisionality in the relations between the parts of an architectural composition. It surfaces in the work as a feeling that the parts are temporarily 'held-in-suspense-with' one another, their relations being contingent upon something else, rather than feeling 'fixed-in-relation-to' one another.

POISE: Poise is understood here as "suspense or wavering, as between rest and motion or two phases of motion: the poise of the tides."⁷ Alternatively it might also be "to hold supported or raised, as in position for casting [...]: to poise a spear."⁸ Both illustrations suggest poise to be a condition experienced when something is set up in readiness to change. Poise is apprehended in relation to Ark's work as a condition experienced at thresholds. It is an experience of passing from one condition to another where the act of suspension (between the multiple parts and relations between them) is at its most dynamic.

Tension, provisionality and poise are themes central to this research. Through the work my understanding of them (almost as characters in a drama) became fuller. Accounts of their development are set out in the chapters of this volume. They are addressed concisely again in the prelude to the accompanying volume, *Ark: a provisional compositional taxonomy*. As outlined there, these qualities of relation are nested one within the other where qualities of tension lay down the conditions for provisionality which lay down conditions for moments of poise.

5 *The concise Oxford dictionary*, New Edition (Oxford, Oxford University Press, 1976), 1193.

6 *The concise Oxford dictionary*, New Edition (Oxford, Oxford University Press, 1976), 894.

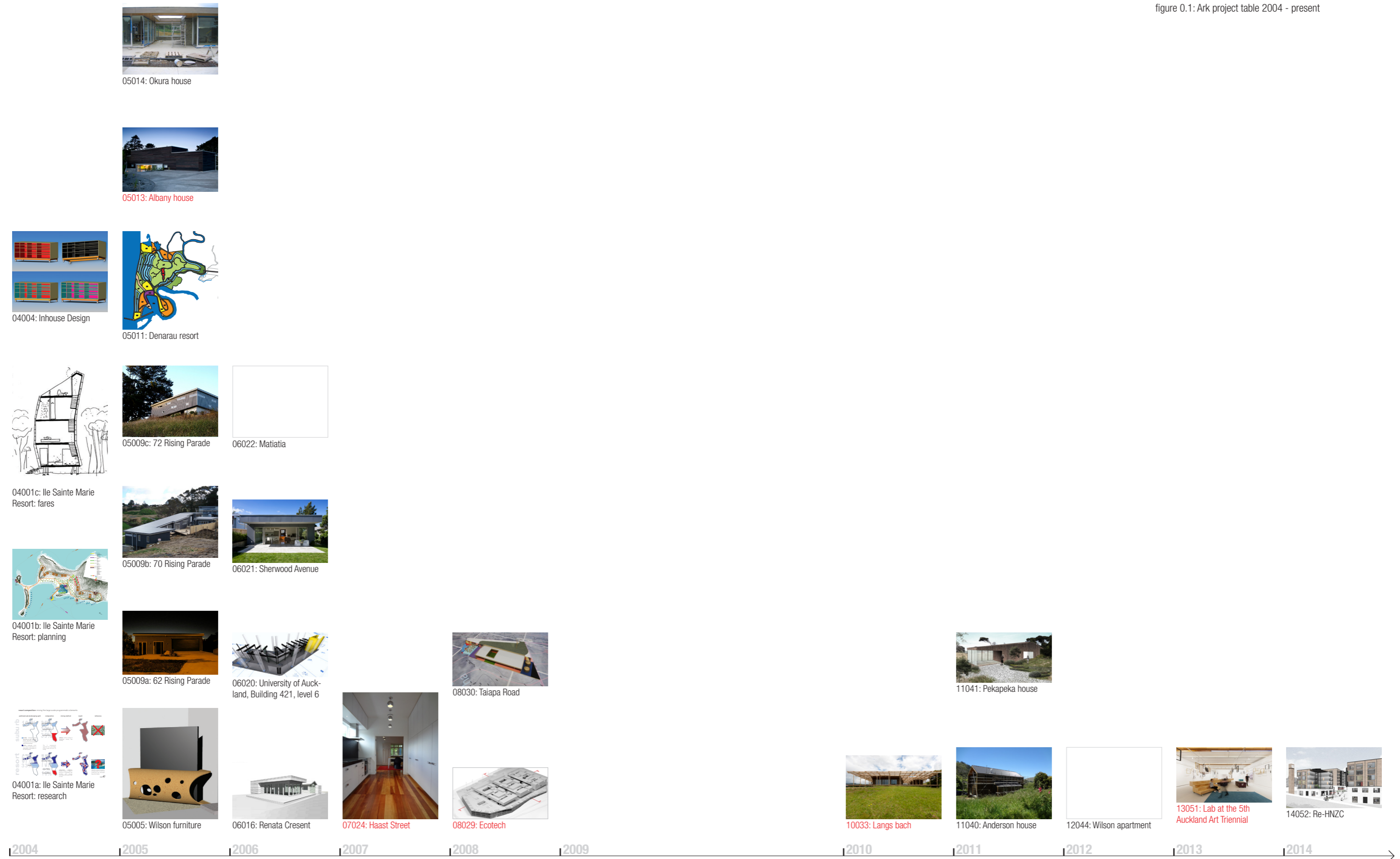
7 poise. Dictionary.com. <http://dictionary.reference.com/browse/poise?s=t> (accessed 05.04.14, 9.47am).

8 poise. Dictionary.com. <http://dictionary.reference.com/browse/poise?s=t> (accessed 05.04.14, 9.47am).

INTRODUCTION



figure 0.1: Ark project table 2004 - present



This is a PhD by practice. It reflects upon the design of projects carried out with Ark, my architectural practice (figure 0.1). Ark was established in Amsterdam in 2003 before being transported to New Zealand in 2004. It has enjoyed a number of project-based collaborations, but essentially remains the space of a sole practitioner. I began this PhD in 2008, two years after my full-time appointment at the University of Auckland, School of Architecture and Planning where I now lead the Architecture programme in parallel to running Ark.¹ The PhD has operated as a medium through which to address issues of re-engaging, re-establishing and re-conceiving of practice in New Zealand having encountered approaches to architectural practice elsewhere.

Between 2001 and 2003 I carried out a Masters of Architecture at the Architectural Association's Design Research Laboratory (AADRL). I departed with an implicit concern for architectural composition wrapped around a bundle of other concerns that included notions of emergence, design ecologies, parametric design and geometric/material systems, all issues that have since been defined to fall within the architectural field of 'parametricism'.² Relocating that bundle to New Zealand, into an architectural environment conditioned by the predominance of a local lineage of modernist tectonics, catalysed this doctoral project. It identifies and addresses a common quandary for architects: How can we bring different approaches to architectural making together to the effect of creating new architectural works?

Subject

The enquiry found focus on the topic of architectural composition both as the act of bringing things into relation through making (models, drawings and other items) and as an outcome of that act. In examining the making itself, particular consideration was given to the embedded criteria by which design decisions were made, how they played out in the design process, and their implications for the design outcome. It revealed the importance of an attention to the ethereal qualities of relation between things as a sort of unfolding guide through which the making progresses. Those same qualities were also shown to be reflected in the completed artefact. This focus on compositional relations formed a common ground upon which to consider how two contrasting architectural paradigms (in parametricism and modernist tectonics) might operate together within one practice.

To the parametricist, modernist tectonics might be seen to be concerned with configurations of materially contrasting, rectilinear parts fixed in relation to one another. The emphasis placed upon detail (as the physical meeting of parts) is evidence of the field's interest in those relations. But it presents very little discussion of the design processes that bring the parts and relations into being. On the other hand, through the lens of tectonics, parametricism may seem to be committed to the pursuit of a particular,

¹ While the PhD has been a means to facilitate a relation between academia and practice, the research does not address this relation. Similarly, while the agency of my academic role in the research is acknowledged, that agency is not addressed in any depth.

² Patrik Schumacher, "Style as research programme" in *DRL ten: a design research compendium*, ed. Tom Verebes (London: AA Publications, 2008), 11-13.

sinuous quality of form. But the work often remains diagrammatic and rarely results in the production of buildings. Indeed, realisation in built form doesn't seem to be a principal motivating factor in the field. Instead, focus is maintained upon on-going processes of formation. Oddly however, the compositional qualities that those processes are geared to deliver, those qualities that distinguish parametricism, are seldom discussed.

These alternate views on two opposing architectural cannons brought another level of specificity to the research question: Can these two emphases – the composition of tectonic parts and the on-going process of formation – be reconciled within the one approach to architectural design?

Method

The enquiry progressed by examining five of Ark's design projects through the lens of a sixth. The sixth was a compositional taxonomy that set out to identify compositional characteristics inherent in the projects through which a dialogue between the tectonic and parametric might be established.



figure 0.2: Albany house
photography: Simon Devitt

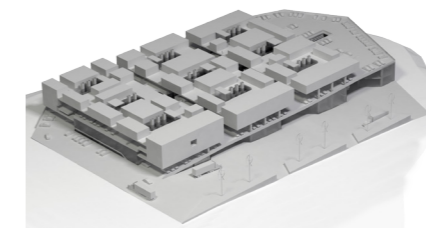


figure 0.3: Ecotech



figure 0.5: Haast Street
photography: author



figure 0.4: Langs bach
photography: Sajeev Ruthramoorthy



figure 0.6: Lab at the fifth Auckland Art Triennial
photography: Lucas Doolan

The five projects considered through the taxonomy were the Albany house (2009), Ecotech (2009), Langs bach (2012), Haast Street (2013), and the Lab at the fifth Auckland Art Triennial (2013) (figures 0.2-0.6). These were selected from a larger body of work because they were felt to best represent what Ark was trying to achieve even if that vision only became clear through the research. The Lab was a kit-of-parts that allowed a series of exhibits to play out in a gallery. Albany and Langs were projects for new, stand-alone houses, while Haast Street was a renovation to an old bungalow. Ecotech was a speculative project for a new manufacturing complex. To some degree there is a breadth of programme demonstrated in this selection, as well as an ambition to engage with work at a larger scale – indeed, of the five, the largest, Ecotech, is the one that has not been built.

Written and drawn forms of analysis were brought together through the compositional taxonomy to the effect of showing that the same six types of part were present in each of the projects – a property drawn from tectonics. It also showed the recurrence of three ‘qualities of relation’ between the parts – a concern inherent within principles of parametric formation. But as the taxonomy developed, so too did the issue of its formality. It seemed static, formulaic and descriptive to the point of excluding discussion of how it came about, how it developed, and the agency it had in relation to the work it was describing. However, as the research advanced it became clear that, rather than being fixed as was feared, it was provisional. It consisted of pieces of information in contingent alliances that allowed the whole to adapt to account for the specificities of each new project.

While Ark’s work is located in the field of modernist tectonics, its approach to design embraces a way of working and thinking that is associated with parametricism. The projects featured here show that this approach allows for the norms of tectonics to be questioned and past formations (those of the project, the practice and the broader field) to become ‘agents’ in an evolving body of work. The aim of the approach was not to bring forward any third hybrid between parametricism and the tectonic immediately. Rather, it aimed to articulate a space in which each compositional order may inform and evolve in relation to the other.

Contribution to knowledge

The contribution to knowledge that this research makes lies in the demonstration of an approach through which two different architectural paradigms might be brought into productive relation. The work here involves modernist tectonics and parametricism, but as a ‘method’ it is generalizable beyond these two particular fields. While the research shows these two being brought into relation, importantly, it does not reconcile them into one. Instead, the problem of how to create new works by combining opposing compositional orders is exposed as a workable challenge.

Format & constituents

The Appropriate Durable Record of this doctoral research consists of three parts. Working alongside this document is a video recording titled *Ark: pursuing qualities of relation through a provisional compositional taxonomy*. It records an exhibition of Ark’s work and its presentation to examiners as part of the examination process. The exhibition shows how each field is informing the other at this stage in the life of the practice. Central to the exhibition is a ‘vessel’ consisting of seven parts. It allows for the demonstration of how an attention to qualities of relation guides the compositional process in the creation of a series of new configurations and thus how this process leads to the making of new work.

This document consists of two volumes. *Ark: A Provisional Compositional Taxonomy* presents generalised diagrams about Ark’s compositional taxonomy followed by documentation of each project on the terms it establishes. In effect, this is a formal analysis of the five design outcomes through the lens of the compositional taxonomy at a particular moment in time. This volume, *Ark: Pursuing Qualities of Relation* is a discussion of design process that reflects on the five projects and the compositional taxonomy itself. The effect of this bipartite format is to reframe the issue of the formality of the formal analysis initially discerned in the taxonomy as a tension between process and outcome, the qualities of which are reflected (and reinforced by each other) in one another.

Reflecting on reflective practice: The manner of the method

This document is written largely as first person accounts in the past tense with the intention of maintaining a sense of my presence as an agent in the work as it is recounted. It also points to the mode of the research (by reflective practice) and the way that mode unfolded as a specific research approach or ‘methodology’ in relation to this body of research. With this PhD being concerned with relations between process and outcome, it is necessary to set the research outcome against an account of the methodology that led to it.

Over the course of the research different written reflections were articulated through different lenses. These included academic articles, the review of candidature (RoC) proforma, Post Graduate Research Symposium (PRS) presentation notes, review transcriptions and the compositional taxonomy itself. Each lens provided a particular way to see particular things happening in the research at a moment in time on its own terms. When certain parts – notes, sentences, paragraphs, chapters – were extracted from certain reflections and brought into relation with one another, a sense of something developing across the work became evident. It gradually became clear that this process of assembling and reassembling parts into relation was not only a way of describing the research methodology of this PhD, it was also descriptive of the compositional methodology I have come to articulate through it. Correspondingly this text reflects the way the research has been carried out, which reflects the way the Ark’s work is produced – the work and the text bear similar compositional tendencies. Some of the parts were written

together, their relations carefully articulated. Others were allowed to sit alongside one another, while others are set with gaps between them.

Because the research has occurred through a number of different lenses, no one account drawn through any one lens is able to provide a description or a sense of the methodology as it emerged. In an attempt to provide a fuller sense of it, and true to the nature of the research, two different accounts are juxtaposed below. The first account is drawn through the RoC documents. The second is a narrative assembled from PRS presentation notes.

The Review of Candidature document as a lens

Looking through the lens of the RoC document, changes in the title of the research give a sense of something steadily coming into being across successive, semester long intervals. This lens was particularly useful as things started to gel rapidly in the final stages of research. It offered assurance that issues being brought to the fore in the research weren't just being pulled into the work to meet an end but had been present in the work for considerable time. In turn, that brought confidence to the process and the end being approached.

October 2008: The Parametric and Critical Practice
May 2009: An Ecology of Design: Field, Matter, Procedural Logic
October 2009: Procedural Logics: Toward diversity, novelty and apparent fitness in architectural design processes
May 2010: The Craftiness of Design
October 2010: Adaptiveness in Design
May 2011: The Craftiness of Design
October 2011: The Complexity of Simplicity in Architectural Design
May 2012: Crafting the provisional in architectural design
October 2012: Systems, craft and curation in architectural design
June 2013: Pursuing a sense of relational emergence in the work of Ark
October 2013: Pursuing emergent relations in the work of Ark

The research summaries in the RoC documents had a similar effect. Through them a narrative of the research process unfolded that reinforced an idea of steady process that proceeded from a beginning, through well-formed phases of research, toward an end. It reads as follows:

This PhD began with questions about my own iterative modes of drawing and modelling and how they might be developed into a committed, software-based, parametric practice. That more technical ambition receded as questions of "How?" and "Why?" do I make iteratively were brought to the fore. This line of reflective questioning led to four successive phases of research. The first phase concerned different modes of drawing and modelling. In the main, this phase was carried out as a reflection on the Ecotech project and found an outlet in an article titled "Maintaining the abstract critical facility in post-digital drawing

practice."³ It drew together points made by Stan Allen⁴ and Greg Lynn⁵ in a discussion of the "...contingent relationships between tools, techniques and outcomes through which the design is pursued"⁶ in order to maintain explorative intentions in the design process.

The second phase traced the 'craft' involved in architectural making practices through an account of the design process of the Langs Bach project. It began by questioning the extent to which care in the act of making is relevant for architects, and whether or not the care and precision often taken in making drawings and models had any importance beyond those representational artefacts. It was situated initially against a concern with how the work of architecture (making with architectural media) was understood by non-architects more generally. This trajectory ran through Tim Ingold's *The perception of the environment*⁷ among others. It puzzled me that Ingold seemed to see the 'craft' in certain making practices and not in others.⁸ On the other hand, Richard Sennett in *The craftsman*⁹ seemed to see 'craft' in many human activities. 'Craft' as I came to see it, rather than being a thing, a process, or an approach to making, was a quality of approach to doing.¹⁰ Out of this evolved a notion of emergent craft. It was explored as a way of thinking about how care in the act of making might extend beyond the material and representational artefact to also account for the act of composing relations between elements, or aspects, of a project. The outcome was an article published in *Craft + Design Enquiry 5* titled "Pursuing a sense of the emergent through craft practices in architectural design."¹¹

³ Michael Davis, "Maintaining the abstract critical facility in post-digital drawing practice," *Interstices 11* (2010): 82-90.

⁴ Stan Allen, "Terminal Velocities: The Computer in the Design Studio," *Practice: architecture, technique + representation*. Expanded 2nd. Oxfordshire: Routledge. (2009): 70-93.

⁵ Greg Lynn "Forms of expression: the proto-functional potential of diagrams in architectural design," *Folds, bodies & blobs: collected essays*. La lettre vole (1998), 223-233.

⁶ Michael Davis, "Maintaining the abstract critical facility in post-digital drawing practice," *Interstices 11* (2010): 83.

⁷ Tim Ingold, *The perception of the environment : essays on livelihood, dwelling and skill*. London: Routledge, (2000).

⁸ I took issue with Ingold on a number of accounts. They might be best summed up in the following couple of passages: "For the skilled practitioner consults the world, rather than representations (rules, propositions, beliefs) inside his or her head, for guidance on what to do next." (Ingold 2000: 164). He doesn't seem to see that the making of the representation becomes the means through which to understand the world. The building craft he seemed to privilege in the way he discusses it doesn't differ from what I was calling at the time 'architectural craft'. In relation to the idea that modern architecture is supposed to be completely determined in architectural drawings and the like before construction begins, he writes (with a sort of Ruskinian tone) "To take this view, however is to deny the creativity of the very process of environmentally situated and perceptually engaged activities, that is of use, through which real forms emerge and are held in place. It is the activity itself – of regular, controlled movement – that generates the form, not the design that precedes it. Making, in short, arises within the process of use, rather than use disclosing what is, ideally if not materially, ready-made." (Ingold 2000: 354). While his point holds he makes it the expense of design. The work of design involves making with architectural media in ways that correspond precisely to the argument he makes throughout the text. Ingold's reading of architectural design here is that it is representational rather than a condition that emerges from the field of relations involving the body, material, environmental etc. The position I took in relation to this text led to the introduction of the notion of emergent craft and a reconsideration of the AADRIL Kinetetras project discussed in chapter 3.

⁹ Richard Sennett, *The craftsman* (New Haven, Conn.: Yale University Press, 2008).

¹⁰ This came about through a discussion with Peter Downton that played out over twelve months or so.

¹¹ Michael Davis, "Pursuing a sense of the emergent through craft practices in architectural design," *Craft + Design Enquiry 5* (2013): 49-71.

The third phase shifted the research focus from design process to design outcome. It took a cue from Foreign Office Architect's *Phylogenesis: FOA's Ark*¹². It looked across all five project outcomes and discussed certain observable consistencies between them. A diagrammatic taxonomy of the projects, carried out in parallel to text based analyses, revealed evidence of a compositional condition underlying my practice. The fourth phase wove the earlier attention to design process together with the taxonomy. The outcome of this fourth phase was this dissertation.

PRS presentation notes as a lens

The question of why I wanted to develop a committed, software-based, parametric practice was accompanied by the suggestion that my iterative drawing and modelling practices constituted a manual parametric design practice.¹³ Despite the impact this observation had on me, the idea of a manual parametric practice didn't feel substantial enough and was put aside. It took three years for the seed of the idea of a manual parametric practice to grow and feature in the first draft reflections on the Langs Bach project.¹⁴

The research carried on in a distracted manner for the first two years. It felt like I was poking a stick in the dark, not quite understanding what it was that I was trying to hit. Work was presented in veiled terms to make sure it didn't tell a story that I didn't want it to tell, but without any certainty of the story I did want it to tell. However, there are moments in all work on which things turn, and sometimes their importance is only understood in reflection. The May 2010 PRS was one of those moments and it will be returned to in the chapters that follow. The collection of models presented at that PRS lead to a protracted discussion of a notion of 'emergent craft' and a quality we called 'craftiness' that played out over the following two years. With it, emergence fell away from the AADR bundle. Focus fell on the design process as a process of 'crafting'. Looking back, that focus seems to have been a means to avoid discussing design outcomes that I wasn't yet confident about. Having engaged at what I felt to be the sharp end of international architectural discourse at the AADR, my work, in New Zealand, felt 'old fashioned'.

Within the discussion of design process there was a problem of how to take the reader inside. As phase two of the Langs Bach project began, an idea was picked up of writing about the work as it was being made – about what was being made and how, the feelings it brought forward, what was occurring around it as it was being made, and thoughts it evoked beyond the task at hand. This was recorded initially as notes in a sketchbook and then transferred to a digital format. At the time, its value wasn't realized. It was twelve months later, in writing the first draft reflections on the Langs Bach project that a use for the notation became apparent. It has since become an aspect that parts of the ADR hinge around in terms of its demonstration of a project being brought into being and the qualities of relation established therein.

12 Foreign Office Architects, *Phylogenesis: FOA's Ark* (Barcelona: Actar, 2003).
 13 Pers. Comm. Mark Burry to the author, October 2008.
 14 The idea of a manual parametric practice remains a topic for further expansion.

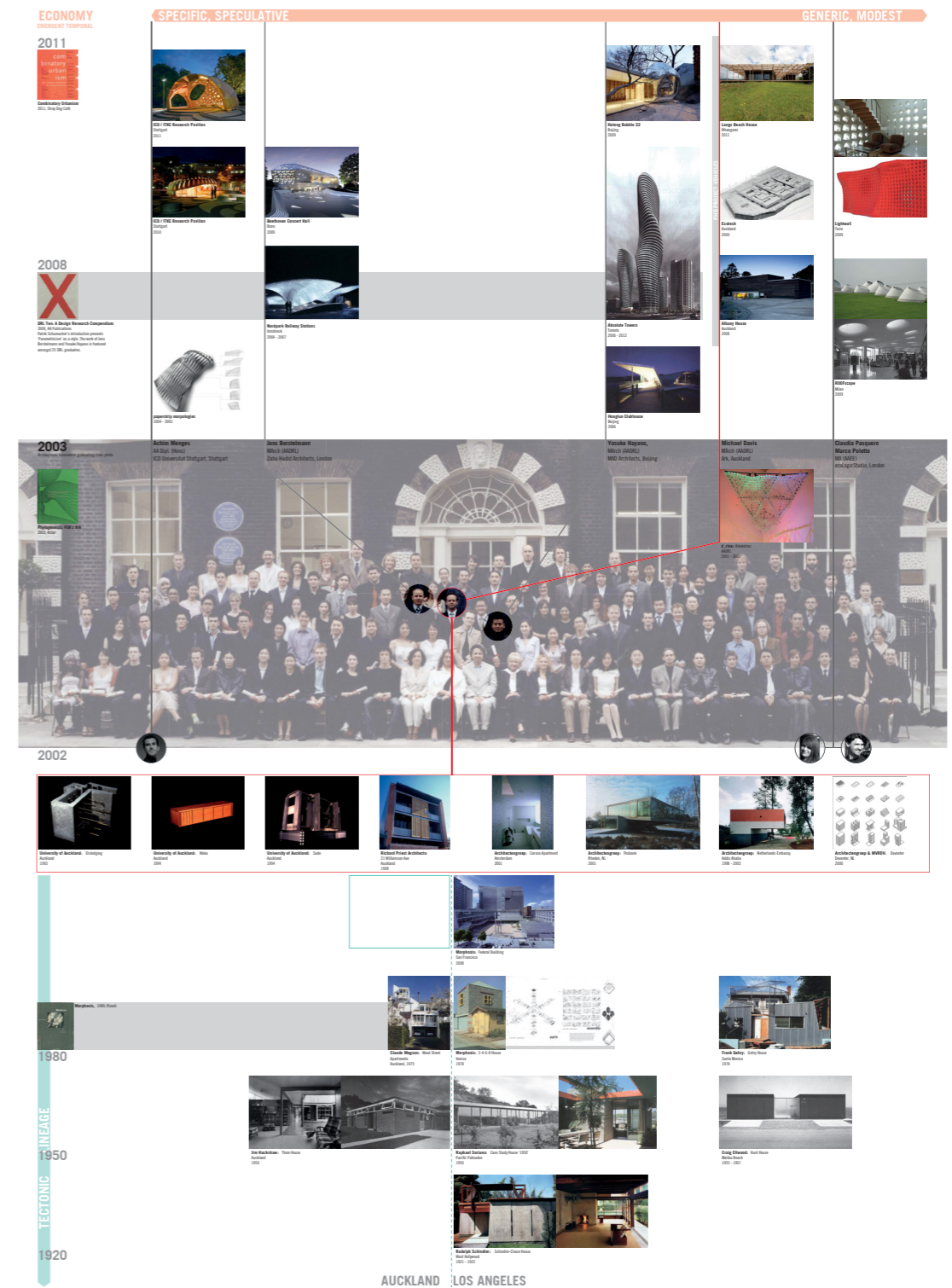


figure 0.7: field of practice diagram

“Pursuing a sense of the emergent through craft practices in architectural design” was published in *Craft + Design Enquiry 5* in 2013.¹⁵ Writing the paper propelled the research to such an extent that by the time the paper was published the ‘cracks’ in it were indicative of the research having outgrown the idea of craft. But it brought to the surface a dual discussion of qualities of process that repeated in the work, and of qualities of process becoming present in the design outcomes. With it came an awareness of something also repeating in the design outcomes – compositional tendencies. As the article was being written, just prior to the June 2012 PRS, I attended the condensed research methodologies course at RMIT. Having been immersed in a mess of PhD parts for four years, Professor Leon van Schaik’s presentation of how one might view and pursue a PhD by reflective practice made clearer an approach by which the parts of the research might be assembled. A few days after the course, PhD candidate Belinda Winkler’s PRS presentation was the first time I had seen a diagram of a community of practice and understood its relationship to the research. A week later, in conversation with Brent Allpress (my advisor and a senior lecturer at RMIT) the idea of a ‘situated reflection’ was discussed and the importance of making my own field of practice diagram became clear.

I had willed my practice to find some sort of space in the field of parametricism. Slowly, when confronted with the evidence that the work was best described as belonging to the field of modernist tectonics, I relented (somewhat). In diagramming my field of practice for the October 2012 PRS I set the work of my AADRL colleagues in relation to my own (figure 0.7). I then tracked my route back through the Netherlands, back to Auckland, and back to my undergraduate work at the University of Auckland where I had been taught by lecturer and architect Claude Megson (1936-1994) and by architect and studio instructor Jim Hackshaw (1926-1999) among others. Focus began shifting away from my contemporaries at the AADRL and onto a lineage of modernist tectonics in New Zealand. The diagram also included representatives of the Californian derivative of modernist tectonics (in architects Raphael Soriano and Craig Ellwood) and their successors (in Frank Gehry and Morphosis). It also included the covers of books that I realised (through making the diagram) had been pivotal to me: *Morphosis Buildings and Projects*;¹⁶ Foreign Office Architect’s *Phylogensis: FOA’s Ark*;¹⁷ *DRL Ten: A Design Research Compendium*;¹⁸ and *Combinatory Urbanism*.¹⁹ It wasn’t so much a diagram of a field as it was an encapsulated ecology of agents, experiences and effects that Ark was operating within. Seeing my work in relation that of my teachers, who taught me in the role that I now occupy, and seeing them in relation to their Californian contemporaries, brought an awareness of the larger thing to which Ark is contributing. I wanted to write about the design outcomes – all of a sudden they were exciting to me. Ark’s work was located in the field of modernist tectonics

15 Michael Davis, “Pursuing a sense of the emergent through craft practices in architectural design,” *Craft + Design Enquiry 5* (2013): 49-71.

16 Morphosis Architects, *Morphosis: Buildings and Projects* (New York: Rizzoli, 1989).

17 Foreign Office Architects, *Phylogensis: FOA’s Ark* (Barcelona: Actar, 2003).

18 Tom Verebes, ed., *DRL Ten: A Design Research Compendium*, (London: AA Publications, 2008).

19 Thom Mayne, *Combinatory urbanism: the complex behavior of collective form* (Culver City CA.: Stray Dog Café, 2011).

but the way it was approached had been significantly inflected by exposure to the field of parametricism at the AADRL.

