

# DRAWING SEEING MAKING

*Or the intangible nature of tangible things*

A thesis submitted to the faculty of the graduate school of the University of Minnesota by  
DAVID WILLIAM VORACHEK LUND  
in partial fulfillment of the requirements for the degree of Master of Architecture.

Advisor, J. Stephen Weeks

JANUARY 2010



## *Acknowledgements*

ARCHITECTURE GRADUATE SCHOOL is an intensely personal and, at times, an insanely selfish grind. Many of the routines in life must be set aside to make time for the effort. For me, a married man, the responsibility of earning a living, the logistics and planning of running a household fell on my wife. The repeated late nights and interrupted weekends were undoubtedly harder on her than on me. Her willingness to carry far more than her share of the load allowed me to pursue my passion, while her calming and insightful mind kept me sane and focused during this project. My deepest thanks and gratitude, Tara, I could have in no way done this without you.

To my professors and fellow students, your

willingness to challenge me and engage in the effort of learning and discovery made this a unique and memorable experience. I have the deepest respect for you all.

To my two former employers and various bosses, whose flexibility and support allowed me to begin preparing for graduate school while remaining gainfully employed.

And to my thesis committee, who supported me, confused me, frustrated me and guided me.

And to Prof. Steve Weeks, Director of Graduate Studies, whose prodding, cajoling and badgering kept me moving, however slowly, until the final submittal.

Thank you all.

# Table of Contents

*Acknowledgements*

PAGE *i*

*Table of Contents*

PAGE *ii*

*List of Figures*

PAGE *iii*

PREFACE

PAGE 1

PART I: THE INQUIRY

*The intangible nature of tangible things*

PAGE 4

PART II: THE SEARCH

*Making marks, seeing, and finding levers*

PAGE 14

PART III: THE RESEARCH

*The gravity of beauty or the power of an object*

PAGE 26

*Drawing Suite 1*

*The Hinge Study - A leveraged artifact*

PAGE 32

*Drawing Suite 2*

*Rowers & Levers - Fulcrum & Compression*

PAGE 42

*Drawing Suite 3*

*Memory & Wake - Of Rhythm & Pattern*

PAGE 68

PART IV: THE PROJECT

*A translation of multiple streams*

PAGE 80

PART V: BIBLIOGRAPHY

PAGE 114

## List of Figures

### INTRODUCTION

[fig. 1] *Rowing Study*, charcoal on paper, 24"x3", pg. 3.

### PART I *The Inquiry*

[fig. 2] *Floor Plan/Section/Elevation*, printmaking ink and pencil on particle board, 17"x11", pg. 6.

[fig. 3] *Floor Plan/Section/Elevation*, printmaking ink and pencil on particle board, 17"x11", pg. 6.

[fig. 4] *Floor Plan/Section/Elevation*, printmaking ink and pencil on particle board, 17"x11", pg. 6.

[fig. 5] *Monoprint*, printmaking ink and oil bar on vellum, 14"x4", pg. 7.

[fig. 6] *Monoprint*, printmaking ink and oil bar on vellum, 14"x4", pg. 7.

[fig. 7] *Elevation*, photoshop photo collage, 17"x6", pg. 9.

[fig. 8] *Floor Plan Perspective*, lightscape image, 17"x11", pg. 10.

[fig. 9] *Hammer*, pencil on paper, Jim Dine, 12"x24", pg. 11.

[fig. 10] *Tree*, mixed media collage, Jim Dine, 12"x18", pg. 12.

[fig. 11] *Elevation*, photoshop photo collage, 17"x6", pg. 13.

### PART II *The Search*

[fig. 12] *Grasslands*, oil bar on drawing paper, 4"x17", pg. 16.

[fig. 13] *Grasslands*, oil bar on drawing paper, 7"x5", pg. 16.

[fig. 14] *Grasslands Butte*, oil bar on drawing paper, 21"x6", pg. 17.

[fig. 15] *Haystacks*, charcoal on drawing paper, 7"x5", pg. 18.

[fig. 16] *Horizon*, charcoal on drawing paper, 7"x5", pg. 18.

[fig. 17] *Prospect*, charcoal on drawing paper, 7"x5", pg. 18.

[fig. 18] *Grasslands Site Study*, pencil and cut paper strip collage, 22"x4", pg. 18.

[fig. 19] *Grasslands Site Study*, mixed media collage on drawing paper, 22"x18", pg. 19.

[fig. 20] *Grasslands Site Study*, oil bar on construction paper, 18"x18", pg. 20.

[fig. 21] *Exterior Elevation Study*, oil bar on vellum, 24"x6", pg. 21.

[fig. 22] *Exterior Elevation Study*, oil bar on vellum, 18"x6", pg. 22.

*List of Figures, continued*

PART III *The Research*

- [fig. 23] *Exterior Elevation & Plan Study*, pencil, colored pencil on trace 17"x11", pg. 23.
- [fig. 24] *Building Section Study*, pencil, colored pencil on trace, 17"x11", pg. 24.
- [fig. 25] *Building Section Study*, pencil and charcoal on photocopy, 24"x8", pg. 25
- [fig. 26] *Hinge Study No. 1*, pencil on paper, 12"x17", pg. 29.
- [fig. 27] *Rowing Study No. 8*, pencil on paper, 12"x17", pg. 30.
- [fig. 28] *Workshop Study*, charcoal on paper, 12"x17", pg. 31.
- [fig. 29] *Hinge Study*, pencil on paper, 18"x12", pg. 33.
- [fig. 30] *Hinge Study*, pencil on paper, 18"x12", pg. 34.
- [fig. 31] *Hinge Study*, pencil on paper, 18"x12", pg. 35.
- [fig. 32] *Hinge Study*, monoprint with printmaking ink on printmaking paper, 12"x18", pg. 36.
- [fig. 33] *Hinge Study*, monoprint with printmaking ink on printmaking paper, 12"x18", pg. 36.
- [fig. 34] *Hinge Study*, monoprint with printmaking ink on printmaking paper, 12"x18", pg. 36.
- [fig. 35] *Hinge Study*, monoprint, printmaking ink on printmaking paper, 18"x12", pg. 37.
- [fig. 36] *Hinge Study*, monoprint, printmaking ink on printmaking paper, 18"x12", pg. 37.
- [fig. 37] *Hinge Study*, monoprint, printmaking ink on printmaking paper, 18"x12", pg. 37.
- [fig. 38] *Hinge Study*, monoprint, printmaking ink on printmaking paper, 18"x12", pg. 37.
- [fig. 39] *Hinge Study*, monoprint, printmaking ink on printmaking paper, 18"x12", pg. 37.
- [fig. 40] *Hinge Study*, monoprint, printmaking ink on printmaking paper, 18"x12", pg. 37.
- [fig. 41] *Hinge Study*, pencil on drawing paper, 18"x12", pg. 38.
- [fig. 42] *Hinge Study*, pencil on drawing paper, 18"x12", pg. 39.
- [fig. 43] *Hinge Study*, pencil on drawing paper, 18"x12", pg. 40.
- [fig. 44] *Hinge Study*, pencil on drawing paper, 18"x12", pg. 41.
- [fig. 45] *Rowing Study*, pencil on paper, 18"x12", pg. 43.
- [fig. 46] *Rowing Study*, pencil on drawing paper, 18"x12", pg. 44.
- [fig. 47] *Rowing Study*, pencil on drawing paper, 18"x12", pg. 45.
- [fig. 48] *Rowing Study*, pencil on drawing paper, 18"x12", pg. 46.

## *List of Figures, continued*

### *PART III The Research, continued*

- [fig. 49] *Rowing Study*, pencil on drawing paper, 18"x12", pg. 47.
- [fig. 50] *Rowing Study*, pencil on drawing paper, 24"x4", pg. 48.
- [fig. 51] *Rowing Study*, pencil on drawing paper, 24"x4", pg. 48.
- [fig. 52] *Rowing Study*, monoprint, printmaking ink on printmaking paper, 14"x12", pg. 49.
- [fig. 53] *Rowing Study*, monoprint, printmaking ink on printmaking paper, 14"x12", pg. 50.
- [fig. 54] *Rowing Study*, monoprint, printmaking ink on printmaking paper, 14"x12", pg. 51.
- [fig. 55] *Rowing Study*, monoprint, printmaking ink on printmaking paper, 14"x12", pg. 52.
- [fig. 56] *Rowing Study*, monoprint, printmaking ink on printmaking paper, 14"x12", pg. 53.
- [fig. 57] *Rowing Study*, monoprint, printmaking ink on printmaking paper, 14"x12", pg. 54.
- [fig. 58] *Rowing Study, Mechanics and Force*, pen and ink on drawing paper, 17"x11", pg. 55.
- [fig. 59] *Rowing Study, Mechanics and Force*, pen and ink on drawing paper, 17"x11", pg. 56.
- [fig. 60] *Rowing Study, Mechanics and Force*, pen and ink on drawing paper, 17"x11", pg. 57.
- [fig. 61] *Rowing Study, Mechanics and Force*, pen and ink on drawing paper, 17"x11", pg. 58.
- [fig. 62] *Rowing Study, Mechanics and Force*, pen and ink on drawing paper, 17"x11", pg. 59.
- [fig. 63] *Rowing Study, Mechanics and Force*, pen and ink on drawing paper, 17"x11", pg. 60.
- [fig. 64] *Rowing Study, Mechanics and Force*, pen and ink on drawing paper, 17"x11", pg. 61.
- [fig. 65] *Rowing Study, Mechanics and Force*, pen and ink on drawing paper, 17"x11", pg. 62.
- [fig. 66] *Rowing Study, Mechanics and Force*, pen and ink on drawing paper, 17"x11", pg. 63.
- [fig. 67] *Rowing Study, Connection and Elongation*, pencil on drawing paper, 17"x11", pg. 64.
- [fig. 68] *Rowing Study, Connection and Elongation*, pencil on drawing paper, 17"x11", pg. 65.
- [fig. 69] *Rowing Study, Connection and Elongation*, pencil on drawing paper, 17"x11", pg. 66.
- [fig. 70] *Gondola/Site Study, Venice Italy*, pencil on drawing paper, 8"x6", pg. 67.
- [fig. 71] *Catch and Recover No. 1*, map of a rowing stroke, charcoal on paper, 17"x14", pg. 69.
- [fig. 72] *Catch and Recover No. 2*, printmaking ink on printmaking paper, 14"x11", pg. 70.
- [fig. 73] *Catch and Recover No. 3*, map of a rowing stroke, charcoal on paper, 17"x14", pg. 71.
- [fig. 74] *Catch and Recover No. 3*, map of a rowing stroke, pencil on paper, 17"x14", pg. 72.