A preoccupation with geometric/material systems (another part of the AADRL bundle) conditioned the approach taken to writing about the outcomes, but how to start that discussion presented a hurdle. The projects had been held so close for so long that any sort of critical distance between me and them had collapsed. Then, an invitation arrived. I was asked to write a critical review of three projects by Auckland based practice Crosson, Clark, Carnachan Architects (CCCA) as part of an introduction to their latest monograph. Their work has affinities with that of Ark and a decision was made to write about their work in terms of geometric/material systems. But as the writing progressed, the focus shifted from the systems themselves onto relations between the systems and experiential effects of the systems in relation. In effect, the CCCA text operated as a sort of surrogate that developed a rough idea into a way to approach a written analysis of Ark’s work because as I wrote about CCCA’s work at some level I became aware that I was reflecting on my own. Through the lens of the CCCA text, the awareness of compositional tendencies first picked up through reflecting on the Langs Bach project was magnified. Immediately after completing the CCCA text I began re-reflecting on the Langs Bach project in the same way but the struggle to work the idea of geometric/material systems into this new reflection only resulted in a sense of inaccuracy and confusion. For a long time the discussion was of a ‘compositional system of systems’. Pia Ednie-Brown slipped the word ‘formula’ into a conversation concerning the taxonomy.²⁰ Describing it as a compositional formula was a more accurate way to describe the taxonomy as it stood at the time. Doing so triggered the release of the idea of geometric/ material systems as an issue and it fell away into the background.

The model means to illustrate the tendencies inside Ark’s work was found in FOA’s project taxonomy, inside the green cover of *Phylogensis: FOA’s Ark*.²¹ It had been peering at me from the field of practice diagram as the CCCA text was being written. FOA’s taxonomy classified their projects in terms how they might be understood to have evolved conceptually from a common, single surface. They described each outcome as a distinct formal species, but their evolution was not discussed in terms of composition, nor in terms of discrete parts. Ark’s taxonomy on the other hand came to demonstrate an explicit concern for compositions consisting of parts-in-relation. As it progresses, this dissertation will examine this idea in detail.

A particular story of the research unfolded through the RoC documents. They had value, in that they brought the research to a point twice a year where it could be clearly seen what was being achieved. But that clarity came at a price as the RoC documents excluded a sense of what was being experienced in the work. The RoC’s sanitized the story of what was a very messy research process. Notes made for the PRS presentations

20 Via Skype Pia Ednie-Brown and I discussed the first draft reflection on the Langs Bach project (written after the CCCA text). The conversation made it clear that the research had become stuck on the idea of ‘systems’.

21 Foreign Office Architects, *Phylogensis: FOA’s Ark* (Barcelona: Actar, 2003).

(edited and assembled into the narrative above) begin to give some idea of the mess. They demonstrate things coinciding in time, falling into place together to define an evolving methodology that constantly experienced shifts in constituency and direction. What it doesn't provide is an idea that all of this change was felt to be occurring around something that lay at the core, something that took focused work to articulate. These two very different stories of the same thing are told through two different lenses. They are accurate on their own terms, but it is only in bringing them into relation here, by holding them in a sort of tension, that they give a fuller account of the methodology that evolved and a fuller sense of the experience of the research as it was being brought into being. They also begin to point at the nature of reflective practice more generally: it is compositional.

The compositional taxonomy as a lens (the sixth project)

The compositional taxonomy began as a lens through which to identify compositional tendencies in the work. What it became was a means to understand those tendencies as interconnected aspects of a larger condition inhabiting Ark's work – a compositional condition. Drafts of the re-reflection on Langs came first, then similar reflections on the Albany and Ecotech projects. Through the writing a feeling emerged that the same types of 'part'²² inhabited each project. The exploded isometric line drawings were a way to articulate them. Bringing the drawings of each project alongside one another made it clear: even though they took on different specific forms and roles in each project, there were six types of part occupying the work. Across the course of the research they came to be known as the diagrammatic volume, constructed space, articulated plane, mannered skin, operative backdrop, and the variable. Together the writing and the drawings showed the recurrence of three qualities of relation between the parts. They were eventually named 'tension', 'provisionality' and 'poise'. These qualities were related in that tension laid down the conditions for provisionality, and together tension and provisionality laid down the conditions for moments of poise.

Ark: Pursuing Qualities of Relation: chapter outlines

This story of the projects, of Ark as a practice and the research, is told through the lens of the compositional taxonomy on these terms. It draws together parts of other stories seen through other lenses into a whole that is laid out in six chapters. Bracketed between this introduction and a conclusion is a discussion of how the research is situated, followed by three chapters that tell separately the entwined stories of tension, provisionality and poise as they appeared in the research.

Chapter 1, "EMERGENT ARCHITECTURE – AADRL and its on-going implications in the work of Ark" begins with a summary of a journey from the University of Auckland, to the AADRL and back again. It is punctuated by an account of an event which subsequently allowed for the characterisation of two fields of architectural practice and the location of the research in relation to them.

²² The term "part" is explored as the dissertation progresses.

Chapter 2, "TENSION: An emergent quality of the design project ecology" conceptualizes the design project as an ecology consisting of a diverse range of agents, relations and interactions. It progresses through setting reflective accounts of experiences at the AADRL against a reflective account of the Langs Bach project. The accounts unfold discussions of composition, tension as a quality of composition, and knowing-through-making. Collectively they provide an idea of how the notion of a design project ecology plays out in Ark's work. Underlining that idea is a discussion of the larger tension at play in the practice. While initially perceived to lie between two fields of architectural practice, that larger tension is shown to in fact lie in the desire to create dynamic compositions from static parts.

Chapter 3, "PROVISIONALITY: The provisional compositional taxonomy" introduces the idea of provisionality and outlines how it was initially seen in the work. This chapter primarily considers the Haast Street and Lab projects. It expands on the taxonomy by showing that it isn't as static as it first appeared, that it is provisional, and with that the taxonomy is taken as a vehicle through which to demonstrate the idea. Compositional tendencies seen in the work through the taxonomy are laid out before accounts demonstrate how these tendencies move within the work and how the taxonomy develops to account for these moves.

Chapter 4, "POISE: Pursuing the emergent" discusses the idea of poise in the work and how it has developed through the taxonomy. It elaborates on why tension, provisionality and poise are qualities that are sought in the work before moving on to discuss how these qualities have brought about a reconsideration of the field the work operates within.

The CONCLUSION first presents an outline of the enquiry. It is followed by a summary of the contribution to knowledge prior to a brief discussion of the areas of on-going enquiry the research has opened up. The conclusion closes with a short discussion of the 'stories' that the research has emerged through, a discussion which caps the brief reflection on reflective practice presented above.

EMERGENT ARCHITECTURE

The AADRL and its ongoing implications in the work of Ark

Chapter 1



In retrospect, this document marks an end of sorts to what might seem a strange journey. That journey is outlined below. Its strangeness is punctuated by an account of an event which subsequently allows for the characterisation of the two fields of architectural practice to which the research is related: Kenneth Frampton's discussion of tectonics is set in relation to Patrik Schumacher's discussion of parametricism and the two are compared in terms of notions of emergence, composition and making. The aim of doing so is to distinguish my approach to practice from the authorising models that Frampton and Schumacher present of their respective fields while also selectively drawing lessons from each. This, in turn, allows Ark and the research to be located in relation to both.

A loop

University of Auckland, Auckland (1990-1994): After two mediocre years working in the design studio as a student at the University of Auckland's School of Architecture, I abandoned the studio in favour of working in the School workshops: I decided that if I was going to do poorly at University I was going to have fun doing so – I was going to make stuff. The speed, precision and the risk of the bench-saw, the thicknesser, the planer and so many other tools in the wood workshop were compelling. I became an expert modeller with kauri and cast concrete (figures 1.1 & 1.2). In parallel I developed a drawing practice that involved drawing in charcoal on the back of rolls of surplus wallpaper (figure 1.3). The contrast between the two modes in terms of speed and precision has remained a curiosity. The concern for materiality in both practices has seemed to be the only consistency between the two until recently.

Richard Priest Architects, Auckland (1995-1998): The first cardboard model I made was on my first day of full time work. My first drawing in ink on film with a drawing machine was a day or so later. It was an analogue practice; even hatching was done by hand (figure 1.4). For the most part we designed high-end houses and small scale apartment complexes. After three years I registered as an architect and left.

Architectengroep (now SeArch), Amsterdam (1999-2001): Throughout the 1990's Madrid based *El Croquis* magazine seemed to have a focus on contemporary Dutch Architecture.¹ The work of OMA, MVRDV, Neutelings Riedijk, VanBerkel & Bos, and Wiel Arets drew me to The Netherlands. Whatever they were doing it was different, and I wanted to do it too. I had the good fortune to work for Bjarne Mastenbroek and Dick VanGameran at de Architectengroep in Amsterdam with a small number of graduates from the Architectural Association and the Berlage Institute. I became the foam-cutter expert. Combinations of AutoCad, Illustrator, Photoshop, with a printer, double-sided tape, a knife, ruler and card, facilitated the development of a sort of collage practice that also involved formal experimentation in foam (figure 1.5).

¹ See for instance *El Croquis* numbers 53, 72i, 79, 85, 86, 94.



figure 1.1: waka huia interior (1994), kauri and jarrah
photography: Mark Klever



figure 1.2: detail of Sade model (1994), concrete, steel, brass, polycarbonate
photography: Sajeev Ruthramoorthy

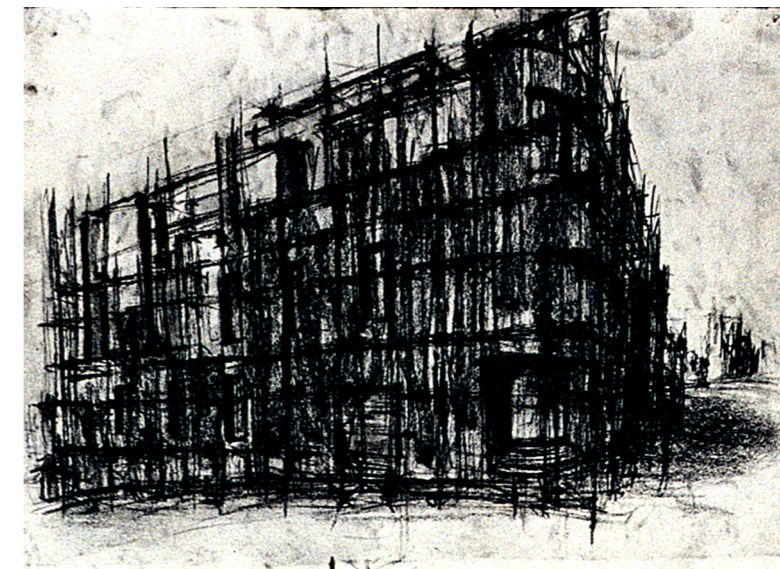


figure 1.3: place of the antipodean crowd (1993), charcoal on wallpaper

The Architectural Association's Design Research Laboratory, London (2001-2003): The purpose of attending the DRL was to develop a speculative, digital arm to my practice. Formal experiments with foam were one thing, formal experiments with 3DSMax promised to be many more. But the expertise with physical materials and analogue ways of making that I took to the team environment at the DRL meant that my role became more the physical realisation of the team's digital, formal speculations through CNC fabrication, 3D printing, welding and vacuum-forming (figure 1.6).

Ark, Auckland (2004-present): Ark (my architectural practice) was established in Amsterdam in 2003. I returned to Auckland (with Ark) in late 2004, and went into a shifting combination of academic and professional practice when I was appointed to a fulltime position at the University of Auckland's School of Architecture and Planning in 2006. My focus was, and in certain respects remains, how 'digital' and 'analogue' media (if such a distinction is still useful) might be brought into productive, critical relation in design.

This outline is, of course, a simplified and abridged chronology of a complex story which involves multiple trajectories and intensities. The means of this simplification is a focus on the development of my making practices as an architect over my career to date. The relevance of this is two-fold: Exposure to a variety of modes of practice (and related making practices) was my main motivation for practicing outside of New Zealand – it set me on my way; and this PhD began with questioning the iterative nature of those practices as they had developed. What seemed to me to be a logical progression based on following my interests in making with architectural media left me ideologically stretched at the outset between two apparently incommensurate fields of architectural practice: modernist tectonics and parametricism.

An event: 'Blob versus Box'

The 2008 NZIA Annual Conference was given the title of *Stand and Deliver: Concept and Detail*. The task of organising the conference had consciously been shifted to a younger generation of architect (my generation) than had previously been responsible for it. Central to the organisation were two of my former colleagues – one from my time as an undergraduate at the University of Auckland, another from my time as a Masters candidate at the Architectural Association.² From our differing experiences of architectural practice in other parts of the world, we had each absorbed a sense of the potential of evolving media and fabrication technologies to shift approaches to practice. It seemed that some of that potential was finding fertile ground both in the schools of architecture and larger practices in New Zealand. As a result, the promise the conference carried as we built toward it was that of a brave new world. My colleagues invited keynote speakers that reflected that sense. Chris Bosse (then recently departed from PTW, Sydney) rode in on the wave of success he was enjoying as the principal designer of the Beijing WaterCube (constructed 2004-2007). He was accompanied by Brett Steele of the

² Marianne Riley and Deborah Laub were both working at JASMAX at the time.

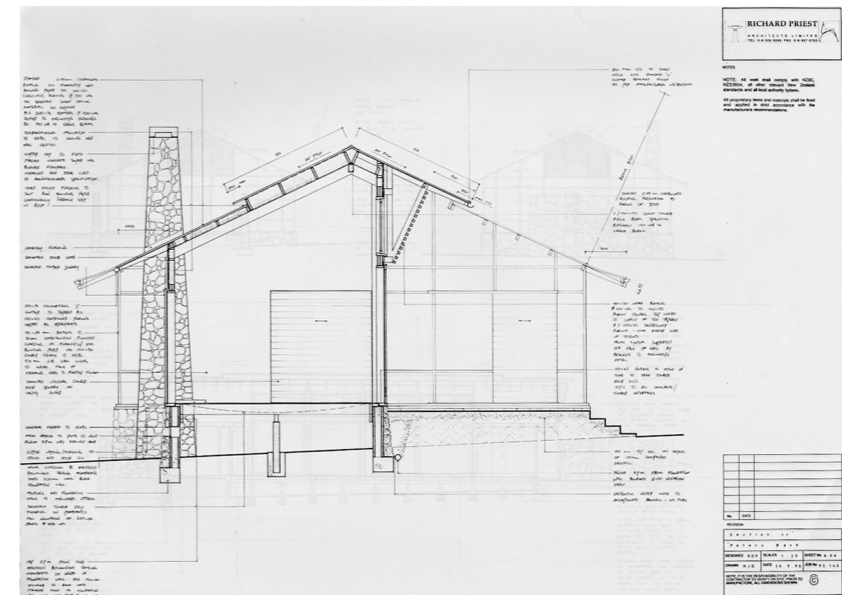


figure 1.4: Richard Priest Architects, Peters bach (1995), ink on drafting film



figure 1.5: de Architectengroep, IJburg Blok 17 (2000), untlack on polystyrene foam
photography: Javier Calvo

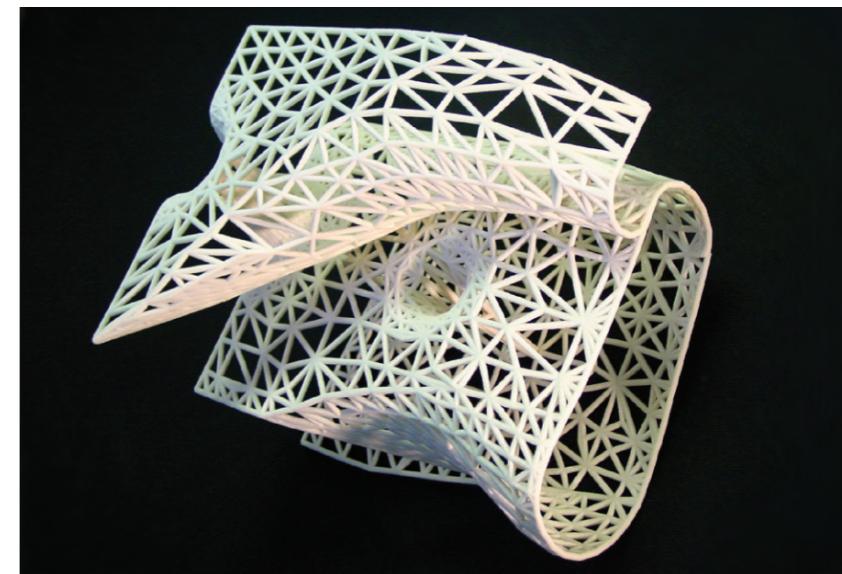


figure 1.6: d_rive (M.Davis, S.Hatzellis, A.Stern) structural section of *Barbican project* (2002), ZCorp 3d print
photography: Steven Hatzellis

Architectural Association (London) and Greg Pasquarelli of SHoP (New York). I was included on the second tier of speakers as 'one to watch' having been immersed in the discourse of the Architectural Association and having been recently appointed as the University of Auckland's new 'digital-design' guy.

In parallel, the three Auckland schools (Unitec, AUT and the University of Auckland) set up an exhibition of digitally fabricated research outcomes, a first for New Zealand's architectural community. To my mind the effort was geared toward progressing the discussion of how these types of technologies might start to impact locally, particularly on our timber based construction industry. While the conference was held at Auckland's premier venue in the SkyCity Convention Centre, ominously, the exhibition was set 200 metres away in a run-down, musty, ground-floor rental space opposite the Farmers car park and behind St Patricks Church. Despite being well promoted to conference attendees it received very little attention.

Set against this background, certain experiences are lodged in my mind. I was asked to speak in a plenary session before Brett Steele, my former tutor. I spoke about new media and fabrication technologies and what they might mean for architecture in New Zealand. Focus fell on the parametric modelling work I was carrying out with my students. I demonstrated that students armed with this knowledge had greater potential than base level CAD jockeys; that they had the capacity, if utilised in the right way, to positively shift the way architecture was practiced in New Zealand. I was struck by an overwhelming sense of the audience being perplexed not just by what I was showing them, but how it could possibly be relevant to them.

The next morning Richard Naish of RTA Studio and I formed the panel to discuss Chris Bosse's work with him on stage. It was a plenary session chaired by former NZIA President Gordon Moller. Gordon was animated. He led from the floor adorned with headset microphone. The discussion ran from the Beijing WaterCube to a new project for a tower in the desert. The tower was beautifully rendered, with a smooth system of sinews reaching from the top of the tower down to the ground and out into the landscape – the smooth transition from vertical to horizontal facilitated by a contiguous scale-like cladding system ... Gordon Moller barked his disapproval from the floor.³ I remember my mouth falling open. This wasn't the manner of a receptive host. Chris wanted to engage in the conversation but it was clear that he had lost Gordon and through Gordon's criticism, much of his audience. I attempted to retrieve the discussion on terms that were perhaps more familiar and pressing for the audience: How had technology shifted his practice operations? How had his specification and contractual processes been impacted? But the opportunity had been lost.

³ Chris Bosse, "Solo Virtual Office," *Stand and Deliver: Concept and Detail*, 9-10am, 23 May 2008.

The experience was capped by a more useful conversation (in hindsight) that I had afterward with two of my more senior colleagues from the University of Auckland. With furrowed brows they discussed what they determined was a lack of composition in the work of SHoP. To them composition was an architectural imperative that SHoP were deferring through focusing on commercial imperatives and discussions of the software they were using.

My overall memory of the event is that it was like bad dinner party. We had invited two different groups of people who felt they had no common ground on which to have a conversation. We were naïve, perhaps, in the thought that the effect of bringing Chris Bosse, Brett Steele and Greg Pasquarelli into the midst of our local arm of the profession would catalyse a space for a wider discussion of the future of the profession locally in relation to rapidly evolving technologies. Initially, I argued this mismatch as an issue of age, that two generations were failing to communicate. But amongst those perplexed in the audience were some of my contemporaries, and many who were younger. In retrospect it was far more likely to be a function of our bringing together of two very different fields of practice: the parametricism of Chris Bosse, Greg Pasquarelli, and Brett Steele's Architectural Association didn't sit well in the midst of the New Zealand modernist tectonic tradition of Gordon Moller and the vast majority of my professional colleagues. They didn't speak the same architectural language. These two communities of practice held themselves to be separate and distinct from one another through their respective discourses to the point of being apparently incommensurate. To bring them into direct relation the way we did with the conference might be seen to be just plain weird. But was it really? Were they really that different? Was the common ground that we saw between the two fields really that hard to perceive?

In the months leading into the conference, stories of the successes of my contemporaries from the AADRL had filtered through to me through snippets of conversation, emails and the like. Brett Steele brought with him a copy of the then recently released book *DRL Ten: A Design Research Compendium*.⁴ It celebrated the work produced in the Architectural Association's Design Research Laboratory (AADRL) from 1997 to 2007. My own work featured inside, work from the second cycle of the 'Responsive Environments' research agenda (2001 to 2003). The coincidence of receiving the book and the experience of the conference brought an underlying personal issue to a head in the form of a question: "What was I doing back in New Zealand?"

⁴ Tom Verebes, ed., *DRL Ten: A Design Research Compendium* (London: AA Publications, 2008).

Parametricism

Inside *DRL Ten: A Design Research Compendium*, in a short essay titled “Style as Research Programme”, Patrik Schumacher, director at Zaha Hadid Architects and co-director of the AADR, presented the term “parametricism” as the descriptor of a new architectural style.⁵ This essay lay some of the ground for his subsequent treatise *The Autopoiesis of Architecture*.⁶

In “Style as Research Programme” Schumacher characterised parametricism through a rule base of heuristics:

“Negative heuristics: avoid familiar typologies, avoid platonic/hermetic objects, avoid clear-cut zones/territories, avoid repetition, avoid straight lines, avoid right angles, avoid corners ...

Positive: Hybridise, morph, deterritorialise, deform, iterate, use splines, nurbs, generative components, script rather than model ...”⁷

Parametricism might also be characterised formally as having a tendency toward fluid or sinuous configurations that are often the result of enfolding space (and programme) in a single, contiguous, ‘non-standard’ surface. That surface becomes the defining aspect of the architecture. With its conflation of cladding, structure, services, fenestration and other systems the resulting form might be seen to elide differences between systems in a way that represses the possibility of it being understood tectonically. While parametricism has been postulated in various venues as offering certain efficiencies in terms of material, energy and the like⁸ these kinds of arguments rarely result in built outcomes beyond economies that can sustain the kind of high-end patronage that is able to afford the technical innovation it depends upon.

Schumacher nominates centres of development and dissemination of parametricism to include Schools of Architecture such as the Architectural Association (London), Columbia (New York), UCLA (Los Angeles), Vienna School of Applied Art and practices connected to them.⁹

The word ‘style’ might be used to denote a recognisable aesthetic condition or manner of composition – a set of observable characteristics that recur to the point of becoming ‘normative’ within, and definitive of a field. For instance, to take a word from the quote above, ‘hybridise’ denotes a particular mode of composition where different things are

5 Patrik Schumacher, “Style as research programme” in *DRL ten: a design research compendium*, ed. Tom Verebes (London: AA Publications, 2008), 11-13.

6 Two Volumes:

Patrik Schumacher, *The Autopoiesis of Architecture, Volume 1: A New Framework for Architecture* (Chichester: J. Wiley, 2010).

Patrik Schumacher, *The Autopoiesis of Architecture, Volume II: A New Agenda for Architecture* (Chichester: J. Wiley, 2012).

7 Patrik Schumacher, “Style as research programme” in *DRL ten: a design research compendium*, ed. Tom Verebes (London: AA Publications, 2008), 12.

8 See for example Michael Hensel, Achim Menges, *Morpho-ecologies* (London: AA Publications, 2006).

9 Patrik Schumacher, “Style as research programme” in *DRL ten: a design research compendium*, ed. Tom Verebes (London: AA Publications, 2008), 11.

brought together and seamlessly blended. But despite his use of the words ‘style’, ‘hybridise’ and the like, Schumacher resists using the word ‘composition’. In *The Autopoiesis of Architecture: A New Agenda for Architecture* he goes so far as to state that within parametricism, traditional concepts of composition are encompassed within concepts of “organisation” and “articulation”.¹⁰ While the idea remains a fundamental tenant of architecture that operates under different names and with different degrees of articulation in different fields, the term ‘composition’ might seem to belong to an older, out-dated paradigm.

Emergence

The implication of positioning “Style as Research Programme” at the front of *DRL Ten: A Design Research Compendium* was that the collection of design projects following Schumacher’s essay (including my own) was illustrative of the style. The ‘Responsive Environments’ research agenda at the AADR fell within the ten year bracket *DRL Ten* attends to. It was underpinned by theories of emergence and related texts such as Kevin Kelly’s *Out of Control*¹¹ and Steven Johnson’s *Emergence*.¹² While the idea of emergence is important to the research presented in this document, my aim here is not to explore the idea itself in any depth but rather to recognise its importance to the field broadly described here as parametricism.

The concept of emergence is a model of considerable breadth and generality, most broadly and simply pertaining to how forms of organisation arise, or emerge as the result of an aggregation of multiple, small actions, often related by simple rules rather than as the result of a single action, or central controlling force. The idea of an ‘ecology’ is a useful way the think through processes of emergence because both involve multiple agents that are interrelated in a complex whole. This is discussed at the beginning of the following chapter.

Steven Johnson writes about “... agents residing on one scale producing behavior that lies one scale above them: ants create colonies; and urbanites create neighbourhoods.”¹³ That movement, from low-level rules to higher sophistication, is what he calls emergence.

10 Patrik Schumacher, *The Autopoiesis of Architecture, Volume II: A New Agenda for Architecture* (Chichester: J. Wiley, 2012), 50.

11 Kevin Kelly, *Out of control: the new biology of machines, social systems and the economic world* (Reading Mass.: Addison-Wesley, 1994).

12 Steven Johnson, *Emergence: the connected lives of ants, brains, cities and software* (London: Penguin, 2002).

13 Steven Johnson, *Emergence: the connected lives of ants, brains, cities and software* (London: Penguin, 2002), 18.

Pia Ednie-Brown examines the idea of emergence in relation to aesthetics in a manner that has particular relevance to architecture. In an article titled "Vicious architectural circles: aesthetics, affect and the disposition of emergence,"¹⁴ she calls attention to the problem of this common definition of emergence by pointing out that "the movement goes the other way as well" when "macro-emergent phenomena fold back to affect the micro ..."¹⁵ In the introduction to the same article she writes:

"Emergence is a model of creation, in the sense that theories of emergence are intrinsically concerned with how things are generated or created, and in particular with the relationship between emergent phenomena and the conditions from which they emerged. Such a theoretical model would seem to have a clear and obvious relevance for any kind of creative practice, but the discourse on emergence, which is predominantly framed through scientific models, hardly ever moves towards the connections between emergence, creative practice and aesthetics. Strangely, this is largely true whenever architects have turned to address the relevance of emergence for architectural practice, tending to discuss it in terms of computation, mathematics, engineering and biomimicry. This seems even stranger when we consider the fact that the architectural work associated with discussions on emergence is concerned with complex, sophisticated formal production that has an obvious aesthetic power. In part, this curious situation arises because aesthetics is often treated with suspicion."¹⁶

In her PhD dissertation "The Aesthetics of Emergence: Processual architecture and an ethico-aesthetics of composition"¹⁷ Ednie-Brown offers a more expansive discussion on this observation. She demonstrates that the roots of the idea of emergence lie in philosophy; that within philosophy the concept is essentially concerned with aesthetics; but that it has been interpreted through the sciences before being drawn into architecture. The problem thus articulated is that the sciences – which aren't concerned with aesthetics, composition or qualities of relation – filter these aspects from their discourse on emergence before its appropriation into design – which is fundamentally concerned with those aspects that the sciences filter out. Those working with ideas of emergence in architecture (including those who might be identified as 'parametricists') tend to discuss their work in terms of process and defer discussions of the aesthetic outcomes Ednie-Brown argues they are implicitly concerned with.

She identifies a group (active from the 1990's to the mid-2000s) operating in the field that includes the likes of Stan Allen, Greg Lynn, Bernard Cache, Lars Spuybroek and Alisa Andrasek and also figures connected to the Architectural Association – Michael Hensel, Michael Weinstock and Achim Menges. Her work relates this group to an

14 Pia Ednie-Brown, "Vicious architectural circles: aesthetics, affect and the disposition of emergence," *Architectural Theory Review*, Vol.17(1), (2012): 76-92.

15 Pia Ednie-Brown, "Vicious architectural circles: aesthetics, affect and the disposition of emergence," *Architectural Theory Review*, Vol.17(1), (2012): 83.

16 Pia Ednie-Brown, "Vicious architectural circles: aesthetics, affect and the disposition of emergence," *Architectural Theory Review*, Vol.17(1), (2012): 77.

17 Pia Ednie-Brown, "The Aesthetics of Emergence: Processual architecture and an ethico-aesthetics of composition." PhD diss. RMIT University, Melbourne, 2007. See chapter 4 in particular.

historical lineage that extends back through the work of the likes of John Frazer and Peter Cook in the 1960's, to the work of those such as Trystan Edwards and John Theodore Haneman in the 1920's.