## *List of Figures, continued*

### *PART III The Research, continued*

- [fig. 75] *Catch and Recover No. 4*, map of a rowing stroke, pencil on paper, 17"x14", pg. 72.
- [fig. 76] *Study of Rhythm, A move from Movement to Form*, pencil on drawing paper, 17"x11", pg. 73.
- [fig. 77] *Study of Rhythm, A move from Movement to Form*, pencil on drawing paper, 17"x11", pg. 74.
- [fig. 78] *Study of Rhythm, A move from Movement to Form*, pencil on drawing paper, 17"x11", pg. 75.
- [fig. 79] *Study of Rhythm, A move from Movement to Form*, pencil on drawing paper, 17"x11", pg. 76.
- [fig. 80] *Study of Rhythm, A move from Movement to Form*, pencil on drawing paper, 17"x11", pg. 77.
- [fig. 81] *Rowing/Workshop Study*, pencil on paper, 17"x11", pg. 78.
- [fig. 82] *Rowing/Workshop Study*, pencil on paper, 17"x11", pg. 79.

### *PART IV The Project*

- [fig. 83] *Rowing Study*, pencil on drawing paper, 18"x6", pg. 82.
- [fig. 84] *Rowing Study*, printmaking ink on print making paper, 12"x14", pg. 83.
- [fig. 85] *Scull*, photo courtesy of Eric Whittington, pg. 84.
- [fig. 86] *Rigger's Bay at the Cambridge Rowing Club*, photo courtesy of Eric Whittington, pg. 85.
- [fig. 87] *Building Study, Peter Zumthor's Vals Baths, Vals, Switzerland*, hybrid drawing, computer graphic, 17"x4", pg. 91.
- [fig. 88] "Erg" *Study*, pencil on paper, 14"x11", pg. 93.
- [fig. 89] *Context Plan*, underlay, oil bar and colored pencil on paper; overlay, scanned site plan, 36"x28", pg. 95.
- [fig. 90] *Site Section at Lake Street Bridge*, oil bar and colored pencil on drawing paper, 24"x16", pg. 96.
- [fig. 91] *Site Elevation*, printmaking ink on printmaking paper, 17"x14", pg. 97.
- [fig. 92] *Outlines*, printmaking ink on printmaking paper, 14"x11", pg. 98.
- [fig. 93] *Regatta*, printmaking ink on printmaking paper, 14"x11", pg. 98.
- [fig. 94] *Hinge Study*, printmaking ink on printmaking paper, 9"x12", pg. 99.
- [fig. 95] *Hinge Study*, oil bar and charcoal pencil on paper, 18"x24", pg. 99.
- [fig. 96] *Hinge Study*, printmaking ink on printmaking paper, 9"x12", pg. 99.
- [fig. 97] *Rotation Prints, No. 2 of 10*, printmaking ink on paper, 17"x14", pg. 100.
- [fig. 98] *Rotation Prints, No. 3 of 10*, printmaking ink on paper, 17"x14", pg. 100.

*List of Figures, continued*

PART IV *The Project, continued*

- [fig. 99] *Rotation Prints, No. 4 of 10*, printmaking ink on paper, 17"x14", pg. 100.  
[fig. 100] *Rotation Prints, No. 5 of 10*, printmaking ink on paper, 17"x14", pg. 100.  
[fig. 101] *Conceptual Model*, cardboard and basswood, not to scale, pg. 100.  
[fig. 102] *Light and Shadow Study Models*, cardboard and basswood, not to scale, pg. 101.  
[fig. 103] *Workshop Study*, charcoal on paper, 11"x17", pg. 102.  
[fig. 104] *Boathouse Study*, pencil on paper, 17"x11", pg. 103.  
[fig. 105] *Rigger's Bay Detail*, pencil on paper, 17"x11", pg. 104.  
[fig. 106] *River Elevation*, material description, 17"x11", pg. 105.  
[fig. 107] *Land Elevation*, pencil on paper, 17"x11", pg. 105.  
[fig. 108] *Workshop Study*, pencil on paper, 17"x11", pg. 106.  
[fig. 109] *Workshop Study*, pencil on paper, 17"x11", pg. 106.  
[fig. 110] *Floor Plan*, pen on paper, 17"x11", pg. 107.  
[fig. 111] *Study Model*, cardboard and basswood, scale: 3/32" = 1'-0", pg. 108.  
[fig. 112] *Study Model*, cardboard and basswood, scale: 3/32" = 1'-0", pg. 109.  
[figs. 113 thru 115] *Study Model*, cardboard and basswood, scale: 3/32" = 1'-0", pg. 110.  
[figs. 116 thru 124] *Study Model Details*, cardboard and basswood, scale: 3/32" = 1'-0", pg. 111.  
[fig. 125] *Study Model*, boatbuilder's workshop as seen from the river, scale: 3/32" = 1'-0", pg. 112.  
[fig. 126] *Final Study*, pen and pencil on trace, 17"x11", pg. 113.