At the Architectural Association between 2001 and 2003, questions as to the formal implications of emergence in architecture were being pursued through the 'Responsive Environments' research agenda in the AADRL studio (then directed by Brett Steele and Patrik Schumacher with Tom Verebes and Chris Hight) in the Emerging Technologies programme (EmTech – then directed by Michael Hensel and Michael Weinstock) and in certain Diploma Units including Unit 4 (then directed by Michael Hensel and Ludo Grooteman) from which Achim Menges was to graduate in 2002 before joining Hensel and replacing Weinstock as director of the EmTech programme. Through a series of subsequent publications – including the issue of *Architectural Design* titled *Emergence: morphogenetic design strategies*¹⁸ and *Morpho-ecologies*¹⁹ – Hensel, Weinstock and Menges went on to present a formal language of emergence in architectural design that was characterised as being where a single geometric element was extensively repeated and varied in relation to the previous repetition. Aggregates of these repeated elements – simple geometric cells in simple, part-to-part relationships – were extrapolated into a geometric/material system that was often described as presenting an emergent, formal complexity. Achim Menges et al's physical and parametric 'paper strip' models featured in *Morpho-ecologies*²⁰ offer a good example of such a system demonstrating the kind of formal complexity we were pursuing at the time (figure 1.7).

These types of geometric/material system ultimately give rise to the types of formal condition that characterise parametricism. While they are subsumed in Schumacher's *The Autopoiesis of Architecture*, they are a focal point for Achim Menges. Conducted principally in an academic environment, his practice combines the parametric modelling and digital fabrication of geometric/material systems with assembly and know-how in the construction of 1:1 scale projects.²¹ Menges, with his concern for these systems and the hands-on aspects of fabrication, stands as a counterpoint within the field to Schumacher with his privileging of the overall formal outcome.

18 Michael Weinstock, Achim Menges, Achim, Michael Hensel, *Emergence: morphogenetic design strategies* (Chichester: Wiley-Academy, 2004).

19 Michael Hensel, Achim Menges, *Morpho-ecologies* (London: AA Publications, 2006).

20 Michael Hensel, Achim Menges, *Morpho-ecologies* (London: AA Publications, 2006), 43-52.

21 Achim Menges, *Material computation: higher integration in morphogenetic design* (Chichester: Wiley, 2012).

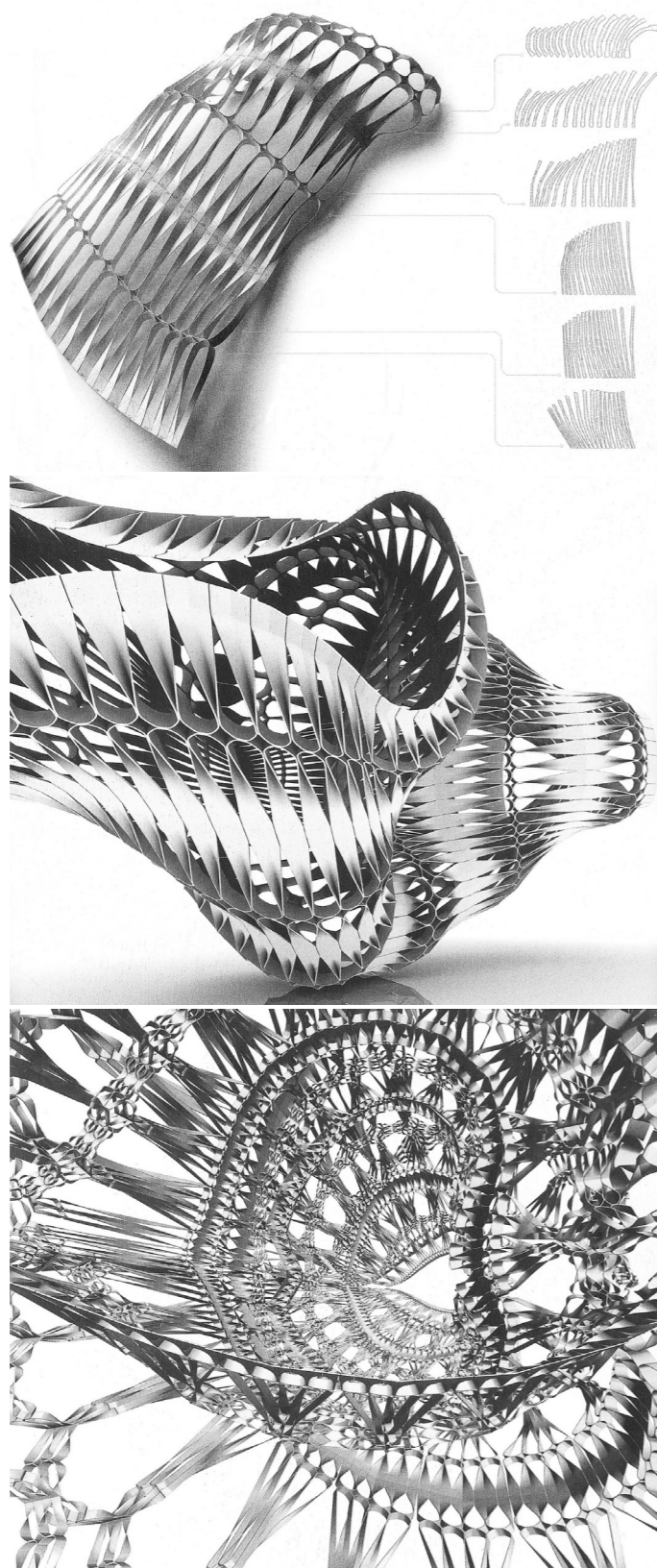


figure 1.7: Achim Menges et al, paperstrip morphologies, 2004-2005 in M. Hensel, A. Menges, et al. (2006). *Morpho-ecologies*. London, Architectural Association

As a group of 42 students and four tutors in the AADRL studio we discussed design projects in terms of process but rarely in terms of aesthetic outcome despite evidence in the work that we were all operating with the same unspoken, qualitative criteria. It troubled me that the work remained diagrammatic and that there seemed to be a lack of concern for how it might be translated into physical, built form. We evaded pragmatic issues to pursue an aesthetic focus. Yet the work was often demonstrated through renders and collages in existing contexts. I found there was some sort of power in the tension (as I have come to know it) in the relations between the rectilinearity of sites such as the Barbican and the smooth-ness of our systemic, 'emergent' formal interventions (figure 1.8).

In the introduction to this document the bundle of issues that I carried away from the AADRL was outlined. When the issue of iterative making practices was addressed in relation to the Langs Bach project, emergence was peeled away from the AADRL bundle. Coming forward out of the work wasn't the kinds of form associated with emergent architecture, but a sense of emergence in the design process. It underlined an idea that had followed the work for some time; emergence wasn't just a model through which to understand particular kinds of architectural form, but through which to understand the design process more generally.

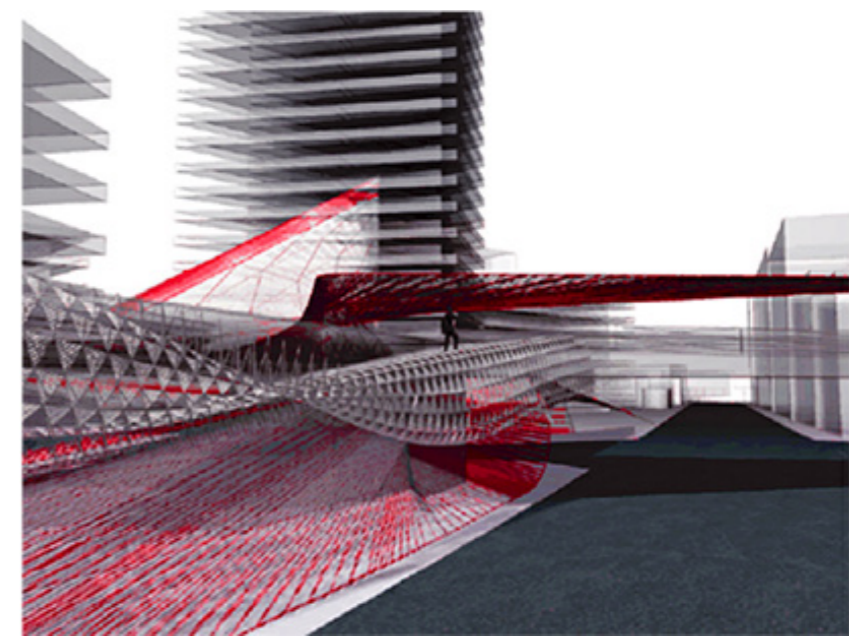


figure 1.8: d_rive (M.Davis, S.Hatzellis, A.Stern), preliminary sketch of *Barbican project* (2002)

Modernist Tectonics

Kenneth Frampton's *Studies in Tectonic Culture*²² is a series of essays that run from discussions of Greco-Gothic and Neo-Gothic through to the work of Mies van der Rohe, and Carlo Scarpa amongst others. His aim is to show a persistent concern for the tectonic across time and cultures. True to the subject of tectonics as he unfolds it, in his introduction, Frampton resists a singular textual definition of 'tectonics' in relation to architecture. He leads off with "Inasmuch as the tectonic amounts to a poetics of construction it is art, ..." ²³ and goes on to carefully assemble parts of arguments from others to the effect of providing the reader with a fuller sense of how the term has developed and of what it might mean.

Frampton quotes Adolf Heinrich Borbein who writes:

"Tectonic becomes the art of joinings. "Art" here is understood as encompassing tekne, and therefore indicates tectonic not only of building parts but also of objects, indeed of artworks in a narrower sense. With regard to the ancient understanding of the word, tectonic tends toward the construction or making of an artisanal product. ... It depends much more upon the correct or incorrect applications of the artisanal rules ..." ²⁴

To distil a working definition that this discussion might proceed upon, Frampton gives an overall sense that 'tectonic' denotes an assembly of parts according to a set of norms (criteria or rules) inflected by localised conditions of landscape, climate, time or epoch and ways of making. Tectonic architecture carries with it a quality of the everyday. It is inseparable from the craft of the artisan and shows a strong concern for lineages through which knowledge is passed and developed.

Further on in the introduction Frampton discusses the division of Gottfried Semper's ...

"... primordial dwelling ... into four basic elements: (1) the earthwork, (2) the hearth, (3) the framework/roof, and (4) the lightweight enclosing membrane. On the basis of this taxonomy Semper would classify the building crafts into two fundamental procedures: the tectonics of the frame, in which lightweight linear components are assembled so as to encompass a spatial matrix, and the stereotomics of the earthwork, wherein mass and volume are conjointly formed through the repetitious piling up of heavyweight elements." ²⁵

²² Kenneth Frampton, "Introduction: Reflections on the Scope of the Tectonic," in *Studies in tectonic culture : the poetics of construction in nineteenth and twentieth century architecture*, Kenneth Frampton (Cambridge, Mass.: MIT Press, 1995).

²³ Kenneth Frampton, "Introduction: Reflections on the Scope of the Tectonic," in *Studies in tectonic culture : the poetics of construction in nineteenth and twentieth century architecture*, Kenneth Frampton (Cambridge, Mass.: MIT Press, 1995), 2.

²⁴ Adolf Heinrich Borbein, "Tektonik, zur Geschichte eines Begriffs der Archäologie," *Archiv für Begriffsgeschichte* 26, no. 1 (1982).

²⁵ Kenneth Frampton, "Introduction: Reflections on the Scope of the Tectonic," in *Studies in tectonic culture : the poetics of construction in nineteenth and twentieth century architecture*, Kenneth Frampton (Cambridge, Mass.: MIT Press, 1995), 5.

Frampton thus privileges the tectonic frame as a primary spatial device, sets the surfaces and screens that otherwise define space as secondary devices, and simultaneously conflates frame and surface. While his reading of Semper in order to achieve this might be seen as contentious,²⁶ with it Frampton forms a useful background against which to examine the strand of modernist tectonics that my practice belongs to. The intention is to subsequently contrast this local, modest, typological, modular economy with the high-brow architectural modulations of parametricism in terms their differing approaches to composition.

Frampton ratifies Semper's model with: "The general validity of Semper's Four Elements is borne out by vernacular building throughout the world ..."²⁷ Whether New Zealand has a 'vernacular' is a separate discussion, but it does have a modern timber building tradition that certainly fits Frampton's thesis. Figures such as Vernon Brown in the 1940s and 1950, the various members of Group Architects in the 1950's and 1960's, Claude Megson in the 1970's and 1980's, Ken Crosson in the 1990's and 2000's and most recently Mike O'Sullivan have explored this modern timber building tradition in their work. Collectively they define a particular architectural lineage that will be referred to from this point as the 'Auckland School'.²⁸

Vernon Brown (1905-1965) was a lecturer at the School of Architecture at Auckland University College (as it was in 1946) when the "Architectural Group" formed. They were a collective of second year students out of which a cluster of significant architectural practices were to develop including Group Architects to begin with, and later on Wilson and Juriss.²⁹ Ivan Juriss (1924-2014), held to be "the craftsman" by fellow Group member Allan Wild (1927-)³⁰ was eventually to become the 'J' in what is JASMAX, currently New Zealand's largest architectural practice.

The Architectural Group's manifesto famously (locally) proclaims "... overseas solutions will not do. New Zealand must have its own architecture, its own sense of what is beautiful and appropriate to our climate and conditions."³¹ That this sort of sentiment was common to the modern movement internationally, and that there is a tension between the Architectural Group's intention toward a New Zealand architecture, and the extent to which they were informed by overseas influences is not

²⁶ Frampton's reading of Semper here seems forced as for Semper the screen is the primary spatial element and the frame is a secondary support. See Gottfried Semper, "Style: The Textile Art," *The Four Elements of Architecture and other writings*, Trans. Harry Francis Mallgrave and Wolfgang Herrmann, Cambridge University Press, Cambridge (1989).

Also see Brent Allpress "The ornamental conditions of architecture" MArch diss. University of Auckland, Auckland, 1995.

²⁷ Kenneth Frampton, "Introduction: Reflections on the Scope of the Tectonic," in *Studies in tectonic culture : the poetics of construction in nineteenth and twentieth century architecture*, Kenneth Frampton (Cambridge, Mass.: MIT Press, 1995), 6.

²⁸ This strand is one of several possible understandings of the institution – it is not monolithic.

²⁹ Julia Gatley, "Introduction" in *Group Architects: towards a New Zealand architecture*, ed. Julia Gatley (Auckland: Auckland University Press, 2010), 3.

³⁰ Julia Gatley, "Who was in the Group?" in *Group Architects: towards a New Zealand architecture*, ed. Julia Gatley (Auckland: Auckland University Press, 2010), 9.

³¹ Group Architects, *On the necessity for architecture: the manifesto of the Architectural Group* (Auckland: Abel Dykes, 1946).

missed by architectural historians such as Andrew Barrie.³² Frampton's concluding remarks bear relevance in relation to this observation: "One may argue that the tectonic resists and has always resisted the fungibility of the world. Its tradition is such that it has constantly sought, at one and the same time, both to create the new and to reinterpret the old."³³

Group Architects brought their modern influences and intentions together in the context of New Zealand's timber building tradition. They did so through their drawing boards and through their tool belts – the personnel of Group Architects and Group Construction Company overlapped substantially. They produced a range of timber framed domestic dwellings that is now discussed as seminal body of domestic architectural work, the legacy of which persists and is felt particularly keenly in the Auckland region. Looking across the work – well documented in Julia Gatley's book *Group Architects: Towards a New Zealand Architecture*³⁴ – it might be characterised as simple-form, (but) carefully articulated timber volumes. Exposed timber roof framing; raking, timber sarked ceilings; timber clad interiors; built-in timber furniture that often operates as spatial dividers; timber framed windows; timber wall cladding – expressed sheet materials to the interior, weatherboards to the exterior; and timber floors that at times stepped with the slope of the site (figure 1.9). Closer inspection reveals that the buildings are often composed as a collection of planar surfaces articulated by the rhythm of the material, the joins between plywood sheets for instance whether they be butted or beaded. Fenestration was often grouped into larger elements and articulated via the rhythm of timber mullions (figure 1.10). The exception to this rule of the planar surface might be the built-in furniture which, while rectilinear, defined volumes in mid space that might be seen to take on the compositional role of a floating mass. The joining of vertical to horizontal planes, becomes a point of focus that is often managed through (1) a negative detail of sorts set between (2) surfaces that are somehow different – different materials, or a different type of timber cladding, or (if nothing else) a different colour (figure 1.11). The result is that the primary architectural components such as floor, wall, and ceiling elements are formally defined as separate parts.

The work is tectonic in that it consists of parts in part-to-part relationships within clearly defined, carefully composed wholes. That the particular tectonic quality of the Group's work might be described as being 'timber modular' has much to do with the materials they were using. The sizes of the sticks of timber and the sheet sizes of the plywood and glass for instance might be initially established by the physical limitations of the material, building codes and manufacturing capacities; and the maximum spans of structural and cladding elements. But it seems that as these sorts of constraints are worked with, eventually they become criteria upon which composition is governed. To reinforce Frampton's point, they become (localised) compositional norms.

32 Andrew Barrie, "Aesthetic Robin Hoods: The Group and Japan, California, Scandinavia" in Julia Gatley (ed.) *Group Architects: towards a New Zealand architecture* (Auckland: Auckland University Press, 2010), 209-216.

33 Kenneth Frampton, "Postscriptum: The Tectonic Trajectory, 1903-1994," in *Studies in tectonic culture: the poetics of construction in nineteenth and twentieth century architecture*, Kenneth Frampton (Cambridge, Mass.: MIT Press, 1995), 375.

34 Julia Gatley ed., *Group Architects: towards a New Zealand architecture* (Auckland: Auckland University Press, 2010).



figure 1.9: Group Architects, First House (1949)
Group Architects Collection (GP3), Architecture Archive, University of Auckland Library



figure 1.10: Group Architects (Jim Hackshaw), George House (1951)
photography: Barry McKay Industrial Photography
Group Architects Collection (GP12), Architecture Archive, University of Auckland Library



figure 1.11: Group Architects, Juriss House (1953)
photography: Simon Devitt

An encounter with the Auckland School

As a student at the University of Auckland in the early to mid-1990's, my exposure to modernism was limited to surveys of European modernism conveyed through photographs in books (including the 1990 reprint of Frampton's *Modern Architecture: A Critical History*³⁵) and lecture slides presented by theorists and historians who also taught in the design studio. Composition was foregrounded by my teachers (but) as an outcome disconnected from a process. 'A composition' was discussed as a thing, an overall existing condition consisting of parts in (fixed) hierarchical relations. Each project was presented not as the outcome of a design process but, it seemed, as a moment of perfection; an idea that had floated off the beautiful mind of the architect genius and materialised; an idea to be emulated but not replicated. It was daunting. I recall vividly a discussion with one of my colleagues where we asked one another "How do you design?"³⁶

In my experience, modernist tectonics implicitly holds design outcome separate from design process.³⁷ Reasons for this could be argued to include modernism's historical reliance upon mass print media to spread an agenda through carefully composed photographs and complete drawings. *Arts & Architecture* magazine's "Case Study House programme" (1945-1966) with its reliance upon the photography of Julius Shulman is a case in point albeit one that is fairly extreme. The dissemination of the modernist agenda through curated images of this kind doesn't impart any sense of how the work actually comes into being. Even sketches tend to depict complete projects – all very tidy, nothing out of place, little repetition, certainly no scribbles. The modernist romance of the 'napkin sketch' sits in this same space. Much of the curation of this work resists communicating a sense of the design process and what that entails. On the contrary, this kind of media is invested in the idea of architecture being the work of 'genius'. With the separation of design outcome from design process by virtue of the media by which it communicates with itself, the critical framework through which modernist tectonics might be expected to evolve excludes consideration the principle means of critical development in architecture – making with architectural media. Instead, the evolution of modernist tectonics has occurred through a critical framework that is narrowed to consist of images of itself. The result is a tight circularity in which things rapidly fall into and out of 'style', and the critical development of the field is stifled. Further, making practices in the field are marginalised meaning that the actual work of the architect goes undisclosed and unrecognised, and the myth of the genius is reinforced.

35 Kenneth Frampton, *Modern Architecture: A Critical History* (London: Thames and Hudson, 1990).

36 In conversation with David Giera circa 1991.

37 In his PhD dissertation from 2004 Shane Murray argues this to be an issue for the discipline of architecture generally. He articulates that reasons for this include the appeal for authorisation to discourse external to the process of what architects actually do. See Shane Murray, "Architectural Design and Discourse." PhD diss. RMIT University, Melbourne, 2004, 162. While his argument still holds, the situation described by Murray in 2004 is changing as demonstrated by the enormous increase in PhDs by practice that have now been completed and are currently in progress.



figure 1.12: Group Architects (Jim Hackshaw), Thom House (1954)
photography: Simon Devitt

In 1992 I had the privilege of being taught by Jim Hackshaw and Claude Megson in the design studio at the University of Auckland's School of Architecture. Jim Hackshaw (1926-1999) was a member of Group Architects until 1958. He also had peripheral involvement in the Group Construction Company. In 1952, with the benefit of a government scholarship, he travelled to Paris to study and work. This gave him opportunities to pursue a range of architectural interests that included the work of Le Corbusier and historic courtyard buildings.³⁸ He returned to Auckland early in 1954 to produce what is acknowledged as his 'tour de force' in the Thom House (figure 1.12).³⁹

Claude Megson (1936-1994) was from the generation of architects after Jim. He was concerned with domestic spatial sequences to the effect of celebrating the everyday, particularly in relation to the domestic. He brought the same general spatial/programmatic condition to each new project, whether his or his student's where it was adapted to address the different conditions and potentials of each. It was a kind of mental diagram of predispositions or kinds of relationships between programmed spaces that constituted a 'house'. It was informed by Claude's own sense of cultural and behavioural propriety. His Master of Architecture thesis *Formal aspects of the house: a philosophical discourse on the family house in Auckland*⁴⁰ can be read in part as a demonstration of that condition, even if he didn't refer to it as such. In each new project, in its application and exploration through his drawings, the spatial/programmatic condition would find a very different form according to the specifics of brief and context that the project presented. Interlocking or separated spaces became points of celebratory architectural focus – mezzanine to void was a favourite spatial adjacency that he seemed determined to conjure. Spaces of isolation and contemplation were discussed and articulated as such. The library in the tower at the Cocker Townhouses was a case in point (figure 1.13).⁴¹

The Hackshaw/Megson studio was a very direct encounter with the Auckland School. They were two very different designers from two different times with differing points of focus in their design process: simple compositions from simple parts for Jim; spatial sequences for Claude that developed specificity and complexity through the drawing. While the problem of a lack of language for how design was brought into being was present in the studio, it was accompanied by the actions of Jim's and Claude's respective drawing practices. They were to prove key to identifying and addressing that absence. Chapter four discusses this key in relation to composition as both noun and verb. It picks up on Hackshaw's Thom house and Megson's teaching.

38 Julia Gatley, "Who was in the Group?" in *Group Architects: towards a New Zealand architecture*, ed. Julia Gatley (Auckland: Auckland University Press, 2010), 12.

39 Julia Gatley, "Who was in the Group?" in *Group Architects: towards a New Zealand architecture*, ed. Julia Gatley (Auckland: Auckland University Press, 2010), 13.

40 Claude Megson, "Formal aspects of the house: a philosophical discourse on the family house in Auckland." MArch diss. University of Auckland, 1970.

41 Claude Megson, Cocker Townhouses (Wood Street, Ponsonby, Auckland: 1975). See Megson Archive, University of Auckland.



figure 1.13: Claude Megson, Cocker Townhouses (1975)
photography: Patrick Reynolds

A situated practice

Modernist tectonics paints a picture of the architect as an autonomous body who delivers rather than develops design outcomes. But this picture is unable to account for how design actually occurs. With the privileging of design outcome as the way to tell the story of the project, most agents beyond the autonomous architect are pared back, their effects go unrecognised, the work of design is undisclosed and its value remains implicit. Yet this field is deeply invested in making: in making beautiful drawings and models; in fabricating building elements and buildings; in being onsite and hands-on (figure 1.14). How parts relate to one another is central to this field of practice, and yet it is unable to account for how relations between parts are brought into being. Modernist tectonics holds composition (as a noun) as an explicit concern in that it involves parts and how those parts go together. Composition as a verb – an activity that leads to the beautifully made artefacts the field emphasizes – remains an implicit concern.

With parametricism traditional concepts of composition are encompassed within concepts of “organisation” and “articulation”⁴² where each term is used as both noun and verb. Indeed, parametricism has tended to present a discussion of process that concerns different agents and the interactions between them.⁴³ But while it looks like it might, rarely does that discussion take us inside the actual doing of the design – it often involves a rhetoric of process. Seldom is there a disclosure of the selective criteria by which agents are admitted to the parametricist’s formal experiment – perhaps it has to do with an agent’s potential to be represented in software in a way that will in turn deliver particular kinds of formal outcomes. Examination of the agency and the argument for particular software in producing the type of outcome sought is similarly slight. On the whole, discourse concerning the aesthetics of parametricist outcomes is uncommon. My intention in the following chapter is to take the reader inside a design process that draws from both of these fields.

What I took to the AADRL as a student was an ability to ‘turn my hand’ to making with whatever media was called for, and to do so in a particular mode – focused, iterative, and skilful. In the time since it has become clear to me that through the experience of the AADRL, through working in this manner with implicit, qualitative criteria, I developed a heightened awareness of the qualitative aspects of architectural composition that is not confined to parametricism. I have developed a related attention to systems, not so much to the parametricist’s system of self-similar geometries, but to systems of relations between different things.

⁴² Patrik Schumacher, *The Autopoiesis of Architecture, Volume II: A New Agenda for Architecture* (Chichester: J. Wiley, 2012), 50.

⁴³ See for instance Greg Lynn *Folds, bodies & blobs : collected essays*. Brussels: La lettre volée, (1998).

Ark’s work in New Zealand draws on my exposure to new technologies in an exploration of emergent qualities of compositional relations between modest, generic and very selectively modulated parts. The parts might be understood as differentiated systems that operate organisationally and spatially at different scales. They include types of frame, surface and volume that fit within Frampton’s thesis but with Ark they are all semi-autonomous (rather than conflated) and compositionally reconfigurable within an iterative design process.

While my parametricist contemporaries are making ‘blobs’, I make modernist tectonic ‘boxes’ but I have come to understand boxes in different way, one that has been inflected and formed and honed by an ideology that is alien to the field (parametricism). At the core of that different understanding lie issues of emergence, composition and making.



figure 1.14: Ivan Juriss (left) and Bret Penman of Group Architects onsite at the Second House (circa 1950)
Penman family collection

TENSION

An emergent quality of the design project ecology



Chapter 2

This chapter is the story of tension in the work of Ark. It is told largely as reflective accounts of experiences at the AADRL in parallel to that of a specific architectural project in New Zealand nine years later. The front part of the story introduces the notion of a 'design project ecology', the issue of composition in the work, and the evolution of tension as a quality of composition in the work. This is followed by three discussions that sit alongside one another to demonstrate particular aspects of the design project ecology: tension in the compositional outcome; knowing-through-making; and a discussion of the larger tension underlying the practice.

Tension is an on-going sense of 'tightness' between (often multiple) things that pull in different directions while remaining often uncomfortably bound together. In terms of composition, 'harmony' is commonly discussed as an ideal state of 'whole-ness' or 'one-ness' that is to be strived for. 'Tension' in some respects is the opposite in that it involves a not-quite-rightness, or the two parts not being 'as one', or that they feel ready to break apart. It is productive in that it acknowledges different forces.

The design project as an ecology

'Ecology' is commonly taken to refer to the branch of biology dealing with relations and interactions between organisms and their environment, including other organisms.¹ Gregory Bateson expands the notion: "Ecology, in the widest sense, turns out to be the study of the interaction and survival of ideas and programs (i.e., differences complexes of differences, etc.) in circuits."² He uses the idea of ecology as a way to explain the complexity and interconnectedness within bio-systems, psychiatry, and economies among a range of others. In short, he takes an ecology to be a complex system that encompasses a vast variety of different interrelated things (or agents) that have effect (or agency) on one another.³ It is an evolving set of constituents and their relations.

I have come to view the design project as an ecology. The range of agents in the design project ecology includes the emerging parts of the design. It stretches to include others directly connected to the design task such as the drawing media used; the client; and the availability of building materials. But it stretches again to include the more circumstantial and vague: the lack of a sharpener for the pencil; the coffee the client had before the meeting; the weatherboard they saw in the magazine while they were having the coffee. The impacts of agents on one another and on the whole vary over time and with circumstance.

Approaches to making are an issue in the design project ecology because it is through the media, tools and actions of the making that the interactions between agents occur and gradually aggregate to become things and relations between things that may in turn have agency themselves.

1 Dictionary.com, <http://dictionary.reference.com/browse/ecology?s=t>, accessed 02.07.14, 3.57pm.

2 Gregory Bateson, *Steps to an Ecology of Mind* (San Francisco, Chandler Pub. Co., 1972), 491.

3 Gregory Bateson, *Steps to an Ecology of Mind* (San Francisco, Chandler Pub. Co., 1972).

One observation made through the research is that Ark's project ecologies tend to consist of many things that give rise to 'tense' relations. The argument is that tension is actually a quality of relation that is sought in the work. It is an ever-present criterion upon which things and relations are evaluated in the making. As such, affects (such as tension) become ways of 'knowing' – knowing, for instance, that things and relations are aggregating into a particular kind of formation inside the ecology.

Composition in the work of Ark

At the May 2010 PRS I presented a series of physical models to the panel. "They're all the same!" one of the panelists exclaimed. She was referring to a compositional quality that she saw as being common to them all. We began a discussion of craft and related compositional qualities that were apparent in the models. While craft gradually faded from the research, the issue of composition remained and unfolded as the background against which tension, provisionality and poise (as qualities of compositional relation) were discussed.

When the word 'composition' was first uttered in the discussion of the models, I flinched. It was such an old fashioned idea. It had been subsumed at the AADRL within concerns for the geometric/material systems we made, and I associated it strongly with my modernist tectonic background (with all the implicit problems I felt) that I had travelled a long journey to escape. But this discussion at RMIT wrapped the idea of 'composition' in issues of geometric/material systems (we discussed hierarchies between the systems) and emergence (we discussed the act of composition as an emergent condition). So composition entered the frame by association with other issues that I was keen for the research to address at the time.

Across the course of the research composition (verb) – in relation to the Auckland School and modernist tectonics more generally – came to be understood as the bringing into being of parts and relations between parts through making inside the larger design project ecology. The ecology set traditional tectonic concerns for conditions such as landscape, climate and time⁴ in play as agents in the same space as agents that were more circumstantial, fleeting and ephemeral. The compositional outcome of the design project ecology was an aggregate of parts and relations. Tension, provisionality and poise were both qualities of compositional relations and affects felt as those relations were brought into being inside the ecology.

4 Kenneth Frampton, "Introduction: Reflections on the Scope of the Tectonic," in *Studies in tectonic culture: the poetics of construction in nineteenth and twentieth century architecture*, Kenneth Frampton (Cambridge, Mass.: MIT Press, 1995).

Langs Bach: a project vehicle

By way of introduction, the Langs Bach was a house designed for my wife's two cousins. Their parents had passed away leaving their two daughters the place where they had spent their family holidays together as children. The site slopes northward down to the sea and has expansive views out to the Hauraki Gulf. The property had been in the family for four generations and the house that stood on the site dated from the late 1930s (figure 2.1). But the house had become decrepit and the site overgrown. The clients decided to build a new house on the same site for their own families to grow into.

The project outcome is essentially a large timber terrace under a timber pergola, set on the flat at the top of the slope, on the site of the old house. Set back from the edges of the terrace are two timber clad volumes that are tapered in plan. The larger contains the domestic functions; the smaller is a boat store (figure 2.2).

What distinguishes this project amongst the five discussed in this PhD is the level of personal involvement I had in it: I was the architect, then the main contractor. I was involved in the demolition of the old house, I recycled the timber, and I made the interior doors that slide between the two living spaces. I recycled the old mirrors so that the grandchildren could look into them the same way their grandparents did. This depth of personal involvement was perhaps telling in terms of the realisations made through the project, and the central role it plays in the research as a result.

Prior to consent and contract documentation at Langs, the project ran through three phases of design development before agreement was reached as to the 'final' design. What distinguished the phases from one another was the level of speculation felt within each one. The first phase sought to test a general direction and how far the client would go with it (figure 2.3). The response to the first phase led to a more conservative second phase that was more concerned with implementing programme and client requests through space planning (figure 2.4). Phase three saw a more specific direction for the project develop and the level of speculation rise within to reinvigorate it (figure 2.5).



Figure 2.1: Existing house at Langs (2009)
photography: Sajeev Ruthramoorthy



figure 2.2: Langs bach (2012)
photography: Sajeev Ruthramoorthy

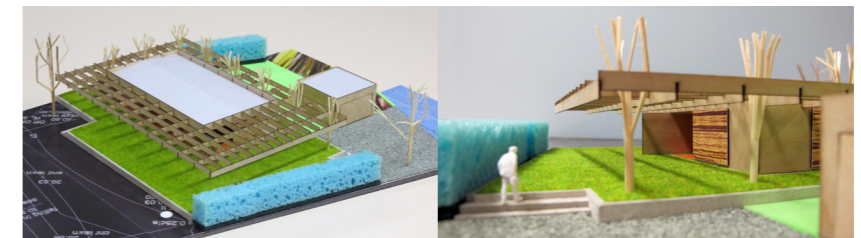


figure 2.3: Langs phase one model
photography: Sajeev Ruthramoorthy

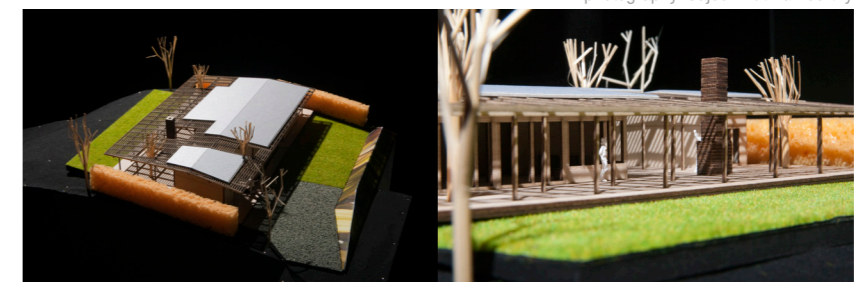


figure 2.4: Langs phase two model
photography: Sajeev Ruthramoorthy

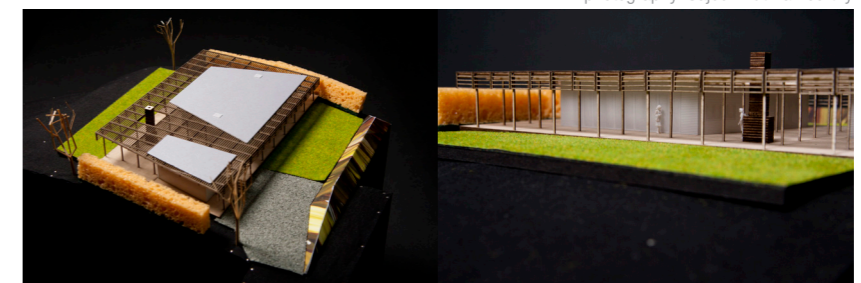


figure 2.5: Langs phase three model
photography: Sajeev Ruthramoorthy

Leading up to the Langs Bach project the research had been concerned with design process. My intention going into the project was to somehow record and subsequently communicate an overall sense of the design process as I was engaging with it. In the end the process was recorded through notes in my sketchbook (figure 2.6). However, the level of self-consciousness required to carry out such a record proved a significant encumbrance to the process I was trying to record.

I managed to record (only) the beginning of phase one, and chunks of phase two. The notes contain descriptions of the work I was doing, how I was feeling about it, and in some cases reasons for what I was doing and why I was feeling that way. It is largely through these notes that I became aware of many of the issues that the research has followed, and it is also through the notes that I began to develop a vocabulary through which to frame and discuss the work as research.

THIRD ONE.

- physical symptoms of stress (ache at skull / eye the spine / etc)
- seems 'an uncertainty in a sense of stress' this reason
- remark this is 'treatment' the moments of relaxation - fun, encounter in the work.
- when I make a first model, I am constantly telling myself 'this is really too low'. 8 days later
- when I make a first model, I lack a sense of certainty (lack of resources? due to lack of depth of knowledge of project specifics at this an early project stress?) or a best of preparation or solution or ~~idea~~ but if it is not perfect at this outset ^{conceptually} in the intention uncertainty of 'that's not it / that's too heavy / how are you going to load that / but rather too expensive' - self-criticism (and the tension between craft & craftiness?)
- this space where I avoid this is with the question is now, where I have ^{less} bars upon which to judge. on site model. But once the question is resolved the self-criticism is surface.
- ~~experience~~ expansion of self-criticism
- craftiness as the means to keep the space up, to keep the question alive, to maintain judgement & self-criticism
- craft as the means to understand deeply & determine resources

figure 2.6: sketchbook notes

Tension in the compositional outcome

Note from 20.02.11 (in relation to modelling in Rhino):

“... the project isn't feeling right yet. I have made another option involving a ramp to the entry. This was a matter of urgency, I'm getting uptight over this detail – I need it to be resolved through discussion before I go on.

The ramp option feels fussy: it is narrow; it forces an engagement with the front door and in that respect it feels very formal for a bach. The ramp irks me slightly due to that feeling of fussiness but I am living with it – it's OK, it works in relation to the whole (figure 2.7). I need to talk to Vanessa. Through modelling this 10th option (a week after the first) and the discussion that occurred immediately afterward, I realize the ramp retains a higher level of connectivity between the components. In the first option the deck lacks continuity as a surface and that lack of continuity both emphasized the autonomy of the garage relative to the dwelling, and of the deck relative to the pergola.

(Again) the project is compositionally dependent upon the tension between the pergola and the deck, and that the vertical walled components sit below the horizontal components in the hierarchy of relationships within the project. This hierarchy is consistent with the sketches made at the inception of the project which expressed concerns for how to occupy the site in multiple ways rather than explicit concerns for a building (figure 2.8). The edge of the deck and pergola should track together to reinforce this condition. Any deviation from having the edges of the pergola aligning vertically with the edges of the deck has been met with a sense of project dissolution, like the point of the project has been lost, and it comes complete with head shaking, wincing and puffing cheeks ...”

This excerpt from my notes was the first sign of a particular quality of relation in the project that was eventually to be termed 'tension'. It operated between the grassed terrace, the pergola and the trees – in the juxtaposition between the manufactured, horizontal parts and the grown, vertical parts. In the weeks that followed the first of the notes the issue of parts made way for the idea of a hierarchy of parts, which in turn made way for the explicit consideration of the broader issue of composition and the specific issue of tension. By the end of phase two of the design process, the principal tension in the project lay between the deck-pergola pairing and the trees that were to perforate them. Phase three of the design process saw the removal of the trees, but the desire for the tension they originally established with the deck-pergola remained. The walls were eventually required to step into the compositional role of the trees – the walls were to be juxtaposed with the pergola. However, certain properties of the walls (as built) undermined their capacity to play that elevated compositional role.

Following the removal of the trees in phase three, a white polycarbonate cladding to the walls was proposed. It was to contrast with the timber deck-pergola. Phase three unfolded with this as the primary compositional relation. However, just prior to beginning consent drawings the client requested that the cladding be changed to a dark-stained board and batten. I complied with the request, but the level of irritation I felt in doing so forced me to consider why I felt that way. I wasn't putting my finger on the idea that tension was something I was actively seeking in the composition, nor on how tensions were set up in the composition. It was only through making the first draft of the compositional taxonomy discussed in the following chapter that I began to connect these things.

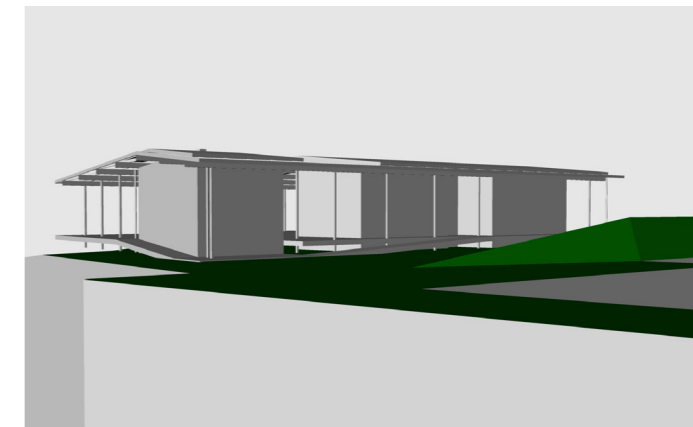


figure 2.7: Langs phase two, option 10, Rhino model

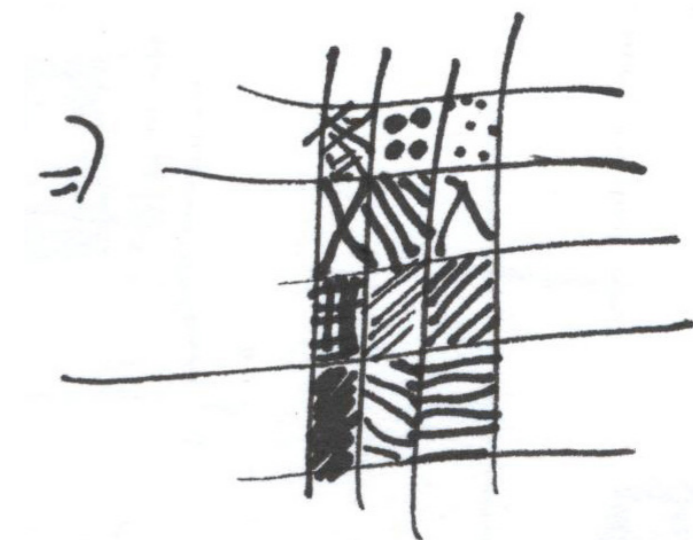


figure 2.8: Langs initial 'quilt' sketch

Knowing-through-making

Note from 30.12.10 (in relation to drawing):

“... I am interested in the ‘+’ plan figure generally (figure 2.9). It might start as a generic figure but it develops a specificity in relation to external conditions – site, brief etc. Unfortunately it has become too distorted – it works programmatically but it is not pretty (as a figure) ... (figure 2.10).”

Drawing is a means to develop relationships and sets of relationships. It is a means to isolate specific relationships of concern. Modelling is a means to assemble the set of relationships proposed individually in the drawings. It expresses more fully the relationships between the spatial and material parts and the overall organizational system.”

Note from 28.04.11 (in relation to the finished phase two model):

“Andrew Barrie stands at the open door of my office. He points at the model.

‘It’s not quite there’, I say.

‘Why?’

‘Because the plan figure lacks clarity – it is like boxes of space locked in conventional domestic relationships with one another and wrapped tightly in Gladwrap.’

‘But you’ll never experience the building as a plan form.’

‘I know, but it doesn’t change the way I feel about it.’”

From the beginning to the end of phase two of the design process, I struggled to maintain the clarity of the ‘+’ configuration of the walls in plan as the domestic programme was worked into it – the geometry felt like it wanted to be simple. In the struggle the pergola became stacked and set in place over the walls and that relation confounded the ‘+’. At some point late in phase two, I drew a diagonal line (which I took to be a wall) across a print of the grid of the pergola and something in the quality of the composition changed. I just knew that it was good and I let go of the ‘+’. In the mind-set of research by reflective practice, I recognised this knowing as the same kind of knowing that I had experienced nine years earlier at the AADRL.⁵

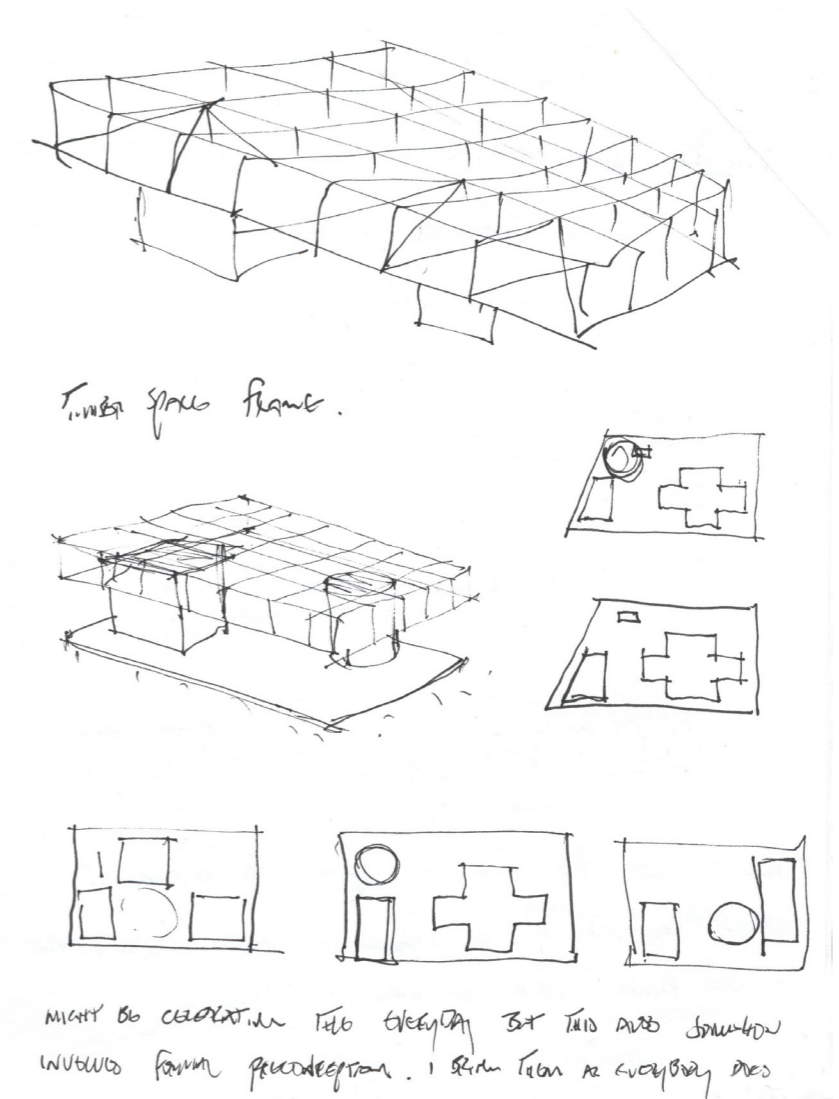


figure 2.9: Langs sketches. Interest in the ‘+’ figure is emerging

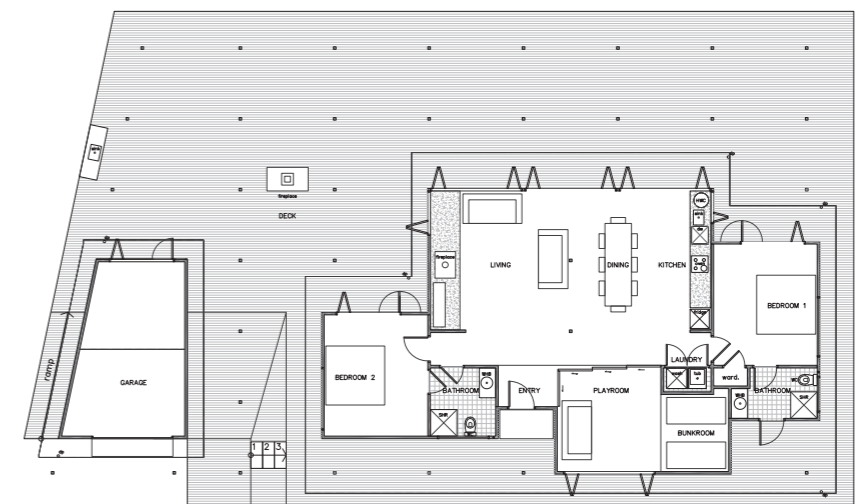


figure 2.10: Langs phase two plan

⁵ I have also written about these two projects – the Langs Bach and *Kinetetras* – in the following: Michael Davis, “Pursuing a sense of the emergent through craft practices in architectural design,” *Craft + Design Enquiry* 5 (2013): 49-71.

Three related outcomes marked my time at the AADRL. At the core was the design of a geometric/material system that eventually became a flexible, programmable tetrahedral space frame which we named 'Kinetetras'. The final design project involved envisaging the deployment of Kinetetras to define an urban lobby at the Barbican precinct in inner London. But between developing Kinetetras and the Barbican project, my two team-mates and I were invited to develop a full-scale, working prototype of Kinetetras, and to exhibit it at the Latent Utopias exhibition in Graz, Austria (figure 2.11). The prototype consisted of six steel tetrahedrons, pivot jointed together, that were operated by pneumatic actuators connected to their upper apexes. Attached to the underside of this structure was a surface consisting of 648 vacuum-formed plastic bubbles.



figure 2.11: d_rive (M.Davis, S.Hatzellis, A.Stern) Kinetetras, exhibited at Latent Utopias, Graz, Austria (2002)
photography: Steven Hatzellis

In the summer break of August 2002, I was charged with making the bubble surface (Figure 13). But in the background – having been at the AADRL for three of four terms – the project for the Barbican was pressing. We had poured a great deal of time and energy into the larger project, but still had no idea what it was, of how Kinetetras might be extended to define it, nor of what it would become at a body, building or city scale. I had to suspend my worry that we had only one term to run before this as yet unseen project for the Barbican was to be completed.

Notes from my sketchbook:

"I am sitting on a cow skin laid over the splintering timber floor of Vanessa's 100-year-old apartment in Amsterdam.

Each of the 648 half-bubbles is to be drilled at each of its three corners and at its apex.

Each corner hole has a brass eyelet turned into it.

Each corner eyelet is prised apart.

Three corner eyelets are connected together by a 5 mm diameter rubber 'O' ring.

The eyelets are closed (figure 2.12).

I started. I finished ten days later and I knew the larger project for the Barbican.

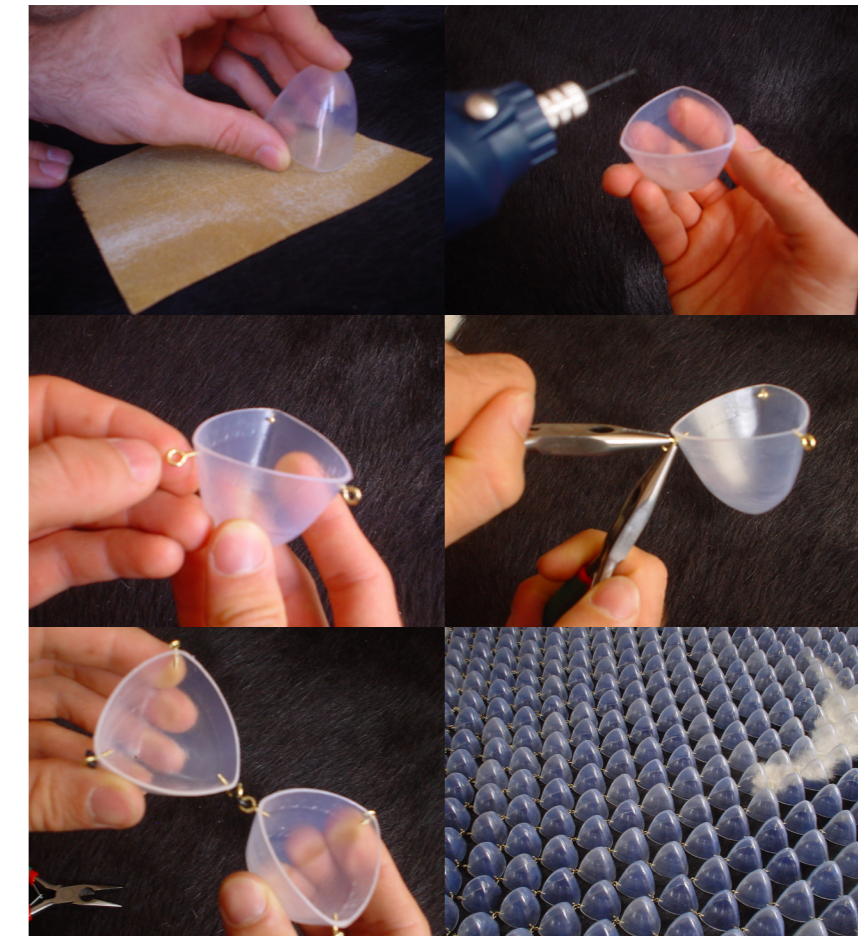


figure 2.12: making Kinetetras (August, 2002)
photography: Vanessa Ceelen

My notebook contained sketches (figure 2.13) made in breaks in assembling the surface that directed the project to completion (figures 2.14 & 2.15). It seemed to me that there was a direct link between the new ideas in my sketchbook, the laborious, iterative work of assembling the Kinetetras surface, and the intensity of the work carried out earlier in the studio at the AADR.

This account of ‘knowing’ the project for the Barbican through the making of the Kinetetras surface sits alongside the experience of vacuum-forming the plastic half-bubbles for the surface. In their making, the smell of the plastic over the hot element indicated when the plastic was ready to be sucked down over MDF molds, a sort of tacit way of knowing that something was ready to go through a change of state.

Donald Schön argues that the knowing of designing is in the doing of the designer.⁶ Peter Downton picks this idea up and moves on to unfold a discussion of the relation between representations and this kind of knowing. He begins with:

“A great deal of everyday designing involves drawing. This drawing may be done with a computer or a pencil – the concern here is with the process, the interaction between the ongoing making of a representation and the evolving knowing of the designer making the (probably partial) representation. It is a mistake to concentrate on finalised representations; they represent what was decided through the inquiry undertaken and attempt to communicate it. The drawing by which inquiry is undertaken is the personal, ongoing drawing of exploration that a designer employs. In this drawing, there is an exchange between the person designing and the marks already made in whatever medium. Those marks are the context for new marks.”⁷

The notion of a design project as an ecology suggests that the exchange isn't only between the designer and their marks but between a wider range of agents. Similarly the context that new marks are made in relation to isn't confined to those already made – old marks are but one category of agent given consideration when new marks are being formed. To expand on this idea through an account of my own drawing practice: I always have a seed of an idea before I draw. Most often it is a geometric entity of some sort – a line, shape or form – but never a fully formed image of a building. I move the pen in my left hand. My fingers press the pen to effect a line weight that varies across its length – heavy at the beginning, gradually becoming lighter toward its middle, to gradually becoming heavy again at the end. On one level there is purpose in establishing this quality of line as it is being made. On another there is purpose in making the geometric entity the line is part of. I focus on my pen, my hand and fingers, and the lines on the page. Only gradually as I tire, do I become more aware of the weight of my body on my right elbow on the table, the elongation of my neck on the left relative to the compression on the right, the tension in my left shoulder, the scuffing of my left forearm on the table.

6 Donald Schön, *The reflective practitioner: how professionals think in action* (New York: Basic Books, 1983).
7 Peter Downton, *Design Research* (Melbourne: RMIT Publishing, 2003), 101.

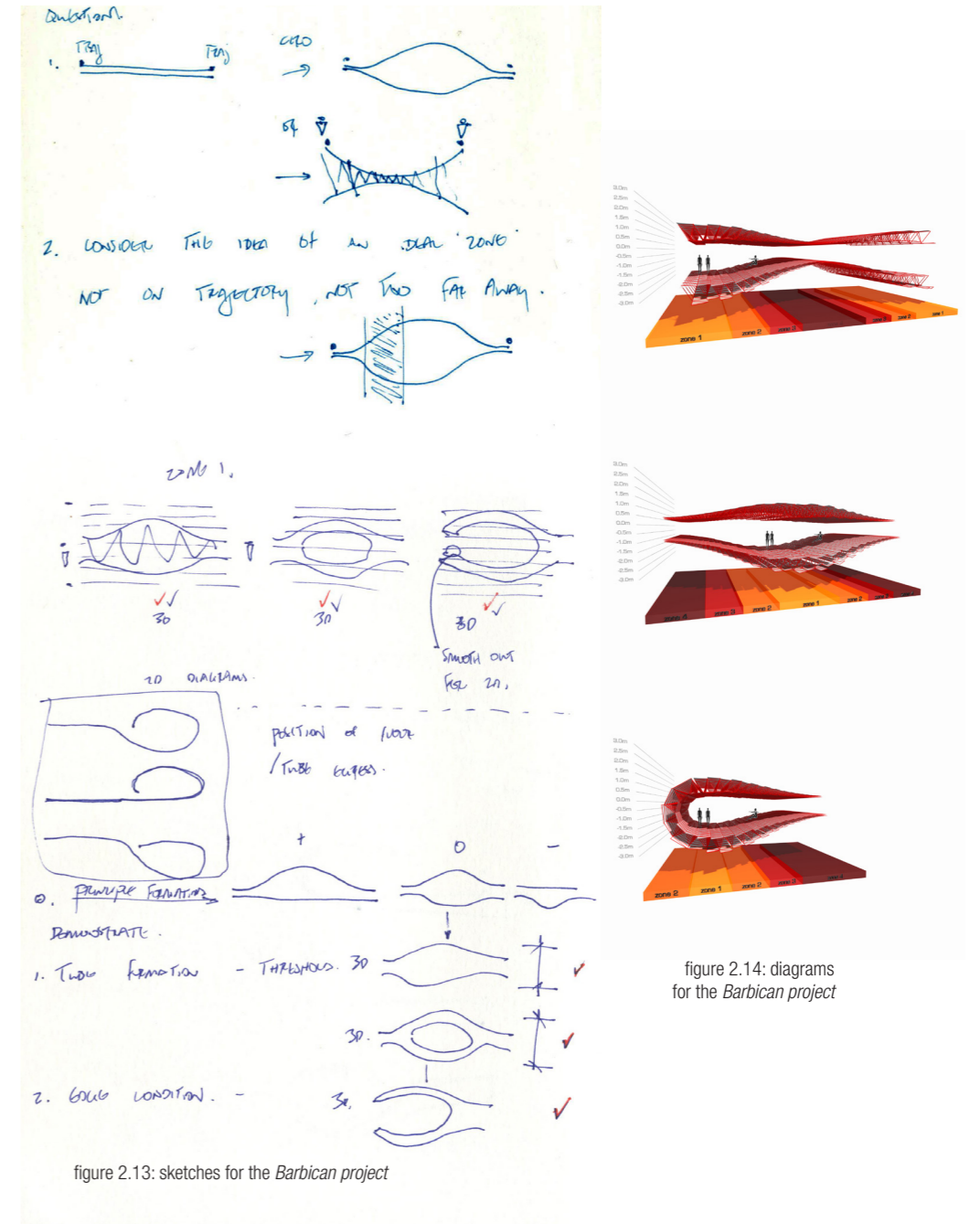


figure 2.13: sketches for the Barbican project

figure 2.14: diagrams for the Barbican project

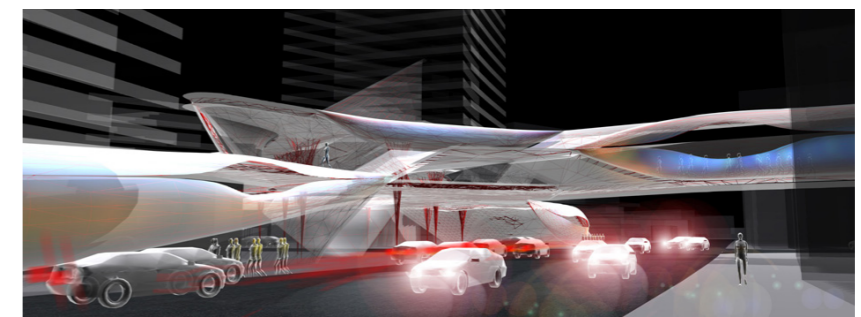


figure 2.15: d_rive (M.Davis, S.Hatzellis, A.Stern), Barbican project (2003)

Each line, as it is being drawn, is simultaneously evaluated in terms of its location, shape, quality, its relations to the lines neighbouring it, and its relation to the initial idea. Is the line good, bad or otherwise in terms of the geometric entity I am attempting to make? My response registers in my body (in a smile or a wince perhaps).