# Preface

I MAINTAIN THAT THIS THESIS IS a compelling way to explore and communicate the role of representation in architecture. There is a real and distinct possibility, however, that this method of inquiry may not yield the rich results I expect but, instead, serve only to confuse and obfuscate the design process. My belief is that this will not be the case. But in all honesty, I do maintain a slight sense of unease and uncertainty about this process and its ability to unearth and propel architectural ideas. Ultimately this effort is about translating personal discovery into universal understanding. This is, after all, still a search for what's plausible.

## A PROGRAMMATIC SHIFT

A note on the programmatic shift in the thesis. Initially the project scope was more ambitious. It was larger and more expansive, that of a nearly 12,000 sq. ft. boathouse for a large regional rowing club located on the banks of the Mississippi above St. Anthony Falls. The programmatic description, in its original form, is retained in PART IV. There is a textural note preceding the programmatic description rearticulating this change. The initial scope was the by-product of a

written effort, produced independently from any drawing. The result was premature.

Interestingly enough, it was the act of drawing that exposed the limits of an over-sized and overly ambitious programmatic premise. As the drawing effort ramped the project jumped the tracks. It was soon revealed that as originally conceived the thesis would become a slave to cumbersome even arbitrary programmatic requirements. And so it was changed. This change was more a response to the time constraints of the thesis semester than the proposed process of inquiry.

What seemed more appropriate was a smaller and more intimate programmatic outline, one that allowed the focus to remain on the discoveries attached to the drawing, not on fulfilling criteria. The programmatic scope was narrowed and simplified to that of a boat builder's workshop for a single craftsman. It is a small space. A sacred space. A quite space. It might even be said that the focus of the thesis is not truly a boathouse, but the *idea* of boathouse, or the *idea* of rowing, or the *idea* of water. And, in the end, it proved that it need not even result in a completed building, but instead multiple lines of inquiry.

As mentioned, this programmatic shift is

the first and perhaps most dramatic evidence of the role of drawing to influence and guide the design effort. Although the direction of the thesis has been altered, the decision was made to keep the original language in the thesis document. It serves now as a record or map of how deeply early drawing efforts changed the direction and nature of the thesis.

So, what exactly is the nature of this thesis? At its core, it is the same issue that has driven much of my graduate school experience - how to find ideas through image making. It is about the Search. A Search through drawing for Essence and Element. The attempt is to reveal and maybe even identify the intangible yet visceral nature of Things, of Body, of Movement, of Leverage, of Effort and of Gravity. Through drawing, a conceptual framework is established within which ideas are developed and tested.

#### NEXTTEXT AND REPRESENTATION

The exact focus of this thesis and its specific positions will be covered in much greater depth over the following pages, but an aid must be offered on how this work may be read. The written structure of this thesis is of parallel or co-equal paths of

inquiry - a primary text and a complimentary sub-text. The primary narrative text is accompanied by a companion piece, the *Notes*.

In mass, they make up slightly less than half of the written portion of this thesis. I have used them as co-text, a narrative that runs outside of and beyond the narrower focus of the main inquiry. They are more informal in tone and provide background information on the inspiration or influence of ideas and topics of interest to me. Their writing is an act of incorporation that hopes to give this work greater density and scope. The notes can be ignored without any loss of clarity or insight into the thesis; they can be occasionally sampled, augmenting certain portions that are of greater interest to the reader; or they may be consumed whole. My hope, of course, is for the latter.

#### GRAPHIC CHAPTERS

PART I explores the notion of Essence. What is the nature of an object? What are the intangible qualities of Things and how might they be found and used to spur ideas of building and architecture. PART I is the foundation and explication of the thesis and remains the backdrop against which all drawings are viewed.

The images shown are taken from a GDII design studio that explored the nature of Beauty.

PART II is a distillation. My first two years of graduate school (as well as my previous career as a graphic designer) were largely devoted to the exploration of image making with the intent to find hidden meaning and a deeper design language. Certainly composition and balance are important elements in design, but they serve a different master. This chapter focuses less on formal construction and more on the experiential and tactile nature of drawing - the nubby pull of a pastel, the dusty trail of a charcoal stick, the soft spread of a lead pencil, or the stick and snap of printmaker's ink. It focuses on the search and hunt for meaning by combing through the latent intellectual residue left behind by the act of making marks on a page. Hence the title *Draw, See, Make*.