Agents in play here do include me as the designer and the drawing-in-the-making, but also others such as the flow of ink from the pen, the weight and texture of the paper, the surface of the table my forearm scuffs across, my physiological condition and the nature of the space it all takes place in. All of these hold agency in relation to the knowing that unfolds through drawing and making more generally. To return to the AADRL projects for a particular example, the knowing of the Barbican project that unfolded wasn't only to do with drawing in my sketchbook. Neither was it the result of simply pairing drawing in my sketchbook with assembling the Kinetetras surface. It also had a lot to do with the space the work was carried out in – Vanessa's apartment.⁸ With that surface the beginnings of a sense of the complexity of the relations between agents in the design project ecology that brought about the knowing of the Barbican project.

Phase shifts

Knowing gained through making accrues. John Dewey wrote "New ideas come leisurely yet promptly to consciousness only when work has previously been done in the forming the right doors by which they may gain entrance. Subconscious maturation precedes creative production in every line of human endeavour."⁹ To return to Langs, the diagonal line drawn across the grid there had been preceded by a protracted, iterative process of making. The irritation that surfaced in relation to the work is detectable in the sketchbook notes, but that irritation was indicative of the knowledge building up and reaching a sort of critical mass inside the ecology. The diagonal line catalysed it and the composition turned on it. The making of the Kinetetras surface in relation to the Barbican project was similar. Through the making of the Kinetetras surface, fragments of knowledge gained from prior work were made ready, and shifted through to a higher level where they cohered. So, with the knowledge gained from a lot of work building up, and being mirrored by levels of frustration and concern, drawing in my sketchbook in parallel to assembling the Kinetetras surface in the context of Vanessa's apartment catalysed a 'phase shift' in the larger design project. I felt it in my head lifting and in my eyes opening, and as a relief from the frustration – I knew something had happened by the affect it had on me.

⁸ Vanessa Ceelen was then my fiancée. She is now my wife.

⁹ John Dewey, *Art as Experience* (New York: Perigee / Penguin Group, 2005), 76.

Tension as an evaluation criteria

To return to the scale of drawing individual lines: The lines I tend to draw with my pen on paper carry a sense of tension in the variation of the line weight across their length. It is as if each line has been stretched between two points (like chewing gum) – thin in the middle, thick at the ends. Part of how I evaluate a line has to do with how much of this quality (the appearance of tension) is present in it. But its evaluation isn't so much visual and after the fact as it is immediate and embodied – that is, via the affective quality (of tension or 'tightness') that arises through the physical act of drawing it, and as part of the broader design project ecology. Similarly, tension works as a criterion of evaluation of the relations between compositional parts. In drawing the diagonal line across the grid of the pergola at Langs, there was an immediate sense of independence between the parts (between the orthogonal pergola and the diagonal wall). When I also felt tension as an affect I knew a relation between the parts had formed. When the diagonal wall became clad in white polycarbonate, in being set in relation to the raw timber of the pergola, the material difference between the parts increased, the tension increased and the relation between them became 'tighter' (figure 2.16). In these ways, both within and across the work, the design project operates as an ecology with high levels of interconnection brought about through the act of making and between very different aspects of the project. The process of making gathers more importance when we consider designing in this way, where smaller scales of action impact not just at the small scale but dramatically at the larger scale.



figure 2.16: Langs phase three model
photography: Sajeew Ruthramoorthy

A larger tension

As the term 'tension' gained agency through use, and as my attention to tension developed, I began to see it as a quality that was present not just in the Langs Bach project, it was present across Ark's work. It was the general state in which the design project ecology existed. It was the general state that Ark as a practice (ecology) operated in. The idea that this tendency toward tension was connected to some deeper, more fundamental tension underlying the practice was compelling. Initial investigations along this line suggested that a principal tension operated between my will parametricism while actually producing work in the field of modernist tectonics. Eventually I remembered where I had first set them in relation.

In parallel to the pursuit of systems and formal complexity in the AADRL studio, I took a seminar run by Brett Steele titled "Monography". The seminar involved reviewing a selected architectural journal over the course of its life. I selected *Arts & Architecture* knowing that it was the vehicle for the "Case Study House Program", which ran in the Los Angeles area from 1945 to 1966. One house per year was designed by architects that included Richard Neutra, Craig Ellwood, Charles and Ray Eames and Raphael Soriano. The Program had an intimate relationship with *Arts & Architecture*, a relationship that contributed to establishing Californian domestic modernism as an area of architectural discourse.¹⁰

I had first become aware of the Case Study House Program through the Hackshaw/Megson studio in 1992 (recalled in the previous chapter) where photos of certain houses had been presented as reference material, including the Eames House. The discussion of the Case Study Houses in the studio in 1992 keyed my peers and I into a broader discussion of the relationship Auckland's domestic modernism had to Californian domestic modernism, and of how both these locally differentiated forms of modernism were concerned with tectonic composition.

At the AADRL the Case Study House Programme appeared in my sights again, this time in its entirety, and with it came the ghost of the frustration I had encountered in relation to this kind of work at the School of Architecture in Auckland where there had been little discussion of the design process which brought it into being. But in being exposed simultaneously and intensively at the AADRL to two very different fields of architectural work (parametricism in the studio and modernist tectonics in the library) at some point it occurred to me that I might be able to understand the Case Study Houses in terms of geometric/material systems. What if the compositional parts – the roof, wall and floor planes, the floating masses, the posts and others of modernist tectonics – were thought of on the same terms as the kinds of geometric/material parametric systems we were developing in the AADRL studio? What if a modernist tectonic roof plane was seen to be a system consisting of self-similar elements (rafters for instance) that could be described in terms of

¹⁰ See for instance Elizabeth Smith et al., *Case study houses: the complete CSH program 1945 – 1966* (Köln: Taschen, 2002).

variables – length, width, depth, material, colour and the like? Of course modernist tectonic parts were described in precisely this way.

What has become clearer in the time since is that the primary difference then between a parametric geometric/material system and a modernist tectonic geometric/material system is where the variation in the system lies. Variation in a parametric system tends to be located in the parts themselves, parts that are materially similar but formally different to one another. On the other hand, modernist tectonic parts tend to be flat, rectilinear and repetitive. Variation in this type of system doesn't lie in the parts, but in different qualities of relation between materially different, formally similar parts. This type of variation is less tangible, more ephemeral and experiential.

This was the first glimmer of a productively tensile relationship between the fields and even though it wasn't quite consciously realised at the time, it marked the beginning of an exploration of that relationship. My decision to select *Arts & Architecture* (synonymous as it is with the "Case Study House Program") wasn't an accident, but it certainly wasn't made with the attention to tension I have developed through this research. With the benefit of that attention, it would seem that I selected it to set up a tension between the new-ness of what I was doing in the AADRL studio with the old-ness of what I was doing in the AA library, as a means to ask questions of both through the making involved in each situation. For years I thought of this as a retreat to the known in the face of the unknown. What I see now is that my decision to choose *Arts & Architecture* wasn't out of fear of the new (parametricism) but out of curiosity for it, and a desire to test and develop the old (modernist tectonics) against the new and vice-versa.

The effect at the time was to shift my perspective on both fields. While as an undergraduate, modernist tectonics had been presented to me as compositions consisting of parts-in-fixed-hierarchical-relations, through the work it became clear that modernist tectonics might (rather) be understood as systems-in-contingent-relations. The central role of the architect in modernist tectonics as the 'composer' appeared exaggerated against parametricism where the architect, as the programmer of a system of material and inputs, stood aside as the system produced fluid, sinuous or grained forms. The work in the AADRL studio showed this image of the parametricist architect programmer to be just as much a myth as the modernist tectonic architect composer, in that the kinds of fluid forms and contiguous surfaces associated with parametricism weren't the result of an architect abstracted from their making. They required the same kind of hands-on care, skill and sensitivity (in digital and physical modes of making) as modernist tectonics did (Figure 18). The dual pursuit of two very different architectural fields set in tension with one another at the AADRL triggered something that continues to unfold. One outcome articulated through this research is the notion of the design project as an ecology with the architect as a particular kind of agent within it. Approaching and understanding design in this way borrows from modernist tectonics and from parametricism, but also differs substantially from both.

Another outcome was the reconsideration of where the principle tension in the work lies. That involved stepping back and looking at work as far back as my final year as an undergraduate through to the present. What became clear was that tension had emerged in the work early on. As set out at the beginning of the previous chapter, I developed a loose, messy drawing practice that involved drawing in charcoal on the back of rolls of surplus wallpaper in parallel to a precision modelling practice involving timber and concrete. What stood out about the models in the context of this most recent reflection was that the parts moved.

One model, the waka, was made from kauri and strips of jarrah¹¹ (figure 2.17). It consists of five sections that slide within a larger, four-sided frame. One end of the frame is removable such that the sections can be slid out and their order changed. Running across the width of the underside of the frame, partially rebated into it, are jarrah strips that are rounded in profile so that the whole thing rocks from side to side. But the waka wasn't the only model I made with this kind of emphasis on variability. At around the same time I made a model that set up cast concrete pieces as a structural frame. Hung from the frame were sliding partitions of polycarbonate that projected a largely reconfigurable interior space (figure 2.18). Further on, the Kinetetras prototype produced at the AADRL was fundamentally about being able to vary form and space according to changing data inputs according to programmatic needs (figure 2.19). The same desire for reconfigurable space is evident at Langs in the sliding doors and the sliding cabinet between the living spaces (figure 2.20).

From the waka, through the AADRL to Langs, the work shows a will to compositional variability and dynamism. These are qualities that are readily experienced in the design project ecology where the agents, relations and interactions are fluid, but that are problematic to establish as qualities of compositional relation between fixed parts that are (mostly) flat and (mostly) fixed in relation to one another. The principal tension in the work of Ark lies not between the formal characteristics of parametricism versus modernist tectonics, but between more fundamental compositional ideas that are associated with each – the dynamism and process associated with parametricism and the relational fixity associated with modernist tectonics. The goal then is to create variable, dynamic compositions from fixed parts in fixed relations. Through the qualities of relation that are established between the parts that sense of dynamism is achieved in the compositional outcome.

¹¹ In brief, waka huia are vessels that contain one's most precious possessions. My waka was empty but for the cuts that articulated the interior surfaces. They recorded a story of the matrilineal line by which I find myself in New Zealand.

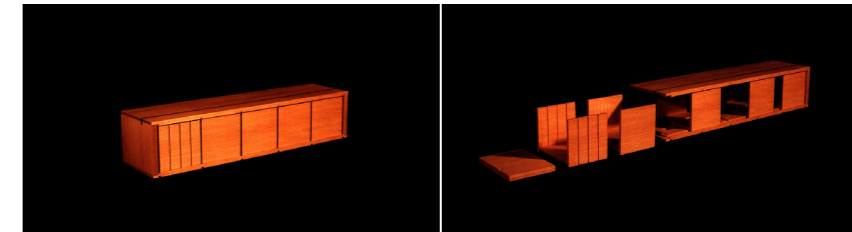


figure 2.17: waka huia (1994)
photography: Mark Klever

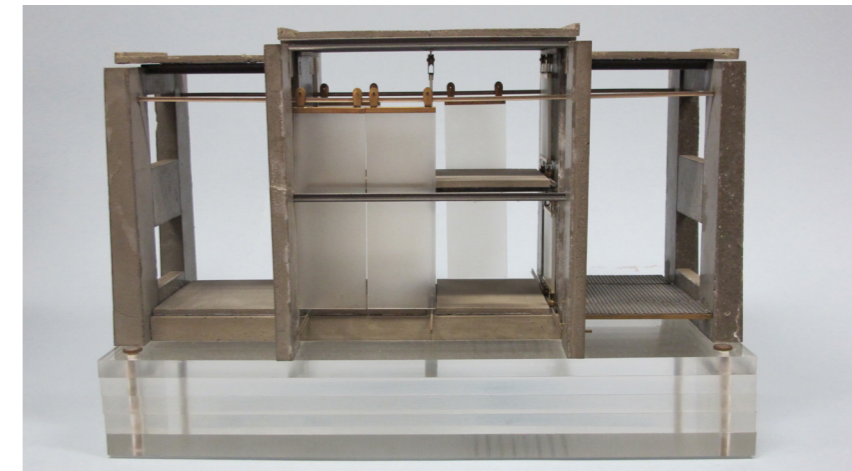


figure 2.18: Sade model (1994)
photography: Sajeew Ruthramoorthy



figure 2.19: Testing Kinetetras (2002)
photography: Anat Stern

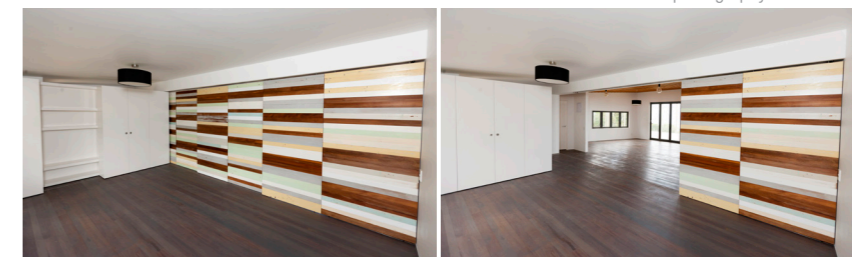


figure 2.20: sliding cabinet and sliding doors at Langs bach (2012)
photography: Sajeew Ruthramoorthy

PROVISIONALITY

The provisional compositional taxonomy

Chapter 3



While the discussion of tension in the previous chapter ended by problematizing the issue of compositional fixity in one way, the discussion of provisionality in this chapter problematizes it in another.

Hints as to the persistent presence of the quality that came to be known as 'provisionality' first came to light in a series of physical models that included the phase one model for the Langs Bach project. As the design for Langs developed this quality became increasingly apparent. It tried on various names in discussions, written records and reflections on the project before 'provisionality' was found to fit. It was drawn to the fore as an issue for investigation through the first draft of the compositional taxonomy. What began as a means to see provisionality (among other things), became the principal means to demonstrate the idea as the taxonomy itself proved to be provisional. In doing so it called into question the nature of composition more generally.

Something referred to as being 'provisional' usually means that it is serving a purpose in the meantime, it is temporary. Here the idea of the provisional has come to encompass notions of agents being suspended in temporary, contingent relations with one another in readiness to adapt in response to changes as they occur the design project ecology. Provisionality is a quality that emerges in the project that reflects the propensity of the ecology to change and adapt. It is present in the design process as much as in the compositional outcome and the research demonstrates Ark's concern for working with it productively.

The text that follows is divided into two parts. Part A provides a short account of how provisionality was observed in the models. It leads into an account of how provisionality was seen in the Langs Bach project as a quality of design process and compositional outcome. Part B provides an expanded discussion of the compositional taxonomy. It explores the compositional tendencies revealed through the taxonomy and the compositional condition they constitute. It looks at the effects of the taxonomy on the research, and in turn, how the taxonomy continues to develop to account for the compositional peculiarities that each new project brings. In doing so it demonstrates that while the taxonomy itself is provisional, it is stable and accurate enough to provide a useful lens through which to understand the compositional tendencies and the overall compositional condition they constitute as it operates in Ark's work.

PART A: Drawing out provisionality

At the May 2010 PRS, when I presented my models to the panel, the discussion went beyond a general discussion of composition (which is where I left this account in the previous chapter). It ran through to more pointed attempts to articulate the quality of composition that was seen to be common across them. One reviewer described them as being 'crafty' in that, while they were well-crafted, there was an efficacy evident in the modelling that combined with a tendency toward juxtaposing materials to cut across the earnestness of the craft. Another described them as being 'performative' in that they carried in them some sense of the performance of their making. He went on to comment that, while the parts operated in clear hierarchies with one another, they did so uncomfortably. The discussion progressed with the idea that the discomfort presented most clearly in the collage quality of certain models, but at the same time, that the particular collage quality demonstrated a sense of humour that mitigated the discomfort and in some way made it compelling.

Particular focus fell on the collage quality of the phase one model for the Langs Bach with the over-scaled red flax, the lime green foam, and the faux, super-green grass butting up against each other. Something similar happened between the bamboo skewer trees and the blue kitchen sponge hedges, and with the white plastic tourist-with-camera and woman-in-kimono set against the plywood walls (figure 3.1). Each was a very precise element with a particular material quality. When the elements were juxtaposed the whole simultaneously projected a sense of precision (as a firm statement of intent) and yet a sense of openness to change that eventually came to be seen as being typical of provisionality.

As the discussion of this compositional quality was unfolding between the panellists, evidence of the drawing process that had led to the Langs model sat alongside it but didn't attract a great deal of attention. However, as I packed up, after the words 'performative', 'crafty', 'hierarchy', 'composition' and others had been used to describe the model, it struck



figure 3.1: Langs bach, phase one model
photography: Sajeew Ruthramoorthy

me that these properties were also present in the drawing process that had led to it. The process operated by making in different mediums and bringing them into relation with each other for short periods of time. Somehow the quality of the design process was reflected in the compositional outcome in that both the making practices and the model parts seemed to be held-in-suspense with one another, and that they and their relations were liable to change. The tension in the relations between the parts led to that sense of suspension.

This quality persisted into the built outcome to become the quality that defined the Langs Bach project. While it is an overall sense that builds through the tensile compositional relations between the parts, that sense is punctuated at a particular point in the space where the entry ends and the living space begins (figure 3.2). The delineation between the living spaces in the built outcome at Langs is established by a 140 millimetre step up from the adult's space into the kid's space. The six timber doors run along the edge of the step, which is paralleled by a bulkhead above that holds the track from which the doors are hung. Perpendicular to the doors is a cabinet that separates the entry space from the remainder of the kid's space. It slides apart to lengthen the entry space, focusing movement through the entry into the adult's space and simultaneously closing the corner of the kid's space to reveal the A/V gear within. The cabinet corresponds to the height of the doors but is open above. It slides along the floor to butt into the face of the first door, just creeping under the bulkhead to do so. The cabinet took on the same white of the plasterboard-lined walls, but in a low gloss lacquer rather than a matt. Inside the kids' space the cabinet operates in tension with the existing paint colours of the recycled rimu match-lining to the sliding doors: stripes of peppermint green, French vanilla cream, matt grey, muted turquoise blue, and flaking white (figure 3.3). Inside the same space the recycled rimu timber flooring is juxtaposed with the clean white of the walls and the cabinet. Other juxtapositions play out between the old material (the flooring and the doors complete with nail strike) and the new (the cabinet and the walls). The sense of the provisional that results from these aggregating tensile relations pervades the space and speaks of its intention to change. That sense is underlined by the doors and the cabinet which move to reconfigure the space and relations between the parts.

The process of designing and making the doors bore a similar quality in terms of a capacity to sustain change as the project developed. The doors appeared as elements at the outset of the drawing process as lines in sketches and then in the first AutoCad plan drawings. In the phase one model they became two sets of two 2.4 metre high by 3.6 metre wide exterior, slat timber shutters highlighted in zebrano print. In the built outcome they became six, 2.1 metre high by 1.0 metre wide interior hollow-core doors, each faced on both sides with 12 millimetre recycled rimu match-lining, and with a CNC relief milled into one of those. By maintaining a certain provisionality to the nature of the element it was able to respond and adapt specifically in response to shifts in client preference, encounters with technical constraints, and the gradual revelation of the availability and type of timber salvaged from the old house.

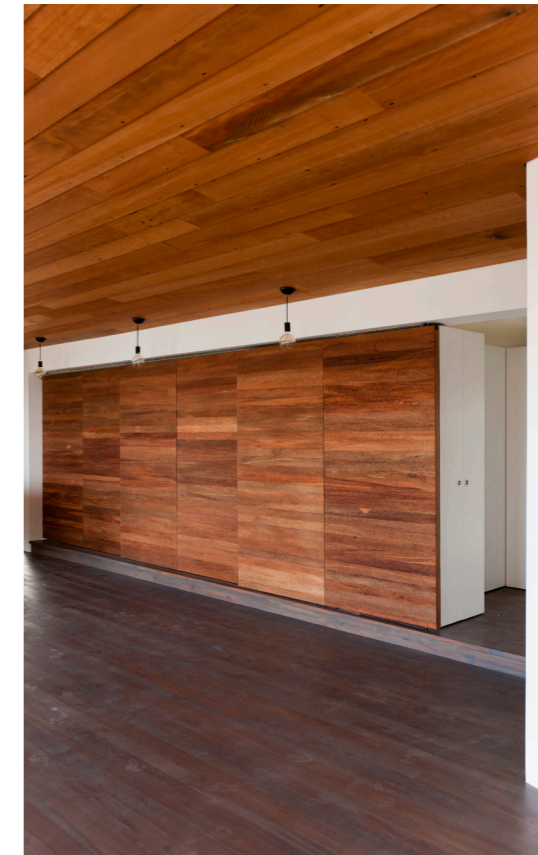


figure 3.2: entry space at Langs bach
photography: Sajeev Ruthramoorthy



figure 3.3: parts in relation in the childrens space at Langs
photography: Sajeev Ruthramoorthy

As I drafted initial reflective accounts of Langs it became clear that this quality appeared in each of these different aspects of the project. But it didn't have a name. In conversations around it, the phrase that had come closest to capturing it was a 'sense-of-the-provisional'. Through the writing it eventually became 'provisionality'. Giving it a name had the effect of bringing it to the fore and my attention to provisionality grew. With that so too did a sense that this wasn't a quality that was confined to one project, but a quality of process (as much as outcome) that had developed in relation to similar experiences over a period of time.

Langs absorbed information from a range of agents that included my own internal machinations, client vacillations, miscommunications, economic bumps and the idiosyncrasies of authorities. But none of the impacts of these agents were out of the ordinary, they were as I had encountered them in the past. On the back of the experience of Langs, and the protracted engagement with the sliding doors in particular, in one of the draft reflective accounts I wrote a form of proposition:

"A conceptually rigid composition consisting of parts conceptually fixed in relation to one another, all held tightly together by the architect with fixed ideas of what must be, will tend to struggle inside the design project ecology. This is because change is inevitable, and each change propels ripples through the ecology with the impetus to create further change. Maintaining a conceptually rigid composition in the face of constant change might well absorb a great deal of a designers' energy and ultimately lead to a lot of disappointment.

What if architectural composition was instead conceived of as consisting of provisional parts in provisional relations? Might such a composition be able to adapt to changing circumstances in a way that allows it to responsively navigate the flux of the design process? With such an approach, design might be less about producing compositions that are so perfect or so compelling that they resist change, and become more about developing adaptable compositions that are able to sustain change."

The discussion of tension in the previous chapter problematized the issue of compositional fixity in terms of achieving dynamic qualities of compositional outcome. The proposition above re-problematized compositional fixity in terms of a quality of approach to composition, one that was non-fixed and adaptable. It also indicated how significant I felt the idea of provisionality was to Ark as a practice, but I needed a means to test that hunch.

PART B: The compositional taxonomy

The compositional taxonomy became the principal means to understand provisionality. It was a design project in itself that took the form of a drawn, post-design reflection upon the Langs Bach, Albany house and Ecotech projects. It was intended a lens through which to articulate the individual compositional tendencies that were suspected of inhabiting the work. Initially the taxonomy drew the tendencies into a sort of compositional formula. But when the taxonomy was extended to include the Haast Street and Lab projects, the constituency of the compositional formula was seen to shift to account for the compositional peculiarities of each of the new projects meaning that it wasn't as formulaic as first thought.

Drawing out compositional tendencies / constructing the compositional taxonomy

An initial written reflection on the Langs Bach project in terms of the compositional outcome was followed by similarly focused reflections on the Albany house and Ecotech projects. Through the writing process a strong sense bubbled to the surface that there were compositional tendencies (including provisionality) inhabiting the work, but I had no way of seeing them. Fresh in the frame from making my 'field of practice' diagram was *Phylogenesis: FOA's Ark*.¹ I grabbed the project taxonomy from the book as a model for an Ark taxonomy. While FOA's taxonomy demonstrated the evolution of each project from a common source to a distinct formal system which they describe as a species, Ark's taxonomy came to demonstrate a concern for certain types of compositional part in particular qualities of relation. It brought two different modes of reflection – writing and drawing – together in a loop that iteratively developed the terms of the research and allowed the discussions of the work to unfold. The first version of the taxonomy reflected only on the Langs Bach, Albany house and Ecotech projects. It consisted only of exploded isometric line drawings of the projects that showed each part in each project. Beside them were set photos of the parts in-situ in the completed project (or sections and renders in the case of Ecotech). Together, the written and drawn aspects of the taxonomy revealed a number of compositional tendencies in the work.

Compositional parts and relations

The same six, dissimilar types of part appeared in each project. If the projects were thought of as episodes in a play, the parts played a similar compositional role in each even though they took on different specific forms. Their characteristics developed in relation to the specificities of each project. The parts came to be known as the diagrammatic volume, constructed space, articulated plane, mannered skin, operative backdrop, and the variable.

¹ Foreign Office Architects, *Phylogenesis: FOA's Ark* (Barcelona: Actar, 2003).

Despite the parts finding different specific form in each project, the same three qualities were experienced in the relations between them. They were named 'tension', 'provisionality' and 'poise'. They were found to be nested one within the other where qualities of tension laid down the conditions for provisionality which laid down conditions for moments of poise. While they were noted through the taxonomy they weren't recorded in the taxonomy drawings in the first instance, but found form eventually in red notation that was laid over photos of the parts.

The parts and qualities are defined and discussed in detail in the "prelude" in *Ark: A Provisional Compositional Taxonomy* and so won't be repeated here. But it is important to note that the six parts weren't all always known by the names they bear above and, while the names of the qualities didn't change, the types of quality their names represented did develop with the taxonomy. These are separate topics of discussion that will be picked up in due course here as a means of showing the shifts the taxonomy went through as it developed.

Material difference and independence

With the parts and relations outlined, through an odd form of reflection, tendencies in the work toward materially differentiated, independent parts were eventually seen operating in the detail of the relations between the parts. In each project there are aspects that, while they make it through developed design or even into construction documentation, don't find their way into the built outcome. Those at Langs and Albany haunted me. I wished that the buildings had been realised as intended. That they weren't irritated me deeply. These unrealised design intentions are referred to here as 'discrepancies'. Their importance in terms of understanding the compositional tendencies is that the irritation I felt in relation to them indicated what was important by what I missed when it wasn't there. Another column was developed for the drawn taxonomy that specifically highlighted the discrepancies in the Langs Bach and Albany projects. Set between the drawings and the photos, it initially consisted of red key-lines and white 'does-not-equal' symbols that indicated where and what the discrepancy was. Details that were intended but not built were also included to further explicate the particular discrepancy.

To expand on the discrepancies and irritations in terms of the insight they provided, the previous chapter outlined how, late in the Langs design process, at the request of the client, the cladding was changed from a white polycarbonate to a dark-stained timber board and batten (figure 3.4). While the irritation with that change remains, the taxonomy afforded an understanding of that irritation as being the result of the change effecting a collapse of the material difference between the parts. Material difference was important! As the writing and drawing went on it became clear that material difference between the parts was important because it was the means not only of distinguishing the parts but of setting up tensions between them. So it appeared that tension was something that I had actually sought to establish in the Langs composition.

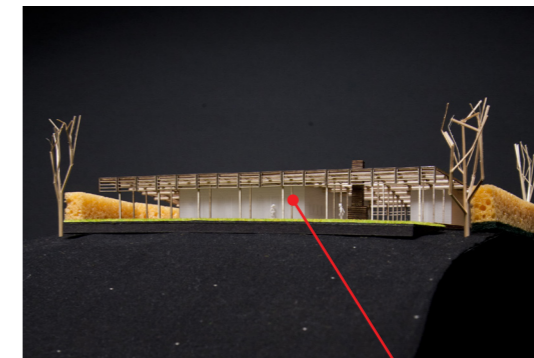


figure 3.4: discrepancy in the mannered skin at the Langs bach
photography: Sajeev Ruthramoorthy

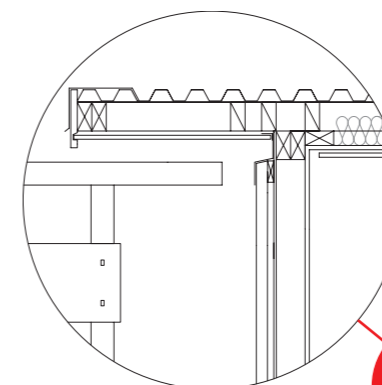


figure 3.5: pergola-to-cladding
detail discrepancy at Langs bach
photography: Sajeev Ruthramoorthy

As the irritation wore on me I found that it wasn't just to do with the collapsed material difference between the cladding and deck-pergola, it was also to do with the cladding itself. There was a new-ness that the polycarbonate brought in the form of opportunities to explore its potential to cast shadow, to allow light to pass through while obscuring the gaze, to be lit from within and for the building volumes to glow. With its new-ness it was also an unfamiliar, slightly alien material that was set to be more so in the presence of the familiarity of the timber deck / pergola. That property of (relative) unfamiliarity would have forced a level of design consideration into how to accommodate windows, doors, sheet flashings, taps, and outdoor shower heads with an urgency that the familiarity of the board and batten did not. The polycarbonate cladding would probably have resulted in a clearer articulation of the walls as a compositional part, and would likely have enabled it to play the compositional counter-part to the deck-pergola more effectively than the board and batten. The lesson in this was that a level of unfamiliarity of (and between) the parts was also useful in articulating tense relations between them.

Leading into detailed design at Langs the pergola had been designed to be held apart from the cladding – the detail kept them close to one another but physically unconnected (Figure 3.5). But I waivered as the questions from the engineer, the draughtsman and others flew in. Without the understanding (that the taxonomy brought) that I was actually seeking to set up tension in the composition, let alone a clear idea of how to do so, I couldn't articulate my position and ultimately went against a deeper sense that they should be held apart somehow.

Through the lens of the taxonomy, the 'as built' connection of the pergola to the cladding blurs the boundaries between the parts and thus their relation. In bringing them into physical contact something was lost – the quality of tension in the relation between the parts largely collapsed. Again, through the writing and the drawing it became clear that both tension and provisionality were supported by a level of independence between the parts. That independence was established in the work by physically holding the parts apart. But where the parts actually needed to be joined, the appearance of the parts being held apart was provided through some sort of negative detail.

Negative details play a prominent role in the work. The designed but not implemented separation of the pergola from the cladding at Langs referred to above is one example. Others include that designed to take the canopies at the Albany house; the space between the factory and the tenancies at Ecotech; and that between the the cabinets and the walls at Haast Street.² Joins between parts tend to be either concealed or drawn back from the 'faces' of the parts concerned. The outcome is a focus on the relation between parts, and a mitigated risk of potentially distracting, awkward 'positive' details.

Other discrepancies in the Langs project included leaving the vertical elements off the end of each pergola rafter which impacted the articulated plane (figure 3.6) and leaving out the external fireplace which impacted the constructed space (figure 3.7).

² This emphasis on the negative detail is a particular kind of connection the work has to modernist tectonics.

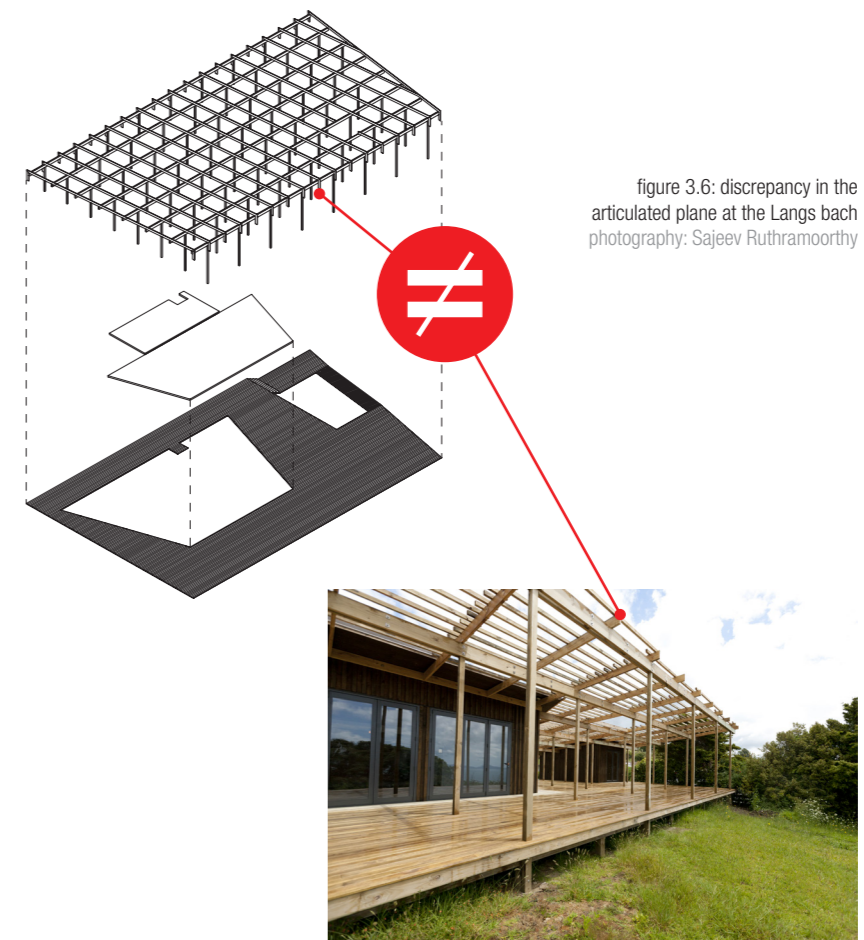


figure 3.6: discrepancy in the articulated plane at the Langs bach
photography: Sajeev Ruthramoorthy

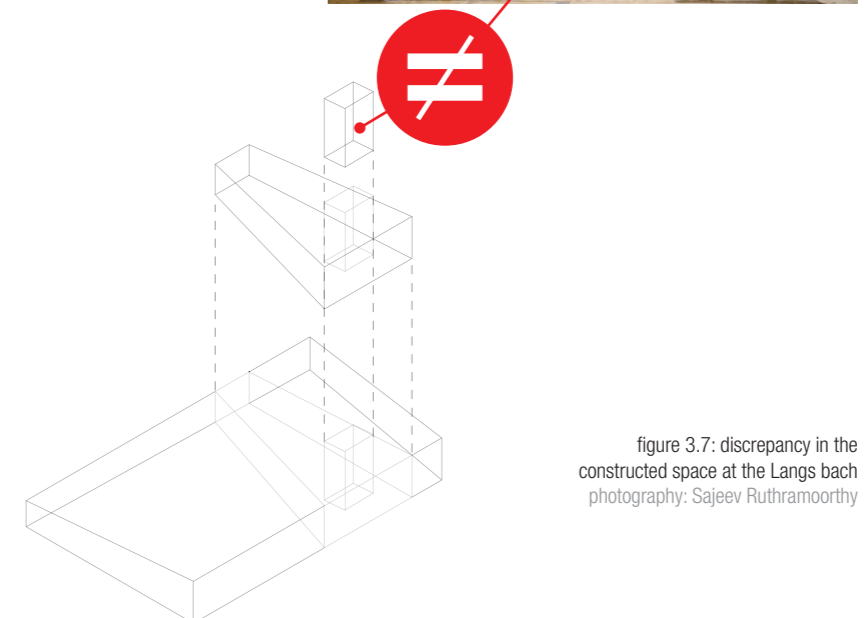


figure 3.7: discrepancy in the constructed space at the Langs bach
photography: Sajeev Ruthramoorthy

These were significant omissions but, given that, what was surprising was the relative lack of irritation that accompanied them. This was reasoned as being a result of the changes to the being largely limited to the parts themselves. The changes didn't have direct or significant impact on the qualities of relation between the parts because they were made to aspects of the parts that were not physically connected or in close proximity to other parts. So the parts weren't so precious, they could change under certain conditions. But the qualities of relation between the parts were held to be more of a concern.

The leaving off of the retractable canopies at the Albany house illustrated this idea in a different way (figure 3.8). The design sought a type of spatial dynamic that was to be provided by shifts in the ceiling to the living room as it rose and fell between the two bedrooms and bathroom in the bridge above (figure 3.9). When that aspect was all but lost through the insertion of a third bedroom into the bridge, the only parts to bring any sort of dynamism to the project were the retractable canopies (the variables) that were to extend and reorient the living space to the East and West when required. But the canopies were left off. The resulting overall sense of the project is that, while certain tensions play out, and while it demonstrates a particular type of poise at particular moments, the project misses the dynamism that the provisionality of the canopies would have provided.

Questions of agency

The first draft of the taxonomy was met by supervisors and colleagues with both excitement and a level of trepidation. While it made certain aspects of the work explicit, through identifying and naming the compositional tendencies it seemed to have cast them into fixed roles in a formula. It felt a bit contrived but this shouldn't have come as a surprise. The taxonomy began as a set of ideas extracted from three projects in retrospect. As set out in the discussion of research method in the introduction, they were articulated through an approach to written analysis that had been developed in relation to the work of another practice (Crosson, Clark, Carnachan Architects) and a form of drawn analysis taken from the work of another (FOA's taxonomy in Phylogenesis). The taxonomy would undoubtedly have agency in relation to the research as it was unfolding and the fixity it projected gave cause for concern. Might it actually cage the underlying compositional tendencies it set out to articulate and mobilise? How would it impact the design of new projects? As these questions of the agency of the taxonomy were forming, renovations at my own house were nearing completion.

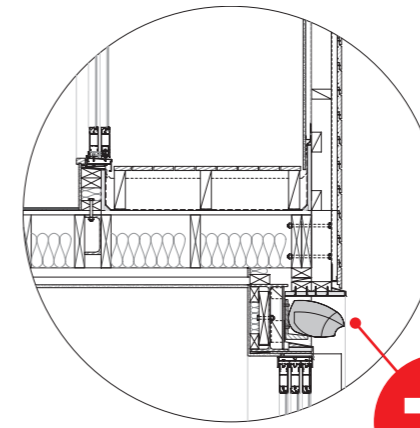


figure 3.8: discrepancy in the variable at the Albany house
photography: Simon Devitt

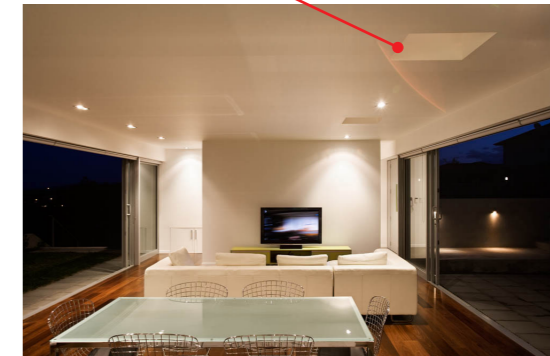
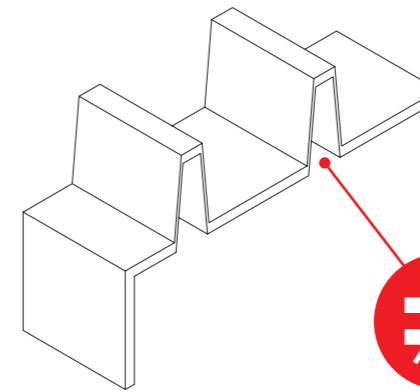


figure 3.9: discrepancy in the operative backdrop at the Albany house
photography: Simon Devitt

Developing the taxonomy: Haast Street and a different type of reflection

The written aspect of the first draft of the taxonomy that reflected on Albany, Ecotech and Langs was produced in parallel to the design of Haast Street. The drawn aspect was produced in parallel to its construction. In other words, Haast Street developed in parallel to the mechanism through which it was reflected. This was a different type of reflection, one with short enough periods between action and reflection to influence both the project and the taxonomy as they were being brought into being.

Haast Street was an alteration to my own house, a 1930's timber bungalow that I share with Vanessa, lyla and Noah (my wife, daughter and son). It is a built project that reconfigures three rooms: a dining room, kitchen and family room. Insensitive alterations in the early 1980's had introduced awkward details into the bungalow that interfered with its material and spatial composition: an odd bulkhead; an exposed, crooked, rough-sawn timber beam; small jinks in walls; and an odd kitchen to name a few (figure 3.10). The aim that emerged in the design process was not to fix them through any sort of restoration, but to seize them as points of departure, to extrapolate them into a new set of compositional elements that might overlay and find some sort of relationship with the old bungalow composition. As it turned out it wasn't a matter of implementing the formula that the taxonomy might have been seen to prescribe. Rather, there were just little 'ah-ha!' moments after they had been designed when I realised in reflection what had become of the details in the terms of the taxonomy.

The initial bulkhead running over the library and between the dining room and kitchen was a case in point (figure 3.11). The design introduced two others. In repeating the bulkhead, it ceased being yet another ill-fitting, distracting element. Three of the same type of element, articulated similarly in form and colour so that they would be read collectively, afforded the bulkhead a presence and a role in the composition. A week or so after they had been designed, in looking at the project through the lens of the taxonomy, I saw they were each instances of the articulated plane.

The cabinets offer another example. As they were being made, I wondered why I found their road-marking yellow interiors behind the white melamine-faced plywood doors so compelling. In the light of the taxonomy I saw them as a type of variable. They introduced a dynamic interplay between the more normative white cabinetwork and its somewhat unexpected (relatively ridiculous) interior colour. In-situ, when a cabinet door was opened, surprise met with humour to overturn the seriousness of the composition so carefully set up between the parts. The layers of tension between the parts in the composition began with that between the white cabinets and the matai floor. The resulting provisionality of the whole was punctuated by the upset introduced by opening the cabinets. But in reflecting on this particular aspect the idea of provisionality became more detailed and more complicated.

For instance, while Haast Street underlined the relation between the variable and provisionality seen in the taxonomy to date, another level of detail was added to that relation. Provisionality here wasn't so much punctuated by spatial reconfiguration (as it was seen to be in the Langs and Albany projects) but more by a change in spatial quality. This small shift gave a sense of the larger impact of drawing Haast Street into the taxonomy. It became fuller, more robust and gave a deeper feeling of the compositional tendencies it was striving to describe. But with its affirmation in this way, concern increased over the agency of the taxonomy in relation to projects to come.



figure 3.10: Initial kitchen with dining room beyond at Haast Street (2007)
photography: Vanessa Ceelen



figure 3.11: Current Haast Street dining room with kitchen and family room beyond (2012)
photography: author

Testing the taxonomy: The Lab

The Lab, an exhibition at the 5th Auckland Art Triennial, became the first test of the taxonomy in a 'finished' state, with all the terms, parts and relations defined. The Lab accommodated five successive architectural/academic practitioners operating on 'live' projects, each for three weeks at a time inside the Chartwell Gallery at the Auckland Art Gallery. Ark produced an adaptable context for this range of as-yet-unseen works to play out in relation to. It consisted of a number of parts that were intended to be moved in relation to one another to accommodate the differing requirements of each exhibitor as their work unfolded. The whole project was provisional.

While the question of the agency of the taxonomy was carried into the project, it wasn't foregrounded as there simply wasn't time, nor was there the will to do so – I didn't want to force the issue, I just wanted to see what would happen. So while the project vehicle of the Lab was pursued, the academic project of examining the agency of the taxonomy tracked along in parallel (but) to the side.

The project began with a survey of ready-made, surplus objects and materials held by the Gallery and others. The design for the Lab formed in response to that survey and the surplus became the parts. The parts weren't 'assigned' roles in the compositional taxonomy. It was only in reflecting upon the project that I realized what part had taken on what role. The constructed space, the articulated plane, the mannered skin, the operative backdrop, and the variable are roles that parts seemed to take on as they emerged in the design process. Similarly, how tension, provisionality and poise played out in the project was only understood in reflection. While the taxonomy had a relationship to the project it was not determinative of it. Reflecting on the Lab through the taxonomy instead suggested the opposite, that the Lab challenged and shifted the taxonomy. A discussion of that shift follows below through accounts of the different parts and qualities of relation that were shifted.

Parts shifted through the Lab

The articulated plane prior to the Lab was known as the 'folded plane'. Only it wasn't so much folded as it was flat at the Lab. It found form in the blue, orange and deep red coloured carpets that were rolled out and juxtaposed against the bleached-white, exposed aggregate concrete of the Gallery floor (figure 3.12). This recalled Langs where the intended folded plane of the pergola fulfilled its compositional role despite the absence of the fold in the built outcome. This suggested that the thing which distinguished the plane was more complex than the formal move of a fold. At the Lab, as with the built outcome at Langs, material, colour and texture replaced the fold as the means of articulating the plane. The name of the part fell into question and was subsequently changed to the 'articulated plane'.

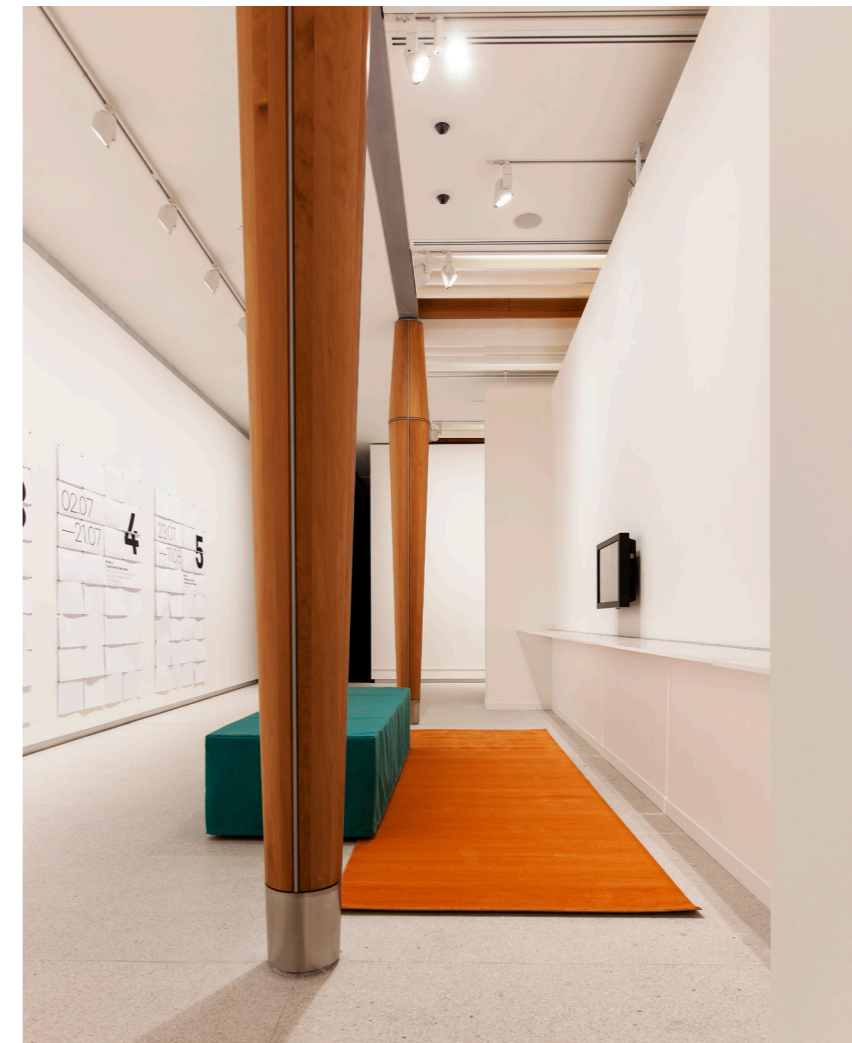


figure 3.12: Library at the Lab at the 5th Auckland Art Triennial
photography: Lucas Doolan

The part originally known as the 'interstitial space', then as the 'excavated space' was renamed the 'constructed space' after the experience of the Lab. One hundred empty, old gallery frames were hung from aluminium channels suspended on rods fixed to the ceiling of the Gallery. Initially the frames were set out evenly along 4 parallel lines (figure 3.13). The lower edges of the frames defined a datum at about head-height. Above the datum was a kind of thick, material space occupied by the frames and the exhibition content they displayed. The invitation to each exhibitor was to excavate from this thick space by shifting the frames into groups, overlapping them, and hanging them off one another according to the demands of the work to be exhibited. The expected effect was that space would be created by 'excavating' from the material space the frames defined (similar to the space framed between the building volumes at Langs, and the spaces cored out of the Albany and Ecotech projects). Instead, shifting the frames had the opposite effect. Space was defined by where the frames were present rather than by where they were absent. The space wasn't so much excavated by the removal of frames as it was constructed by their presence (figure 3.14).

More than nomenclature, the Lab threw the idea of the variable as a part into question. At Langs and at Haast Street there were fixed parts in relations that produced a sense-of-the-provisional and the variable punctuated that sense – the fixed parts effectively formed a stage for the variable as a character to play out on. The Lab was different. Provisionality there Lab wasn't due to a careful composition of fixed parts but due to the fact that everything other than operative backdrop of the gallery walls actually did move and every relation actually was provisional. A strict reading of this situation through the lens of the taxonomy as it stood at the time would have made it clear that there was no variable in the project. However, in effect, the role of the variable had been distributed across the carpets, bleachers, crates and particularly the frames – the articulated plane, mannered skin and constructed space. In doing so the effect of the variable was magnified and altered – there were so many characters and they were the stage. But they weren't there to punctuate, they were there to be with each other (for the time being).

If the taxonomy had been used as a formula that was determinative of the design of the Lab, or if it had led the project, the distribution of the role of one part across other parts would not have been fathomable, let alone the magnification and alteration of its effect. But this was clearly not the case and the apparent schism was indicative of something deeper going on where the categorization that the taxonomy seemingly cast over parts and qualities failed. With that failure there was a pronounced distinction between the compositional taxonomy and the compositional tendencies that the taxonomy sought to describe. It produced a feeling that the tendencies were shifting with the projects and that the effect of the taxonomy was facilitate the evolution of those tendencies. That feeling informed a further reconsideration of tension, provisionality and poise and how they had evolved through the taxonomy.

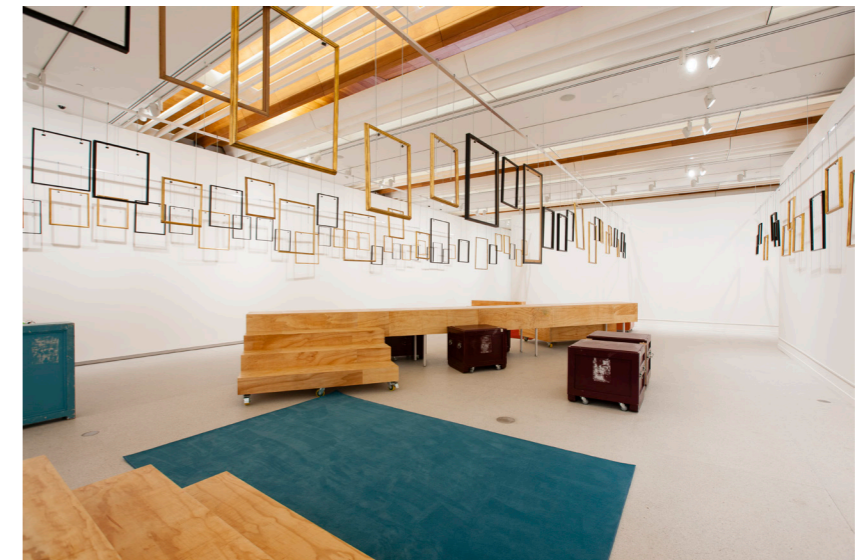


figure 3.13: initial configuration of the Lab
photography: Lucas Doolan



figure 3.14: Lab with frames shifted and spaces defined
photography: Lucas Doolan

Qualities evolved through the compositional taxonomy

While the term 'tension' didn't change from the first draft of the compositional analysis, subsequent reflection on the work through the compositional taxonomy shows that the nature of the compositional relations the term was used to describe did develop. The definition of tension presented in the first draft of the taxonomy emphasized that it occurred between two parties rather than between a number, and that for tension to occur the parties needed to be appropriately proximate to one another – not too far away, not too close; both similar and different – not too similar, not too different; there needed to be some degree of attraction or repulsion between them – not too attractive to one another and not to repellent. It was pointed out on the back of the Lab that the work seemed to have outgrown this definition.

Major tensions in the Albany, Ecotech and Langs projects existed between materially differentiated parts that were stacked over one another: The timber bridge over the concrete base at Albany, the timber volumes over the green wall at Ecotech and the polycarbonate cladding set in relation to the timber of the deck and pergola at Langs were all two-part tensions. At Haast Street however, tension existed between multiple parts that were differentiated primarily in terms of age and detail. The tensions lay between new white cabinets, the old white walls, new black rippled tiles and old matai floor boards. At the Lab, while a base tension lay between the long table made from the used studio table tops and the pristine, white gallery walls, others played out between the carpets, the gallery floor, the crates and the frames. At Haast Street and at the Lab tension clearly played out between multiple parts.

Haast Street offered another lesson in tension in that there they didn't all play out through juxtaposed, highly-materially-differentiated parts. The composition at Haast Street relied in large part on the subtle tension between the old, matt-white plasterboard walls with their proud skirtings, scotias and architraves, and the new white cabinets with smoother, finer texture and negative details (figure 3.15). This realisation sent another series of ripples of reconsideration through the taxonomy regarding what had been considered to count as tension in the work. Other more subtle tensions began to show up in other projects.

Similar to Haast Street, there was a subtle tension between the sliding cabinet and the walls at Langs (figure 3.16). In contrast, setting the standalone stainless steel kitchen cabinets against the walls at Langs didn't produce tension – it was just slightly odd despite contributing to the overall provisionality of the project (figures 3.17 & 3.18). Tension wasn't set up by just about putting two different things beside one another. There needed to be some consideration given to how the parts were to be held together compositionally so they could pull in different directions. The importance of the negative detail between parts was again highlighted in terms of setting tension up, and the relative proportions, alignment, and the space between parts were all shown to play a role.



figure 3.15: cabinet to wall detail at Haast Street
photography: author



figure 3.16: children's space at Langs
photography: Sajeev Ruthramoorthy



figure 3.17:
kitchen cabinets in relation
to the white walls at Langs
photo: Sajeev Ruthramoorthy



figure 3.18:
kitchen cabinets in relation
to the white walls at Langs
photo: Sajeev Ruthramoorthy

While this reconsideration was worked into the detail of how tension was set up, taking it back to the taxonomy resulted in a feeling that the idea of tension was also expanding. It was becoming more a category that encompassed a broader set of similar kinds of relations including 'contrast', 'juxtaposition', 'comparison', 'association' and the like. All of these had been used leading up to the introduction of the idea of tension, but all had been forgone in favour of the one word. Now it seemed, as the idea of tension was being further articulated, that these words were becoming useful again. They weren't a distraction from the central idea, but words that gave a fuller sense of the intended meaning of the term 'tension'.

Whether tensions appear subtly or in a more forthright manner is a matter impacted upon by a broad range of agents as another observation from the Lab illustrated. The experience of the tension between the long table and the white gallery walls differed with the position of the table in the space in a way that suggested that the social propriety of the gallery may have also played a part in the quality of tension between the two (figures 3.19 & 3.20). With that, tension took on a social dimension that the taxonomy provided a window onto but couldn't account for. That same observation at the Lab led to a reconsideration of the diagrammatic volume as a part. Even though it was acknowledged as a key starting point for the design process, it had originally been considered to be a relatively neutral diagram consisting of data related to site, brief, budget and the like. In recognising the social dimension to the tension in the Lab, the diagrammatic volume became much more a diagram of predispositions that were otherwise implicit within the project.

Revisiting provisionality through the Lab threw new light onto the topic of material reuse in the projects. Bringing in old table tops, crates and frames was initially argued as a way to meet the pressing budget and time constraints of the Lab project. At Langs the reuse of the mirrors, the reuse of the rimu framing in the flooring, and the pastel coloured match-lining on the doors was argued as a way to bring meaning into the project for the Client. At Haast Street bringing old material into contact with the new appeared inevitable. But in each case the composition highlights the idea that the parts belong to different times, and in a way that suggests that their relation might be temporary and provisional. Rather than material reuse being argued in terms of the given conditions of each project, the taxonomy offered a way to see this as a tactic that had developed from Langs, through Haast Street to present strongly in the Lab. Bringing old materials into relation with new was a means by which provisionality was introduced to the projects.