The images used to highlight this notion were taken from a week-long trip at the beginning of a GDIII design studio to the Buffalo Gap National Grasslands in south western South Dakota. More than any effort this drawing set - done almost exclusively in the field - genuinely attempted to put on paper that which could only be experienced. Set against the backdrop of 9/11, this rarified moment in time proved to be one of



[fig. 1] *Rowing Study*, charcoal on paper, 24"x3"

my most fruitful in graduate school.

PART III outlines the broad parameters of the three main drawing studies and seeks to highlight and map the representational linkage between drawing efforts. Though each collection of images comprises a separate and distinct drawing inquiry, the intent is that each suite inform the others. Each series stands as a graphic chapter to which subsequent efforts respond. One collection serves as counterpoint and source book for the other collections.

More specifics on the role and types of drawings also is discussed in PART III.

Each thetic statement needs to be tested. If not, all that remains is a well considered project. PART IV is the test of multiple design threads. No single, completed project resulted from this effort; rather, numerous paths were suggested of which one of the most fruitful was selected.

PART IV also outlines the scope of the design effort. It is the most asymmetrically balanced portion of the thesis, with the bulk of the text residing in the *Notes*. There is a reason for this. The scope of the original program was researched and written in the fall semester, previous to the start of the drawings. Once the drawing began, it

became evident that the program was too large and cumbersome to reasonably accommodate the allotted time frame. In addition to the time constraint, the hinge drawings suggested something more intimate. The result moved away from a larger boathouse and toward a smaller boat builder's workshop, a riverside chapel, of sorts.

This modification was supported by my thesis committee. I am grateful for their input and guidance on this matter, as it allowed for a richer and more concentrated thesis project. Rather than removing the original programmatic narrative from the thesis, it has been relocated to the *Notes*.

# PART I: THE INQUIRY

*The intangible nature of tangible things*

*“It’s just a way to begin, a way of making a specific mark rather than an unspecific mark,  
but I really don’t know what will happen each time .”*<sup>1</sup>

JIM DINE  
Contemporary American Artist

THIS THESIS TAKES A SIMPLE YET elusive position. Through the unique act of drawing, we can discover, capture, even manipulate the intangible nature of tangible things. The *possibility* of this thesis exists in the effort of making marks on a page. The relevance of drawing in architecture is its ability to access and root itself in the intangible nature of Things and, in turn, to suggest possibilities that lie beyond the Thing itself.

#### REFERENT

This is a crucial point and one that establishes this

thesis’s relevance to architecture. The power of architecture, like that of drawing, is its ability to reveal deeper meanings. Drawing, by its very nature, is best suited to reveal the intangible qualities of architecture.

Exploring the realm of the intangible through the medium of drawing is an effort as concerned with the *making* of a drawing as with the *appearance* of the thing drawn. In the making of the drawing an image is created that acts essentially as a substitute, a referent that can be matched with other ideas, notions, or possibilities. By mak-

ing a drawing of a building, we are empowered to consider the larger *idea* of building. A drawing of a door hinge, for example, is never believed to be an actual door hinge. But by making the drawing we can contemplate the idea of Hinge. The drawing becomes a substitute for the Thing and becomes a referent to a larger idea.<sup>2</sup>

Every act of representation, than, is an act of idea generation or design modification. The dynamic of this relationship is familiar territory for most architects and designers and one that may be even second nature. It is the architect’s

responsibility to leverage the substitute into the idea.

This example can be taken a step further. The proposition - that making a drawing of an object or artifact - can lead not only to ideas about the intangible nature of the object, but also to larger ideas about building and architecture. In fact, these larger ideas may not be directly linked to the artifact itself. Successful working drawings become uncoupled from the limits of appearance and are released from what is known and begin to

function as surrogates for larger ideas.

The idea that drawings have external references is the key criteria by which an architectural drawing can be determined to be successful. The moment a drawing transcends the object and begins to be about things not drawn, about conditions beyond the image, is the precise moment a drawing begins to work.

The word *work* is chosen deliberately. When a drawing captures and reveals the intangible nature of things it functions as a catalyst, as a pro-

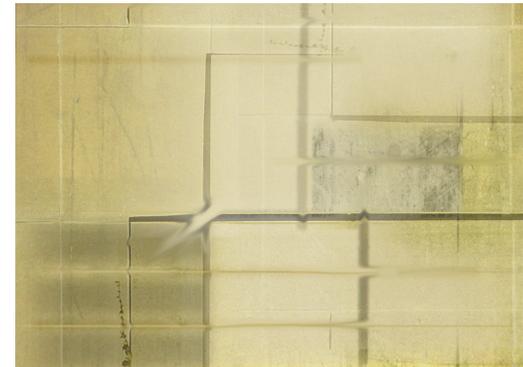
pellant and as a laborer. The drawing immediately becomes the antecedent for subsequent ideas and a repository for meaning. It is at this point that drawing is at its most potent, for this is when the qualities of time and history enter in. There is now a growing sense of something experienced or of something yet to be. The drawing now exists along a spectrum of time. By their very presence, these traits introduce into the drawing the notions of past, present, and future. The drawings' relevance is extended and amplified. Able to shift between



[fig. 2]



[fig. 3]



[fig. 4]

[figs. 2 thru 4] *Floor Plan/Section/Elevation*, printmaking ink and pencil on particle board, 17"x11"

*Visual Acuity: This series of images was created with the specific intent that they were "source material", drawings from which other drawings could be pulled. These are the first generation antecedents to the multiple iterations that followed. They were drawn to be read simultaneously as plans, sections or elevations.*



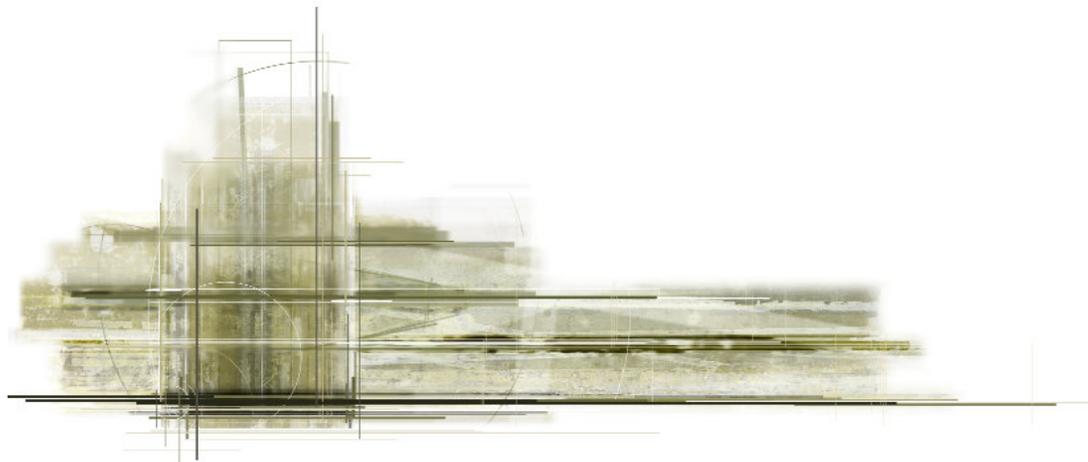
[fig. 5] *Monoprint*, printmaking ink and oil bar on vellum, 14"x4"

past and present, working in both directions, the drawing becomes ancestor as well as progeny, antecessor as well as scout.

The elusive conditions of duality and simultaneity are found at the heart of a successful drawing [figs. 2 thru 4]. There is now the suggestion of an earlier life and future possibilities. If a drawing can no longer be pinned down to a specific place and time, the making of the drawing has taken us beyond the object and we actually no longer see the thing. The noun has been transformed into verb. Or more accurately, the drawing is simultaneously noun and verb.

A drawing is both invention and verdict. It is to have seen things and to have made judgments. Drawings are embedded with meaning, ideas, and experience. The drawing, however, is not the thing; the idea is the thing. Drawing in

architecture, unlike drawing in the arts, is not an end in itself; rather, it is always an allusion to something else - to an other. Even construction documents, despite their precise and comprehensive appearance, are not ends in themselves; they



[fig. 6] *Scanned in to the computer, fig. 5 now serves as a background layer, upon which simple lines and shapes are drawn. Still gestural in nature, a greater degree of specificity is established based on forms and textures found in the original drawing.*

are suggestive and referential guides for a building that is to become. The power of beautifully detailed construction documents lies not in their apparent completeness, but in their allusion - to the nature of materials, to connections, and to dynamically balanced forces. The longer a drawing's meaning remains elusive and mercurial, the greater the opportunity for it to articulate and generate possibilities [figs. 5 & 6]. If the drawings are unattached to larger architectural issues they run the risk of being only aesthetic objects. Pieces that refer only to themselves limit possibilities and become simple reductions. This thesis pursues work that is instead expansive and above all artful.

An example of this notion can be found in Italian Renaissance history, in a famous story involving Michelangelo and cadavers. Wanting to better understand how the human body was structured, wanting to examine the elements that give humans their form - muscle, tendon and bone - Michelangelo turned to the dissected bodies found in the morgue.

He gained forbidden access to the mortuary by befriending a monk who worked in the morgue. Night after night, by candle light, Michelangelo would sketch the subjects offered by the morgue. He would spend his nights alone in the mortuary drawing cadavers, that in preparation for burial, had been laid bare. At the time, the only ones sanctioned to work with the dead were the priests and monks of the Catholic Church. If discovered, Michelangelo ran the very real risk of being punished by the Church, of even being excommunicated. But Michelangelo understood the value in such studies, so much so, he was willing to gamble his livelihood and future as an artist.<sup>3</sup> One has only to see the remarkable figure drawings of Michelangelo to realize that by drawing the human form, he was *seeing* and *understanding* the human form and, at the same time, he was exploring the intangible nature of the body.