Poise was also revisited on the back of the Lab in an effort to articulate how it had developed through the taxonomy. Ecotech presented only a single moment of poise. It lay in the space of tension between factory operations and the multiplicity of agents that constitute the city beyond (figure 3.21). On the other hand, Albany's protocol of approach consisted of five discrete moments of poise (figure 3.22). Each framed the visitor, the visited and the house in a slightly different way to celebrate arrival and to reinforce the roles of visitor and visited. But the moments themselves were simple. The bulk of the house at Albany obscured the



figure 3.19: long table against the wall at the Lab
photography: Amy Yalland (Index)

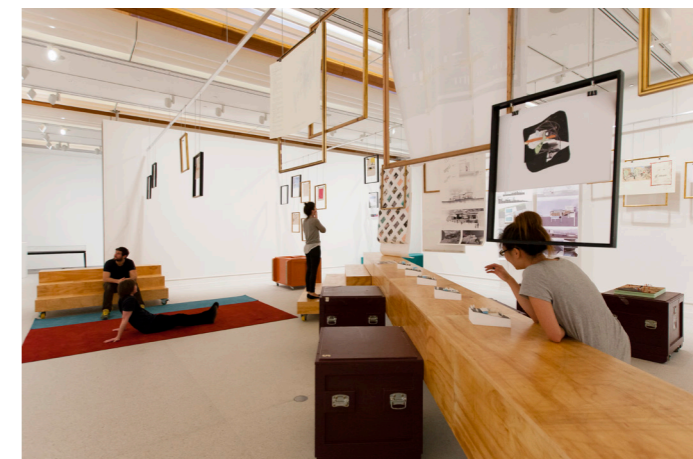


figure 3.20: long table on the diagonal at the Lab
photography: Lucas Doolan

background and the descent into the courtyard further reduced the potential for distraction. In this way focus was brought to the immediate issue of the step by step approach to the building.

Langs consisted of four moments poise and while the first three were similar to those at Albany – they framed views and celebrated arrival – the fourth was something different (figure 3.23). It did something similar to Ecotech in that it was the place where all sorts of parts and relations were brought together in a frame that was itself shifting.

Haast Street presented two types of poise (figure 3.24): One at the threshold between the dining room and kitchen which is similar to those at Albany. The other, when the kitchen cabinets were opened and the road marking yellow of the interior was exposed, upset the carefully constructed earnestness of the composition. This was a different type of poise.

In retrospect, as I completed the first draft of the taxonomy, even though I had collected at least three different types of poise, the narrow definition of poise that I was holding onto could really only account for the discrete type that appeared at Albany. The Lab prised that initial definition open. It featured two types of poise. The single, discrete moment at the spatially well-defined threshold to the exhibition space was very much a place to see and be seen as at Albany (figure 3.25). The other type was very different. It occurred at points throughout the gallery at the diffuse thresholds of the spaces defined by the groups of hanging frames. It resulted in a dynamic field of fluctuating spatial intensities that stretched throughout the gallery. While these two types of poise were in close proximity to another, my attention was drawn more and more to the dynamic type rather than the discrete type. This illustrated how much the term had developed through the work. It had moved from being an experience set up by fixed elements at a fixed point in space, through a series of moments that defined a protocol of approach, to being something far more dynamic that occurred when a raft of relations between the parts in play was brought into being at moments in time. Poise is discussed further in the following chapter.

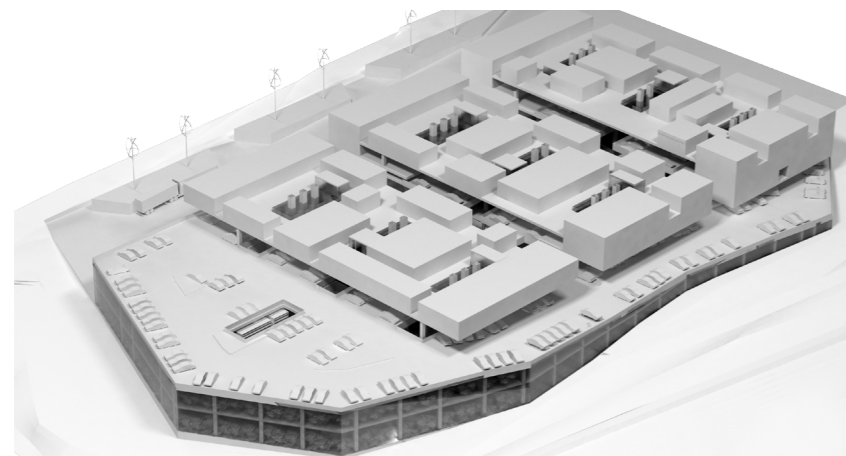


figure 3.21: Ecotech with greenhouse to the perimeter.



figure 3.22: view from the first moment of poise in the sequence at Albany
photography: Simon Devitt

figure 3.24: view from the threshold between the dining room and kitchen at Haast Street
photography: author

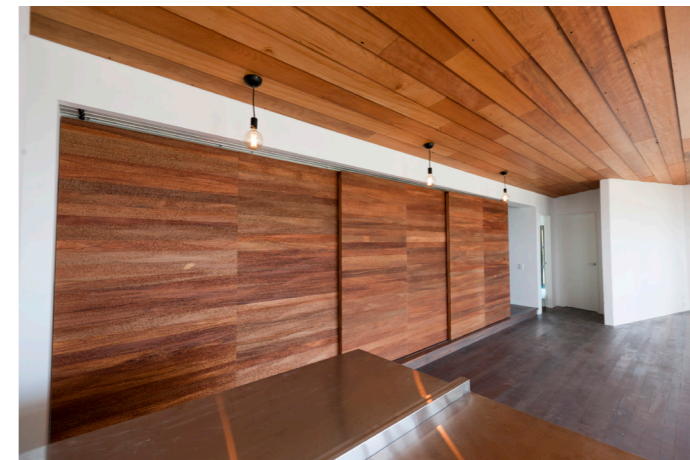


figure 3.23: looking toward the entry space at Langs
photography: Sajeev Ruthramoorthy

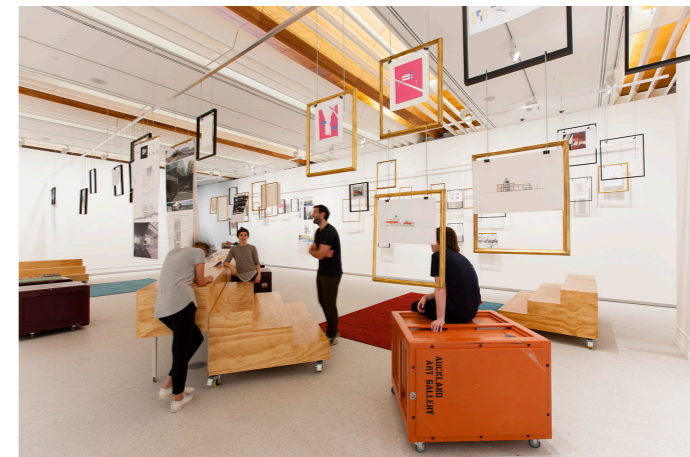


figure 3.25: looking into the Lab from the threshold
photography: Lucas Doolan

A compositional condition and the nature of composition

The purpose of the compositional taxonomy was to articulate the compositional tendencies that were felt to be operating inside the work. However, its overall effect stretched beyond that articulation, to mobilising those tendencies, to ultimately shine a light on the nature of composition more generally.

The compositional taxonomy initially described certain tendencies observed in the work in terms of a set of six parts and three qualities of relation between the parts. Through this description another layer of tendencies was articulated that concerned material differentiation between independent parts in a way that fed back to support the ideas of the parts and relations. The terms themselves gave greater agency to the tendencies in the design project ecology. By giving them names and by reflecting upon the operation of the tendencies in the work through their names, the tendencies were drawn to the fore. It had the effect of sharpening my attention to them to the point where I saw evidence of the parts and qualities in almost every aspect of the work. At Haast Street and the Lab, I was aware of actually feeling for tension, provisionality and poise as ways to understand when things were coming into being inside the ecology. So the effect of calling the tendencies out through giving them names was to set the terms and the tendencies in some sort of self-reinforcing relation. But it is important to point out that this relation didn't play out to the extent of fixing the tendencies the name described.

At a different scale, as the taxonomy developed, it also became clear that the tendencies themselves were intimately connected with one another to the point where changes in one tendency or term brought about changes in others. In other words they were contingent upon each other and the taxonomy itself was provisional. Other evidence of this interconnection was noted in the relationship between tension and provisionality, where the former lay down the conditions for the latter. The level of interconnection noted was evidence that supported a feeling that the tendencies were particular, identifiable aspects of a larger, shifting whole – a compositional condition – underlying the practice. The taxonomy began to make it visible, but again, not to the point that it fixed the compositional condition. Instead, the taxonomy developed to account for discrepancies between the specific project outcomes and the understanding of the compositional condition it described. The taxonomy sat alongside the Haast Street and Lab projects as a sort of intermittent lens through which to understand the compositional condition and the shifts it made through the projects as the projects unfolded and after they had been completed. The compositional condition, along with the tendencies that constituted it, and the taxonomy that described it, remained provisional.

It was this property of provisionality that the Lab successfully represented in the built outcome. With that, it provided some deeper insight into the larger issue at hand. The project contained a complex of relations wherein every part and relation potentially had agency in relation to everything else. Through writing and drawing the project into the taxonomy the

sense grew that the Lab reflected not just Ark's compositional condition, but the nature of composition more generally. Inside the design project ecology, composition was a state where things and relations congealed and became viscous for periods of time but never quite set, meaning that the nature of composition was one of relational flux and perpetual non-fixity. Composition wasn't about fixing things in place. In fact, it appeared that there was no such thing as a fixed composition, for the relationality inherent to it was too complex to ever not be provisional because there was always something unfolding, being experienced, realised. Langs, Albany, Ecotech and Haast Street had new light thrown on them. None of them were compositionally fixed. The reason for striving to express provisionality was because that was precisely the compositional quality of their relations.

To return to the taxonomy, it operates in a looping relation with Ark's compositional condition, but that relation remains relatively open. At this stage in the life of Ark the information from the terms and the taxonomy that feeds back into the compositional tendencies and condition isn't directly compositionally determinative, but the terms and the taxonomy do have agency in relation to one another inside the design project ecology. The concern for Ark is that both the taxonomy and that the compositional condition continue to evolve. The risk of articulating the compositional condition too firmly through the taxonomy is that the loop becomes too closed, that the taxonomy starts to lead rather than sit alongside, and that the taxonomy might come to be used as a predictive mechanism rather than reflective lens.

Ark's compositional condition isn't a fixed set of terms, parts, relations and tendencies but something that continues to adapt and evolve with each new project. It remains ethereal and difficult to pin down. It is the thing that I search for in the design process (and that the taxonomy catches up with), rather than the thing (caged inside the taxonomy) that I go into the design process armed with.

POISE

Pursuing the emergent

Chapter 4



This chapter outlines the development of poise through the research. It moves on to elaborate upon the emergent qualities and why they are something to strive for and develop in the practice. The chapter concludes with a discussion of how these emergent qualities have brought me to reconsider the Auckland School.

A moment of poise

I was returning with my family from two weeks holiday on Great Barrier Island. The four hour journey on the car ferry across Auckland's Hauraki Gulf had been punctuated by two extensive dolphin escorts, flocks of diving gannets and whale spouts. But against the collection of camera-worthy moments, what stood out was one that would have been far more difficult to capture.

It was seven in the evening and we were travelling into the sun as it was getting lower. Rain clouds loomed dark grey over Waiheke Island and Motuihe Island about a kilometre to the south. The sun kept my right side warm as I stood on the upper deck, and watched the rain begin to fall on Waiheke's western-most vineyards and into the passage between the two islands ... and then the clouds broke. Interspersed between sheets of rain, light streamed through the clouds into the passage and onto the water – parallel shards stepping back between the islands towards the Whitford shoreline. I smiled. Looking around, it seemed that few if any of the other passengers were getting this the way I was ... and then the light faded as the ferry moved on. The show lasted two minutes perhaps – it was fleeting. Against the shared spectacle of the dolphins, the gannets and the whale spouts, this was the experience that mattered most to me. Fairly fresh from completing the first draft of this text, I realised what had become of 'poise'.

Dictionary.com provides a definition of poise as a state of "suspense or wavering, as between rest and motion or two phases of motion: the poise of the tides"¹ In the context of the work of Ark, poise is a condition experienced at thresholds. It began as an experience of passing from one spatial condition to another. What it became on the journey from Albany to the LAB is the experience of somehow being caught between states at the moment when things are brought into being. They are moments such as those encountered in the making of the Kinetetras project at the AADRL described in chapter 2, 'TENSION: An emergent quality of the design project ecology'; and the experience of the swing in the research catalysed by the project taxonomy described in chapter 3, 'PROVISIONALITY: The provisional compositional taxonomy'; and the encounter on the ferry where I experienced a moment of poise in relation to a moment of poise where I realised what poise had become.

¹ Dictionary.com, <http://dictionary.reference.com/browse/poise?s=t>, accessed 05.04.14, 9.47am.

Poise happens in the design process ...

Note from 14.02.11 (while modeling phase two of Langs in Rhino):

"When I am modeling in a faster manner resonant conditions present more quickly, not quite in an instant, but in ways and at speeds which tend to surprise. They produce mild excitement. I smile, I get itchy in my hamstrings, I have to move around, I sit back, I stretch. I get keen. I work for these moments.

When I am making in a more focused, singular, slower manner, perhaps focused on resolving a single issue, resonance is felt in an absence of the agitation that builds in me when I work this way. This is a calmness. It dawns. It is relief. I get it when the pieces I am concerned with are set in relation to each other in a way that is good, pleasing, consistent with each other and/or the whole."

... and it happens in space.

Developing poise

Claude Megson used the word 'poise' to describe a particular quality of threshold, often between public and private spaces.² Encountering this kind of moment of poise, where social conditions were about to change, required one to be composed. But there was also a sense that these were spaces through which to admire and to be admired – they were spatial frames of a sort. As I was working on articulating the entry for the Albany house it became important to me to separate the interior wall adjacent to the entry from the exterior wall that the front door was set in. The 400-millimetre gap between the perpendicular walls allowed a fleeting glimpse of people as they passed through the front door. And I recalled Megson's discussion of poise vividly. How this space of poise at Albany differed from Megson's was that it was not one where people would admire and be admired. Instead it was a space where one would be aware of being seen through a fleeting spatial, visual, aural connection which built an expectation of final arrival and release into the space. I put this aside.

Note from 15.02.11 (while modeling phase two of Langs in Rhino):

"I have assembled 9 options. I have rolled around and around the model in Rhino trying to find the best shot / position to make decisions from. I always end up addressing the building from the approach. This is consistent with the Albany house. The design of the approach to the building seems to be a driving concern ... or perhaps more accurately, the concern is for the designing of the condition that establishes the protocols of approach to the building, of the graded transition from public to private. It is evidently very important."

At some point soon after making this note, I recalled the term 'poise'. It seemed that the protocol of approach I was establishing at Langs, and had established at Albany, consisted of a number of moments of poise: I had co-opted Megson's term, and in doing so I had shifted what it meant to me.

² John Dickson, one of Claude Megson's colleagues at the University of Auckland, also used the term 'poise'.

Up until this point in the research the only thing discussed as being consistent across the projects was the design process I was working through. The connection of Langs to Albany through this shared concern for a 'protocol of approach' was the first sense I had of something being common to the projects. But the last moment in the series at Langs was different, it was less concise, there was more going on. Ecotech presented one pronounced moment of poise in the form of the green wall interface between the factory and the motorway. It challenged the idea of a protocol of approach but the idea of poise was embedded. The benefit of the LAB in relation to poise was that it demonstrated two different types of poise in close proximity. It enabled me to acknowledge that I was drawn to the more dynamic, fleeting type. The fourth moment in the protocol of approach at Langs made more sense with this understanding. It punctuated the sequence with the moving cabinet and doors setting in 'play' the composition between the parts in tense, provisional relations.

It seemed that, through the research, poise had developed from being a kind of subject/object-in-frame condition into one much more aligned with the idea of an ecology of relations. Within that ecology the role of the designer is not to prescribe the when, where and how of the experience of poise, but to bring into being the potential for poise to be found in the project, and then found in slightly different ways at different times again and again.

Poise and the variable

Note from 07.04.11 (reflecting on the drawing):

"I packed up the Langs work and relocated it to my office at the University. I ran across the second 'quilt' drawing (figure 4.1). It shows a concern for occupying the site in multiple ways. Even if, or perhaps because these are shown somehow compartmentalized, the interesting bits are the lines, the interfaces between these pockets of programme/space."

At Langs the idea of the lines being interfaces that articulated relations between different conditions was related to the sliding doors and the sliding cabinet between the two living spaces (figure 4.2). The spatial, social and physical change that the doors effected in the space was striking. Lesser instances of the same sort of thing became apparent upon reflection in the awnings for the Albany house, and in the greenhouse at Ecotech. This simple thing that had the capacity to effect comparatively larger qualitative change took on the term 'variable' in the first draft of the taxonomy.

It has become increasingly clear in the time since that the variable is the main means by which poise might be found in different ways and at different times in a project. But while the relation of the variable to poise is close, it is also slippery and not one of cause and effect. The other parts must be set up in a way that allows the variable to have that effect. At Langs, the fourth moment of poise in protocol of approach was one that kept repeating as a problem in the design process. It became a site of design investment, it demanded attention. As I worked into it, it seemed to become more so. Many of the compositional issues that have been identified since – approach, material differentiation, parts, and negative details – converged on this point to create an intense microcosm of the whole. The small act of sliding a part in this microcosm effects a change that then ripples back out into the whole.

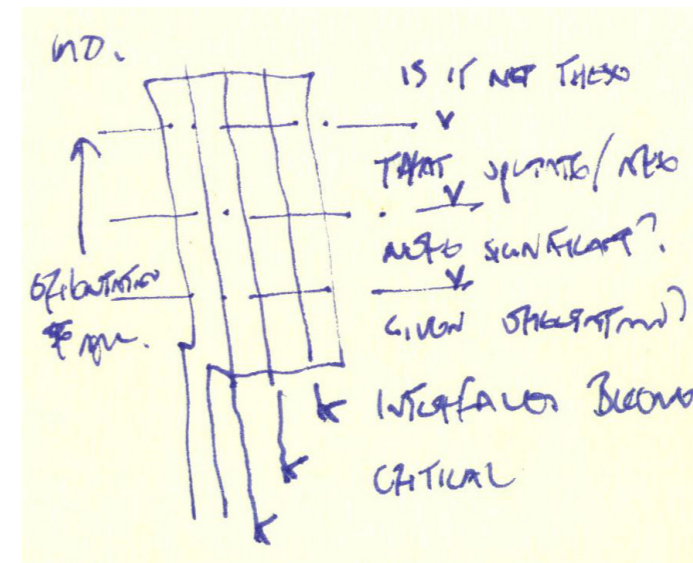


figure 4.1: second 'quilt' drawing



figure 4.2: interface between the living spaces at Langs
photography: Sajeew Ruthramoorthy

Valuing qualities

Tension and provisionality have become criteria upon which the work is evaluated as it is emerging. Poise is another in as much as it is indicative that something significant has happened in the work. But it is not the only way of knowing something has happened. What is pursued initially through the making is any sort of feeling at all. Every emergent quality has value, at least to begin with, as it is indicative of something being brought into being in the design project ecology. The sense of things 'forming up', 'taking shape', of relations between things aggregating, congealing, emerging is what composition is about.

While focus developed on tension, provisionality and poise as criteria, it isn't that these are the only qualities that are sought in the work. But the research has demonstrated a predisposition in the practice toward these qualities. In turn, through focusing on them, the research has reinforced them – now they are more sought after. That reinforcement has shifted them from being discrete experiences to being categories of affect. This isn't an issue of convenience but a measure of how an attention to these 'types' of condition has grown through the research. How this unintended categorisation plays out in the text is that the qualities also become known by other names: 'Irritation' aligns with tension; 'resonance' in the sketchbook notation aligns with provisionality; points of inflection in the work align with moments of poise. The value of designing in this way – pursuing and developing an attention to the emergent qualities of relations as they form inside the design project ecology – is that it both differentiates and provides direction to the design process. The following demonstrates this idea on certain terms.

Critical development

In situating the research, making with architectural media was posited as architecture's principal means of critical development. A problem was outlined in this respect with the field of modernist tectonics as represented by the Auckland School in that its principle means of critical development has been narrowed over time to consist largely of images of itself. The model of the design project as an ecology admits images of other projects but as particular agents in a complex system consisting of multiple agents brought into being through the making. With that, making is brought to the fore. The affects felt in the making become the criteria. While images as agents impact upon the criteria, they are not criteria in themselves. Rather than leading the design, they are repositioned as agents that support a direction that emerges through the affects felt in the making. A design process which privileges making and emergent qualities and affects might well develop a sense of internal integrity and with that may also come confidence in the process and the outcomes. The subsuming of the image as an agent inside the ecology, rather than holding it as the external criteria against which outcomes are assessed, has the potential to prise open the tight circular cage that modernist tectonics has created for itself. An unexpected effect of working in this way with Ark has been the development of an attention to the architectural compositional qualities present in images of other work,

and through those images a sort of projection as to the qualities their designers were encountered in their making. It has become a way to read architectural composition as both noun and verb, as well as a way to consider the Auckland School slightly differently.

Composition (noun)

To take Jim Hackshaw's Thom house as a case in point. The courtyard typology is articulated through a geometrically rigorous plan and exaggerated differences between the material properties of the parts (figure 4.3). A rectangular ring of timber parquet defines the interior circulation space adjacent to the courtyard. The flooring to the interior spaces bordering the parquet all jar with it. Materials range from linoleum to cork to carpet depending on the programme of the space. Red brick cladding defines the exterior perimeter wall of the building inside and out. Rising from it is a clerestory – a modular band of windows. Floating timber furniture masses are set perpendicularly to the perimeter wall as the principal means of dividing interior space. The timber masses stand between the brick and the timber post and beam configuration to the outer edge of the parquet. From the inner edge of the parquet, reaching full height on all four sides of the courtyard is a timber framed glazing system. The courtyard glazing, the top edge of the beam, the internal partitions, and the exterior perimeter wall all rise to the same height and stop, thus defining a datum level. The raking ceiling (perhaps unusually for a Group Architects house) is white-painted plasterboard, uninterrupted by exposed structural elements. Its lightness and smoothness sets up a juxtaposition with the fine module and weight of the red brick. On all four sides, the ceiling rakes up from the beam to the top of the clerestory above the brick wall. A negative detail of sorts results which draws attention as it expands with the rise in the ceiling.

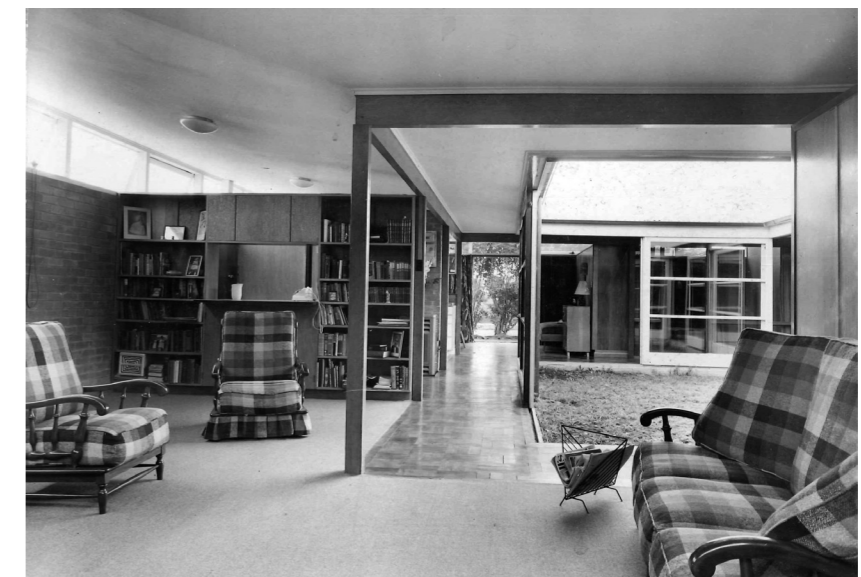


figure 4.3: Group Architects (Jim Hackshaw) Thom House (1954)
Group Architects Collection (GP42), Architecture Archive, University of Auckland Library

At the Thom House, Hackshaw stretches the typical Group tectonic through exaggerating the material differences between the parts to the effect of intensifying the compositional qualities typical of Group houses. Not only is there discontinuity between floor, wall, and ceiling but through exaggerating that property, Hackshaw achieves a sense of lift and lightness in the ceiling/roof element which conveys a corresponding feeling of grounded-ness to the floor. He also achieves a sort of compositional hierarchy between the parts. The brick carries a weighty sense of primacy in relation to the lightness of the roof; the timber masses, the post and beam and the glazing operate at a second level; loose furniture and artefacts operate at a third. This 'hierarchy' is indicative of the clarity of the compositional system at play that runs from the geometry of the plan through to the qualities of relation between the parts (figure 4.4).

To provide an overlay on the terms established through the research: the parts are bound together by the constraints of the geometry; there are tensions between the parts set up by their material differences; the ordinariness of the materials is a way to maintain focus on the tensions rather than the parts in themselves. The result is a whole that presents a sense of the provisional. The roof is already lifting off and if the geometry was to be loosened it might be followed by the clerestory, and then maybe by the timber masses. This overlay also helps explain an odd juxtaposition in the interior image with the checked fabric, turned leg lounge-suite set against the straightness of the remainder. It isn't an error in aesthetic judgement, nor is it only about attempting to 'normalise' domestic modernism in New Zealand. The lounge-suite in the image introduces another tension and punctuates the provisionality of the composition.

Poise occurs in transitioning from the living space to the courtyard across the threshold articulated by the parquet. It isn't framed nor precisely defined but the potential for it to be found in various ways has been designed in. This is a casual sort of poise that shifts with light, social situation and the position of the sliding glazed panels to the courtyard. This casual quality set within the strict regime of the geometry adds further to the sense of the provisional.

In writing about the Thom House as an outcome in this way I found myself projecting a sense of how Jim Hackshaw might have felt in designing it, and a sense of what he was looking for.³

³ Before writing about the Thom House, as the drawings for the taxonomy were developing, I had sketched the house in the manner of the taxonomy – as parts in relation. That sketch finds final form here. Through drawing Jim's work in the same manner as I had drawn my own, I got the feeling that I was working with a set of compositional goals that were similar to Jim's even if I wasn't fully aware of doing so or even what they were until they were articulated through the taxonomy. Just as with the projects in the taxonomy, the compositional parts in the Thom house were expressed as whole entities in their own right. Their boundaries were made clear and often held apart in efforts to maintain clarity in the relationships between them. Negative details amplified this sense. All of a sudden, through observed common compositional tendencies, the nature of Ark's connection to the Auckland School gained a level of clarity.

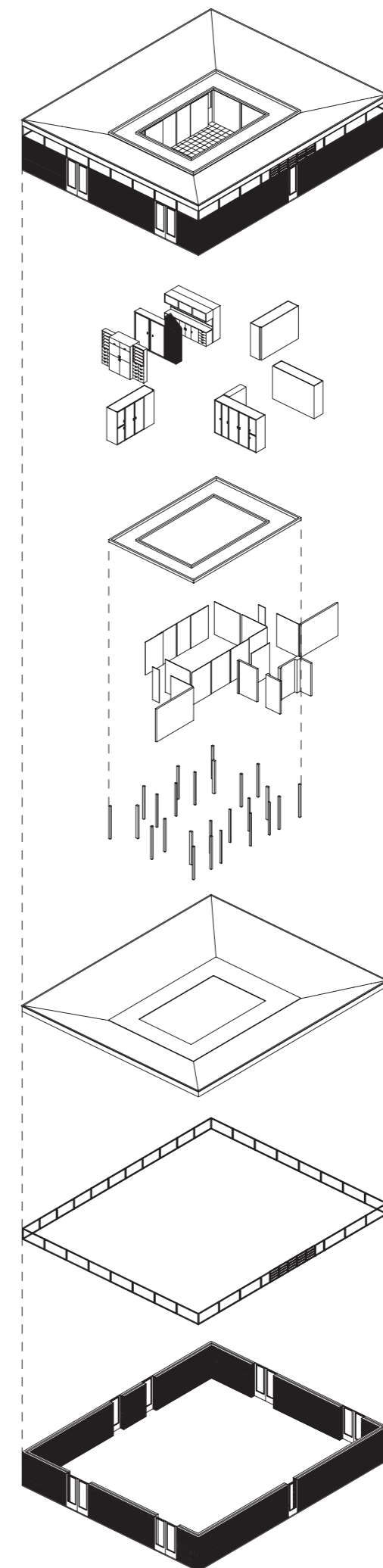


figure 4.4: Thom House compositional parts

Composition (verb)

Claude Megson ran an elective lecture paper titled Composition, Scale and Proportion. While he used the language of moments of 'perfection' and was invested in the idea of 'genius', he also drew (and drew) on the blackboard in lectures (most often in plan) to the effect of providing students with a sense of something emerging through the drawing. His actions demonstrated a process while he spoke of an outcome, an outcome that was not present but he spoke of it as if it already was as he drew. While certain lines remained light, as he worked back and forward across the board others would aggregate to become heavier. The different weights of line were translated as he spoke into different material parts and programmed spaces in the emerging composition. And these parts were spoken of in the same breath as the spatial experience he was creating as he brought them into being in his drawing. All the while he was referring to the unseen as if it was there for all to see, when he was instead pursuing qualities of relation as they emerged through the making. His gift as a teacher was that he was able to convey that sense of the emerging quality through the action of his drawing so his students got a sense of the sort of feeling they were to look for in their own work. Although his drawing practice was more concise, I saw the same search going on as Jim Hackshaw drew with his shaky hand in the studio. This was the clue to understanding composition in architecture as a verb: It is an iterative, material, purposeful, discursive pursuit for qualities of relation, a search that follows the emerging sense of those qualities felt through the making. But the schism (or tension) between Claude's narration of the emerging composition as something already present, as we were watching it being brought into being through the actions of his drawing, highlights what was desperately lacking in (my) architectural education in the early 1990's: we lacked an architectural language of design process through which to explore how spatial and material composition emerges through that process, without deferring to the 'poetic', 'art', 'genius' or 'perfection.' We lacked what could be seen as a language of emergence to explain how composition as a noun is brought into being through the act of composition, or as a verb.