The sole beneficiaries of this knowledge were not strictly his paintings and sculptures. His architecture, as well, reveals a deep understanding of scale, structure, and proportion, all of which is anchored to his understanding of the human form. By drawing the body, he saw *possibilities* in architecture. This drawing inquiry is done with the same motive and intent. By drawing the Thing, the hope is to better understand the nature of the Thing.

#### INTERPRETATION

Why attempt to make pictures that seek the essence of a Thing? Wading into the realm of the elemental and the non-verbal is an attempt to carve out space for judgement, to allow for interpretation and ultimately to search for meaning and beauty. It is a way to make room.

Using drawings as fodder for the generation of ideas is a unique provenance of architecture and one of the few things it does better than any other discipline. Karsten Harries, in *Representation and Representation in Architecture*, claims that to understand how architecture is distinct from building it must be read. To understand a building it must be interpreted. A stance must be taken.<sup>4</sup> Eliminating the role of interpretation removes any chance for

meaning and by extension the possibility for Architecture.

The benefits of this position are not simply limited to the generation of a conceptual framework for building and design. In fact, what might be the most powerful result of this examination is that it serves as a point of entry into a better understanding of the nature of Architecture. Is it plausible that the discipline of architecture can be better understood through the making of drawings? Perhaps as architects, in our efforts to design, what we are truly discovering is not building, but the nature of Architecture.

A similar notion underlies Louis Kahn's idea that every piece of architecture is an offering to Architecture.<sup>5</sup> Every attempt, every effort to make a drawing or a piece of architecture brings us closer to the essence of our discipline.

Earlier, the word *invention* was used when talking about the nature of drawing. This is an important consideration, for it reveals the role of human judgement and explication inherent in the drawing process. When drawing, the designer is several layers removed from reality. Again, use the door hinge as an example. When drawing the door hinge, the original concept of a door hinge is not being drawn. The original conception of the door

hinge was brought into being by either a metal-smith or, more likely today, a machine. What actually is drawn is the *appearance* of a particular *instance* of door hinge (this is the condition described earlier when drawings were said to be referents to an idea).<sup>5</sup>

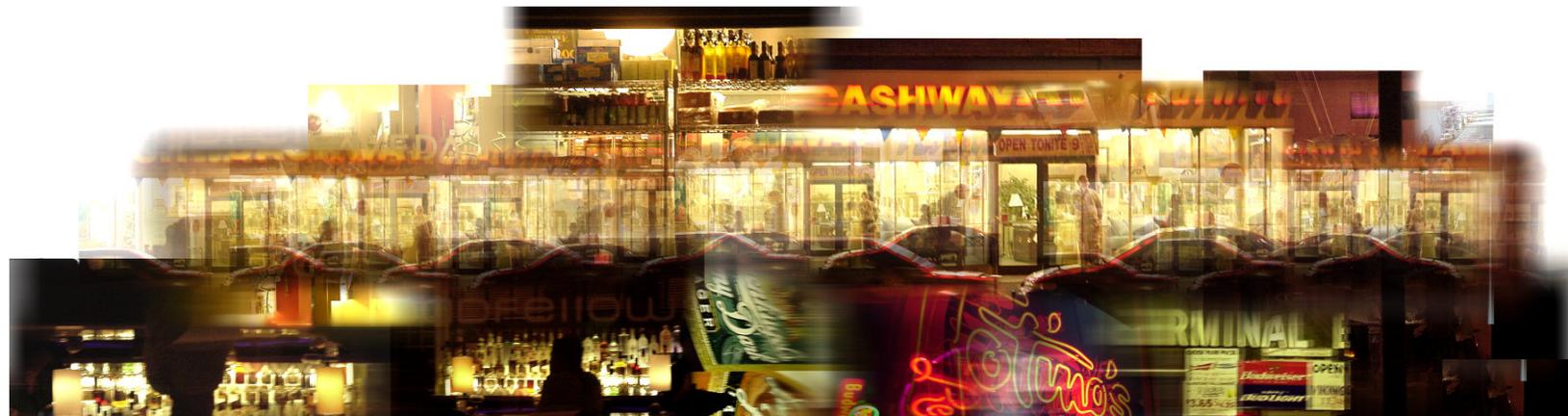
A value judgement is not being made as to whether this makes drawing better or worse than other modes of representation, but this *separation* from the thing being drawn is precisely the reason why drawing demands invention and intervention. The gaps must be filled. When drawing, we are

engaged in either a prodigal act of return - a look backwards in an attempt to recapture the initial conception or essence of the thing being drawn - or in a new act of invention that moves us even further away from the original concept of the object. Either way, the movement and momentum of the drawing is the result of invention.

The making of buildings is neither a simple nor a casual affair. Whether the specific act of making drawings - even drawings not directly about building - can lead to ideas about architecture brings up an important question: where do

ideas come from? This thesis claims ideas are generated through the act of *making* and *interpreting* images. Taken to the extreme, the drawings could be about any subject. Again, it is not the subject of the drawing inquiry that is of importance; instead, it is how a drawing can be used as a lever or a tool to find or even to capture an object's intangible nature that is vital.