An aside: Note from 15.04.11 (whilst finishing the phase two model):

"I am engaged in the task at hand, in the serial operations required by that task. I am assembling the different pieces, in their different relationships. There is a repetition in the quality of the action if not the specific action. My back is sore. 8pm: I feel mild disappointment as the roof goes on. I loved it without the roof, with the voids in the pergola playing off against the walled voids the roof was yet to cover. It suggested other possibilities."

That mild disappointment was in part due to the relations that I had been working toward being obscured as the roof went on – I couldn't see the complete set of parts and relations present in the model at a glance any longer. It also had to do with the finality of it: the cessation of the excitement of the pursuit of possibilities in the project at this level. And it was also because the fleeting moment of poise when it was all coming together had passed.

CONCLUSION



The irony of pursuing this PhD by practice as a sole practitioner has been that the practice the PhD reflects upon has necessarily slowed and retracted in order to produce the PhD that reflects upon it. The Head of Programme role, as the latest in a succession of such roles at the University of Auckland, School of Architecture and Planning over the course of this study, has provided impetus to that effect – it has been the power behind the brake. These words are written without any sense of regret. Placing Ark in a space between academia and profession, and then in the context of RMIT's PhD programme was deliberate. Through the research the retraction Ark has been through has been conceptualised as a complete exhale before a new breath is taken. This conclusion is the moment between two phases of breath – it is a moment of poise.

Prior to finding space between the academy and the profession, Ark had been relocated from the AADRL to Auckland. It was that shift which set this body of research in motion. At the AADRL my practice fell under the influence of an approach to architectural design that subsequently came to be known as parametricism. When Ark returned to Auckland (still under the influence) the gulf between parametricism and the locally predominant strain of modernist tectonics quickly became apparent.

The challenge of bringing knowledge gained through international experience into a local environment conditioned by persistent, embedded mannerisms is not new. For antipodean practitioners, with their well-recognised propensity to travel and work abroad, it may even be something to expect upon their return. But Ark's struggle highlighted a broader problem, one seldom recognised and yet surprisingly common: How might different approaches to architectural making be brought together to create new architectural works? This question became the wider focus of this doctoral project.

Enquiry & process

The enquiry took the form of a situated reflection. It looked at the work of one specific practice, one particular instance of the problem, and it demonstrated one way through which it has been addressed. But it did so in a manner that renders the research outcomes generalizable.

The research reflected on personal experience and interrogated a body of work that, while being close to me, is especially relevant to the wider problem articulated. It did so through a clear structure and an exacting process of observation to the effect of yielding a valuable body of information that might be accessed strategically and used in a knowing manner when creating new work. The process thus articulated has use for designers wanting to unpack and develop their own ways of working.

The particular path through the sphere set up by the larger research question followed Ark's attempts to operate with both the parametricism of the AADRL and a particular lineage of modernist tectonics that has been referred to here as the 'Auckland School'. Common ground upon which to discuss these two disparate architectural canons

was discerned to lie in the area of architectural composition where composition was investigated as both the act of forging relations between entities (through making) and as the outcome of that act. By contrasting different compositional characteristics of each field, the research was brought to a finer point in the form of a more precise research question: How can the two different emphases that tectonics and parametricism bring – respectively, the composition of tectonic parts and the on-going process of formation – be reconciled within the one approach to architectural design?

A (provisional) compositional taxonomy was deployed as a mechanism to examine five of Ark's design projects in terms of their compositional characteristics to determine how each field was impacting on the work and the nature of the relationship developing between them in the practice.

Contribution to knowledge

Ark's provisional compositional taxonomy reviewed the Albany house, EcoTech, Langs Bach, Haast Street and Lab projects. All were shown to involve differing forms of the same six types of compositional part: the diagrammatic volume, constructed space, articulated plane, mannered skin, operative backdrop and variable. Having been well documented in each of the projects, and having noted differences in their appearance and role across the work, the parts were considered and described more generally in terms of the 'pattern' of behaviour observed. It was found that because they were held to be provisional rather than definitive and fixed, they were able to be reworked and redeployed inventively in new projects. The presence of discernible parts was linked to Ark's activity in the field of modernist tectonics.

Similarly, qualities of tension, provisionality and poise reappeared repeatedly in the relations that held the parts of each composition together. The presence of these types of compositional relation as indicators of the on-going process of formation, as well as the emphasis on the evolution of the parts, was associated with the continuing influence of parametricism.

Chapters that subsequently reflect on tension, provisionality and poise in the work demonstrate how and where the composition of tectonic parts and the on-going process of formation are being brought together within the one practice. This is where the contribution to knowledge lies.

The exhibition and presentation of work captured in the video recording that accompanies this document acts as a real-time demonstration of the proposition. By means of a composite 'vessel' containing material agents – models, drawings, material samples, and the like – the presentation shows how parts are brought into provisional relations via a 'method' that foregrounds an attention to qualities of relations that emerge between the parts in the process of their recombination. The method guides the establishment of new compositions and thus the performance shows how the two different architectural canons are in operation within the one approach to design.

However, across the live presentation and this written document, the problem of how to generate a new type of aesthetic outcome by reconciling these two approaches is not 'solved' in the work, nor is this 'resolution' claimed here. Rather, the coexistence of these two influences is set up as an on-going challenge to be worked with. The two approaches operate in relation to one another inside the one practice in a way that allows for their individual development through the tension between them. It embraces the idea of the evolution of a set of well understood compositional parts.

The contribution to knowledge made by this doctoral project is to be found in its demonstration of an approach through which two different architectural design paradigms might be brought into productive relation. The approach is able to be adapted for personal use and according to individual experience and therefore has potential to be used more generally by practitioners, academics and students.

Other findings and areas of further enquiry

On the path to the point where this contribution was able to be concisely and precisely set out, a number of other findings were made in relation to architectural composition that warrant further enquiry. This is a moment of poise in the research, where a new phase of practice-based enquiry into questions that developed through this project begins, and this research becomes part of a framework, a conglomerate of agents, that will inform subsequent investigations.

This work aims to counter the general perception of 'composition' in architecture as being staid and old-fashioned. Rather, it becomes possible to see the degree to which composition, as an idea and an activity, remains central to architectural practice. The term was used hesitantly at the outset. I studied at the University of Auckland, School of Architecture at a time when significant emphasis was placed on architectural history. Courses included one titled "Composition, Scale & Proportion".¹ Proportioning systems such as the golden section were discussed in terms of their persistent appearance and formal determination of temples thousands of years old, churches in their hundreds, and particular modern works. While the discussion was enlightening in terms of architectural history, it presented universalised, enduring rules that governed architecture, rather than tools to be worked with.

Two decades later, when it was reintroduced as a lens through which to view my own work, the term retained a residue of predetermined geometric ideals and fixity.

By approaching composition as an issue of the relations between things I have shown how composition can be understood as a dynamic, processual and experiential problem. There is something dynamic within compositional relations often due to their configuration, because

¹ "Composition, Scale & Proportion" was a lecture course taught by Claude Megson at the University of Auckland, School of Architecture in the early 1990's.

of the way they are experienced, and because they are a reflection of the process that brought them into being. The extent of the dynamism and the potential for change within the design project is made all the more clear when it is approached from inside the design process. From this point of view, the project becomes a flexible set of dynamics that adapts in relation to constantly changing conditions. Change, then, is fundamental to an idea of composition that focuses on relations between things. This is profoundly different to the notion of composition as a static arrangement of parts.

Key to this understanding was a conceptualization (influenced by the model of emergence) of the modernist tectonic design project as an ecology. The ecology is a set of interacting agents which shift in relation to one another to the effect of the whole evolving over time. The range of agents stretches from the emerging parts of the design; to the media used; to the client; to the space the client meeting is held in. The ecology exists in a state of perpetual non-fixity where the level of viscosity in relations between the agents changes with circumstance over time. The importance of an attention to the qualities of these relations is that they indicate changes in their viscosity – they are indicative of things being brought into being in the design project.

Making is the means by which the agents of the design project ecology are brought into relation (if not also into being). Notes and sketches made in the design of the Langs bach and the Kinetetras project at the AADRL showed that the making is a quest to bring about certain qualities of relation in the ecology. The same work enabled the observation that these qualities sought in the (making) design process tended to be reflected in the design outcome. This reflection was shown to be a result of the compositional process and outcome not being separate from one another but being different phases of the on-going evolution of the design project. There is potential in this discussion to reinvigorate the notion of composition in relation to architecture generally.

Foregrounding a discussion of compositional agendas inside parametricism could catalyse an expansion of the field. The image of the architect as the designer of the system that finds form according to its own internal logic would have to be shifted. It would need to acknowledge the architect as the agent that works with purpose toward a particular aesthetic end (at least) through making creative editorial decisions in terms of the input, operation and output of the system.² With that, other issues may find the space to be brought forward, including that of inhabitation and relations between parametric systems and what they are set in relation to ('context') – not as a quantified set of selected inputs, but as something more obviously subjective. Addressing these kinds of basic architectural issues may readily facilitate connections to other fields where the ramifications of a parametricist approach to architectural practice might unfold. The actual evolutionary potential that Schumacher sees for the "... solid new paradigm for architecture ...: parametricism"³

² Roland Snooks makes an argument along these lines in his PhD "Behavioral Formation: Multi-Agent Algorithmic Design Strategies." PhD diss. RMIT University, Melbourne, 2014.

³ Patrik Schumacher, "Style as research programme" in *DRL ten: a design research compendium*, ed. Tom Verebes (London: AA Publications, 2008), 11.

might well be found in the material operations and augmentation of everyday practices. For such practices (Ark included) the implications of a shift in focus from things to relations between things is that compelling architecture might be made by bringing ordinary things into particular relation to make the extra-ordinary.

For modernist tectonics a process-oriented model of how design comes into being (such as the design project ecology) would underline the central importance of making practices to the field. They might be brought in from the margins and a new investment in an (already) expanding range of architectural media may follow. With that, the field's means of critical development could be restored to it.

This set of ideas about architectural composition uncovered through the research, forms the framework through which particular problems with the Auckland School have been identified and will be approached in due course. In turn, the outcomes of this next phase of work are expected to feed back into the field of modernist tectonics and the wider discipline.

Articulating Auckland's local strand of modernist tectonics in terms of the compositional tendencies it demonstrates is a project that warrants attention. Existing commentary on the Auckland School doesn't refer to it by this or any particular name. It is fragmented and predominantly provided by local architectural historians concerned with what distinguishes architects and individual works rather than the implicit compositional agendas that might unite them as a larger body.

So how might the Auckland School be articulated more broadly in terms of compositional characteristics? This is a long term, open ended project that I hope to catalyse and contribute to. One way to begin may be to take the analysis of Jim Hackshaw's Thom House presented in chapter 4 as a model and do the same for certain other 'Group Architects' projects. The drawings would form the base for the construction of a theoretical mapping of what the practice's provisional compositional taxonomy may have looked like. The same could be done for others contributing to the lineage. Setting this kind of work alongside Julia Gatley's work on 'the Group' for instance, may provoke discourse on the Auckland School as a discernible entity.

Stories

The story of the compositional taxonomy was not the only story of interest to me despite this document presenting it as such. It was, rather, the lens through which snippets of different accounts, recollections, readings, conversations, ideas and concerns were able to be pursued, extracted and drawn into relation to define the composition that is this PhD. This is a story of stories. We tell ourselves these kinds of stories about ourselves to the effect of defining ourselves.

Certain stories were admitted into the research in the belief that they held some sort of integral relation to the practice, while others weren't. Certain stories that were admitted were followed further than others in the pursuit

of the unseen, unnamed condition that distinguished the practice to the point where their sense of usefulness in that pursuit was exhausted. And certain stories, such as that of 'craft', were picked up, followed, and put down again repeatedly. But the majority of the stories that the research progressed through aren't told in the document. In other cases they are told in a way which cast them into the background. A story of geometric/material systems is one that remains untold, but it is one that I am convinced will play out in time; the story of post-digital drawing practice is one that became part of the background; the story of vertically integrated practice is untold; the story of material reuse is another that is embedded in a couple of the projects. So while this is a story of stories, those stories have been carefully selected.

This story of tension, provisionality and poise effects an account of Ark and what distinguishes it as a practice – but it is one I remain suspicious of. Perhaps this is one result of having held the experience of the AADR to be singularly definitive of Ark for so long even in the face of evidence to the contrary. Gregory Bateson reminds us of the risk of mistaking the story for the substance, or mistaking the model for the modelled:

“... whenever we pride ourselves upon finding a newer, stricter way of thought or exposition; whenever we start insisting too hard upon “operationalism” or symbolic logic or any other of these very essential systems of tramlines, we lose something of the ability to think new thoughts.”⁴

Just as there is a difference between the compositional taxonomy and the compositional condition the taxonomy describes, there is a difference between this story of Ark and Ark as a practice. The story is determinative of a set of findings made through the work but not of the work or the practice itself.⁵ It is accurate in this moment but the discrepancies between this story of Ark and Ark itself are expected to grow as the practice evolves. These kinds of stories we tell ourselves about ourselves need to keep being remade, they must remain provisional.

⁴ Gregory Bateson, *Steps to an Ecology of Mind* (San Francisco, Chandler Pub. Co., 1972), 75.

⁵ Johnathon Hill, “Design Research: The First 500 Years,” in *Design Design Research in Architecture : An Overview*, ed. Murray Fraser (Surrey: Ashgate 2013), 15-34.

Bibliography

Texts consulted during the research period

- Abruzzo, Emily, Eric Ellingsen, and Jonathan D. Solomon. *Models*. 306090 books. New York, N.Y., 2007.
- Alexander, Christopher; Ishikawa, Sara; Silverstein, Murray. *A pattern language*. New York: Oxford University Press, 1977.
- Alexander, Christopher. *The timeless way of building*. New York: Oxford University Press, 1979.
- Allen, Stanley. "Artificial Ecologies: the Work of MVRDV". El Croquis, no. n.86 (1997).
- . "From object to field." *Architectural design* 67 (1997): 5-6.
- Allen, Stan. *Points + lines : diagrams and projects for the city*. 1st ed. New York: Princeton Architectural Press, 1999.
- . "Revising our expertise," Hunch: the Berlage Institute report 3 (2003): 64-66.
- Allen, Stan, and Diana Agrest. *Practice: architecture, technique + representation*. Oxfordshire: Routledge, 2009.
- Allen, Stanley, Reyner Banham, Thomas Pynchon, and Mike Davis. "Los Angeles: 4 (artificial) ecologies." Hunch: the Berlage Institute report 1 (1999): 18-23.
- Allen, Stanley, and Horacio Torrent. "Mathias Klotz." 2G: revista internacional de arquitectura = international architecture review, no. 143 (2002).
- Allpress, Brent. "The ornamental conditions of architecture." MArch diss. University of Auckland, 1995.
- Aranda, Benjamin, and Chris Lasch. *Tooling*. Pamphlet architecture. 1st ed. New York: Princeton Architectural Press, 2006.
- Atorie Wan., Yoshiharu Tsukamoto, and Momoyo Kaijima. *Bow-Wow from post bubble city*. Tokyo: INAX Shuppan, 2006.
- Barrie, Andrew. "Aesthetic Robin Hoods: The Group and Japan, California, Scandinavia." In *Group Architects: towards a New Zealand architecture*, edited by Julia Gatley. 209-16. Auckland: Auckland University Press, 2010.
- Bateson, Gregory. *Steps to an ecology of mind; collected essays in anthropology, psychiatry, evolution, and epistemology*. San Francisco.: Chandler Pub. Co., 1972.
- Bennett, Jane. *Vibrant matter : a political ecology of things*. Durham [N.C.]: Duke University Press, 2010.
- Borbein, Adolf Heinrich. "Tektonik, zur Geschichte eines Begriffs der Archäologie." *Archiv für Begriffsgeschichte* 26, no. 1 (1982).
- Bosse, Chris. "Solo virtual office." Paper presented at the Stand and Deliver: Concept and Detail, NZIA Conference, Auckland, 2008.
- Brooks, Frederick P. *The design of design : essays from a computer scientist*. Upper Saddle River, N.J.: Addison-Wesley, 2010.
- Burry, Jane & Maher, Andrew. "Building Bridges." *Architectural Design Research* 2, no. 1 (2007): 115-36.
- Burry, Mark. "Between Intuition and Process: Parametric Design and Rapid Prototyping." In *Architecture in the Digital Age: Design and Manufacturing*, edited by Branko Kolarevic. 148 - 62: Taylor and Francis, 2003.
- . "Blurring the lines: an exploration of current CAD/CAM techniques, parametric design and rapid prototyping - mediating between analogue and digital skill sets." *Architectural design* 73 (2003): 110-18.
- . "Paramorph: anti-accident methodologies." *Architectural design* 69 (1999): 9-10.
- Burry, M. & Holzer, D. et al. "Parametric Design and Structural Optimisation for Early Design Exploration." *International Journal of Architectural Computing* 5, no. 4 (2007): 625-643.
- Cache, Bernard. "Towards a fully associative architecture." In *Architecture in the digital age : design and manufacturing*, edited by Branko Kolarevic. 139 - 46: Taylor and Francis, 2003.
- Chaszar, André. *Blurring the lines. Architecture in practice*. Chichester, England: Wiley-Academy, 2006.
- Ching, Francis. *Architecture: Form, Space & Order*. London: Van Nostrand Reinhold, 1979.
- Clark, Justine, and Paul J. Walker. *Looking for the local : architecture and the New Zealand modern*. Wellington: Victoria University Press, 2000.
- Cook, Peter. *Drawing : the motive force of architecture*. Chichester, England ; London: Wiley, 2008.
- Corbusier, Le. *Le Corbusier, my work*. London: the Architectural Press, 1960.
- . *The Modulor*. Basel: Birkhauser, 2004.
- Davis, Michael. "Maintaining the abstract critical facility in post-digital drawing practice." *Interstices* 11 (2010).
- . "Pursuing a sense of the emergent through craft practices in architectural design." *Craft + Design Enquiry*, no. 5 (2013): 49-71.
- Davis, M. J. . "Engaging in the Space of Representation." In *Studio Pedagogy*, edited by R. Buck. Auckland, 2011.
- Dewey, John. *Art as Experience*. New York: Perigee / Penguin Group, 2005.
- Dovey, Kimberly. "The pattern language and its enemies." *Design Studies* 11, no. 1 (1990): 3-9.
- Downton, Peter. *Design research*. Melbourne: RMIT Publishing, 2003.
- . *Studies in Design Research: Ten Epistemological Pavilions*. Melbourne: RMIT University Press, 2004.
- Ednie-Brown, Pia. "The Aesthetics of Emergence: Processual architecture and an ethico-aesthetics of composition." PhD diss. RMIT University, 2007.
- . "Plastic Super Models: aesthetics, architecture and the model of emergence." *Fibre/culture Models*,

- Metamodels and Contemporary Media, no. 12 (2008).
- . "The texture of diagrams: reasonings on Greg Lynn and Francis Bacon." *Daidalos* 74 (2000): 72-79.
- . "Vicious architectural circles: aesthetics, affect and the disposition of emergence." *Architectural Theory Review* 17, no. 1 (2012): 76-92.
- Eisenman, Peter, Stan Allen, and Cynthia C. Davidson. *Tracing Eisenman : Peter Eisenman complete works*. London: Thames & Hudson, 2006.
- Evans, Robin. *Translations from drawing to building and other essays*. London: Architectural Association, 1997.
- Foreign Office Architects., Alejandro Zaera, Farshid Moussavi, and Institute of Contemporary Arts (London England). *Phylogenesis : foa's ark*. Barcelona: Actar, 2003.
- Frampton, Kenneth. *Modern Architecture: A Critical History*. London: Thames and Hudson, 1990.
- Frampton, Kenneth, John Cava, and Graham Foundation for Advanced Studies in the Fine Arts. *Studies in tectonic culture : the poetics of construction in nineteenth and twentieth century architecture*. Cambridge, Mass.: MIT Press, 1995.
- Frasconi, Marco, Jonathan Hale, and Bradley Starkey. *From models to drawings : imagination and representation in architecture*. London ; New York: Routledge, 2007.
- Fraser, Murray (ed.). *Design Research in Architecture: An Overview*. Surrey: Ashgate, 2013.
- Frazer, John. *Evolutionary Architecture*. London: Architectural Association, 1995.
- Friedman, Jonathan. *Creation in space: fundamentals of architecture*. Iowa: Kendall/Hunt, 1989.
- Furján, Helene. "Design/research: notes on a manifesto." *Journal of architectural education* 61 (2007): 62-68.
- Gatley, Julia. *Group Architects : towards a New Zealand architecture*. Auckland, N.Z.: Auckland University Press, 2010.
- . *Long live the modern : New Zealand's new architecture, 1904-1984*. Auckland, N.Z.: Auckland University Press, 2008.
- Group Architects. *On the necessity for architecture : the manifesto of the Architectural Group*. Auckland: Abel Dykes Ltd., 1946.
- Gullström-Hughes, Rolf, John Monk, Open University. Dept. of Telematics., and Metamorphosis (Organisation). *The book of models : ceremonies, metaphor, performance*. Milton Keynes: Published by Dept. of Telematics, Faculty of Technology, Open University in conjunction with Metamorphosis, Centre for Writing and Performance Research, 1998.
- Hagan, Susannah. *Taking shape : a new contract between architecture and nature*. Oxford: Architectural Press, 2001.
- Hayles, N. Katherine. *How we became posthuman : virtual bodies in cybernetics, literature, and informatics*. Chicago, Ill.: University of Chicago Press, 1999.
- Hensel, Michael, Christopher Hight, and Achim Menges. *Space reader : heterogeneous space in architecture*. Chichester, U.K.: Wiley, 2009.
- Hensel, Michael, Achim Menges, and Architectural Association (Great Britain). *Morpho-ecologies*. London: Architectural Association, 2006.
- Ingold, Tim. *Making : anthropology, archaeology, art and architecture*. Milton Park, Abingdon, Oxon: Routledge, 2013.
- . *The perception of the environment : essays on livelihood, dwelling and skill*. London: Routledge, 2000.
- Iwamoto, Lisa. *Digital fabrications : architectural and material techniques*. New York: Princeton Architectural Press, 2009.
- Johnson, Steven. *Emergence : the connected lives of ants, brains, cities and software*. London: Penguin, 2002.
- Kajijima, Momoyo. *Graphic Anatomy Atelier Bow-Wow*. Tokyo: Toto, 2007.
- Kelly, Kevin. *Out of control : the new biology of machines, social systems and the economic world*. Reading, Mass.: Addison-Wesley, 1994.
- Kolarevic, Branko. *Architecture in the digital age : design and manufacturing*. New York, NY: Spon Press, 2003.
- Kolarevic, Branko, and Ali Malkawi. *Performative architecture : beyond instrumentality*. New York: Spon Press, 2004.
- Koolhaas, Rem, Veronique Patteeuw, Office for Metropolitan Architecture. *Considering Rem Koolhaas and the Office for Metropolitan Architecture*. Rotterdam: NAI Publishers, 2003.
- Krier, Rob. *Architectural composition*. London: Academy Editions, 1988.
- Lally, Sean, and Jessica Young. *Softspace : from a representation of form to a simulation of space*. Architecture at Rice University. Abingdon, Oxon ; New York: Routledge, 2006.
- Latour, Bruno. *We have never been modern*. Cambridge, Mass.: Harvard University Press, 1993.
- Liaropoulos-Legendre, George, and Architectural Association (Great Britain). *i, j, p : the book of surfaces*. London: Architectural Association, 2003.
- Lynn, Greg. *Animate form*. New York: Princeton Architectural Press, 1997.
- . "Beautiful monsters." *Perspecta* 40 (2008): 178-79.
- . *Folds, bodies & blobs : collected essays*. Brussels: La lettre volée, 1998.
- . "Multiplicitous and inorganic bodies." *Assemblage* 19, no. 49 (1992): 32-49.
- . "New variations on the Rowe complex." *Any* (1994): 38-43.
- Lynn, Greg, and University of Pennsylvania. Institute of Contemporary Art. *Intracacy : a project*. Philadelphia, Pa.: University of Pennsylvania, 2003.
- Maeda, John. *The laws of simplicity*. Cambridge, Mass.: MIT Press, 2006.
- Male-Aleman, Marta. "Parametric Constructions: An Exploration on Virtual Standardisation." 306090 11, no. Models (2008): 185-89.
- Mayne, Thom, Stan Allen, and Morphosis Architects. *Combinatory urbanism : the complex behavior of collective form*. Culver City, CA: Stray Dog Café, 2011.
- McDonough, William, and Michael Braungart. *Cradle to cradle : remaking the way we make things*. 1st ed. New York: North Point Press, 2002.
- Megson, Claude. "Formal aspects of the house: a philosophical discourse on the family house in Auckland." MArch diss. University of Auckland, 1970.
- Menges, Achim. *Material computation : higher integration in morphogenetic design*. Chichester: Wiley, 2012.
- Mennan, Zeynep. "The Question of Non Standard Form: a 'Gestalt Switch'." *Architectural Design Research* 2, no. 1 (2007): 137-50.
- Metcalf, Bruce. "Contemporary Craft: A Brief Overview." In *Exploring Contemporary Craft: History, Theory & Critical Writing*, edited by Jean Johnson. Toronto: Coach House Books and Harbourfront Center, 2002.
- Morris, William. *Hopes and fears for art ; and Signs of change*. Bristol: Thoemmes, 1994.
- Murray, Shane. "Architectural Design and Discourse." PhD diss. RMIT University, 2004.
- Pasquarelli, Gregg, Galia Solomonoff, Mario Gooden, Nina Rappaport, and Julia Stanat. *Layered urbanisms*. New Haven: Yale School of Architecture, 2008.
- Pérez Gómez, Alberto, and Louise Pelletier. *Architectural representation and the perspective hinge*. Cambridge, Mass.: MIT Press, 1997.
- Rahm, Philippe. "Form and function follow climate." *AA files* 55, no. 11 (2007): [2]-11.
- Reiser, Jesse, Nanako Umemoto, and Reiser + Umemoto. *Atlas of novel tectonics*. 1st ed. New York: Princeton Architectural Press, 2006.
- Roche, Rebecca Christina. "Bits and pieces: crafting architecture in a post-digital age." MArch diss. RMIT University, 2009.
- Salazar, Jaime. *Verb processing : an expression of states and relations which is inflected, which involves a process shaped by different types of information before, during and after a building is materialized*. Barcelona: ACTAR, 2001.
- Schön, Donald A. *The reflective practitioner : how professionals think in action*. New York: Basic Books, 1983.
- Schumacher, Patrik. *The Autopoiesis of Architecture, Volume II: A New Agenda for Architecture*. Chichester: J. Wiley, 2012.
- . *The Autopoiesis of Architecture: A New Framework for Architecture, Volume 1*. 2 vols Chichester: J. Wiley, 2010.
- . "Style as research programme." In *DRL TEN: a design research compendium*, edited by Tom Verebes. London: AA Publications, 2008.
- Sennett, Richard. *The craftsman*. New Haven, Conn.: Yale University Press, 2008.
- SHoP (Firm). *Versioning : evolutionary techniques in architecture*. London: Academy Editions, 2002.
- Smith, Elizabeth A. T., Julius Shulman, and Peter Gössel. *Case study houses : the complete CSH program 1945 - 1966*. Köln: Taschen, 2002.
- Snooks, Roland. "Behavioral Formation: Multi-Agent Algorithmic Design Strategies." PhD diss. RMIT University, 2014.
- Terzidis, Kostas. *Algorithmic architecture*. Oxford: Architectural, 2006.
- Thompson, D'Arcy Wentworth. *On growth and form*. New ed. Cambridge: Cambridge University Press, 1942.
- Verebes, Tom (ed.). *AADR documents 2: DRL TEN : a design research compendium*. London: AA Publications, 2008.
- Wagener, Wolfgang. *Raphael Soriano*. London: Phaidon, 2002.
- Wardle, J. "Cut threads and frayed ends: the character of enclosure." MArch diss., RMIT University, 2001.
- Weinstock, Michael. *The architecture of emergence : the evolution of form in nature and civilisation*. Chichester, U.K.: Wiley, 2010.
- Weinstock, Michael, Achim Menges, and Michael Hensel. *Emergence : morphogenetic design strategies*. Chichester: Wiley-Academy, 2004.