Inherent in this position, however, is the understanding that the drawings are to be read and interpreted through the filter of architecture [fig. 7]. The drawings may suggest many things when



[fig. 7] *Elevation*, photoshop photo collage, 17"x6"

*As a generative drawing, ultimately architectural ideas surface that must be tested - for form, space and materiality - otherwise, the drawing is only an exercise in image making.*

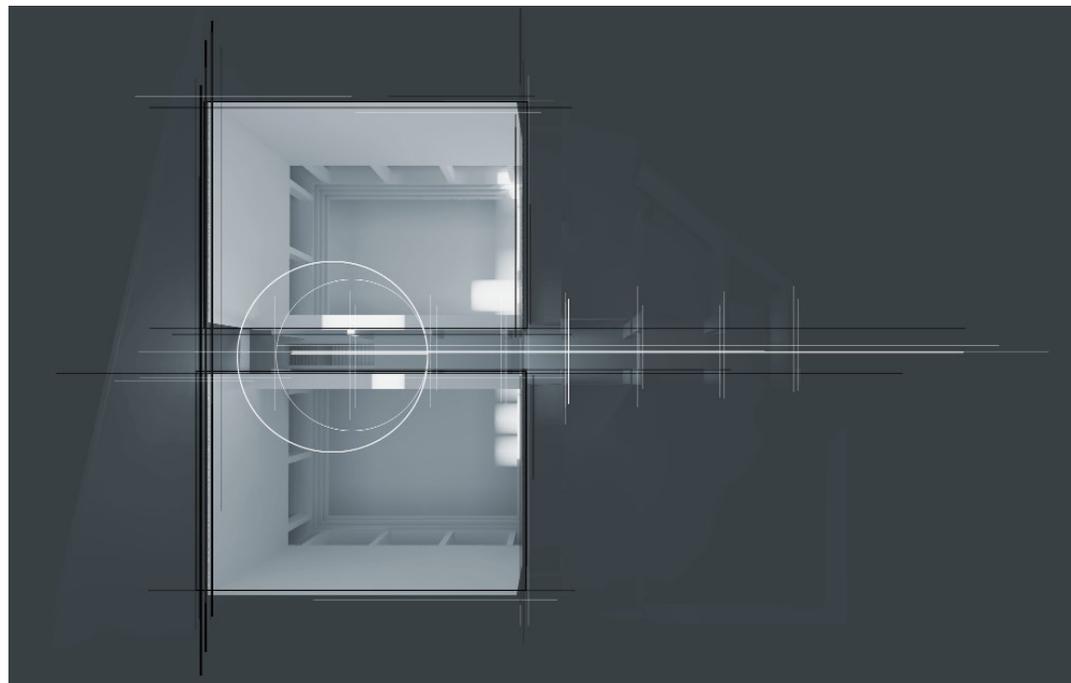
looked at from various points of view, but this thesis is only interested in what they might have to say about building.

#### INTELLECTUAL ENGAGEMENT

This previous notion is purely an intellectual construct, a way to think about the ramifications of making a drawing. There is another crucial component of drawing to be considered, however. It is the *act* of making marks, the physical manifestation of intellectual engagement. There is a demand while drawing that one be present. Drawing is neither a passive nor a mechanical process and judgements are continuously being made as to the quality, density, variety or paucity of marks made on the page. Decisions, many made

within fractions of a second, are the result of sensual communication between the mind, the eye, and the hand, in direct response to the developing drawing. It is a conversation that seeks to balance multiple considerations, multiple possibilities. There seems to be a certain correlation between a successful drawing's richness and the number of senses employed, both in the making and the subsequent viewing.

But what must be stressed is the role of making the mark on the page. The act of marking, the act of making is also an act of claiming.<sup>6</sup> Something tangible has begun, something to be refuted or amplified. By making we gain access to the world of ideas and establish a position from which a point of view may emerge. But all of the latent potential in drawing is contingent upon first making a mark. I am reminded of something my



[fig 8] *Floor Plan Perspective, lightscape image, 17"x11"*  
*Through the reading and interpretation of repeated drawings decisions are made and choices are pursued that provide the frame work for a more formal and structured drawing and design effort. However, even at this point in the design/drawing process an attempt is made to keep the drawings "open" for further interpretation.*

father told me about running your own business, “If you don’t work, you don’t get paid”. You must first make marks, only then might you be rewarded for the effort.

#### WHY DRAWING?

So why drawing? Why not photography? Why not computers or even intellectual discourse as a way to generate ideas? What characteristics favor the technique of drawing as a method of discovery?

The role of representation in architecture is not singular, neither in manner nor in intent. Drawings used as a way to generate ideas are quite different in method from drawings used to communicate what is known. The first can be a very solitary and personal process, an architect’s internal dialog with the world. While the intent of the second is about naming, recording and communicating that which has been understood or solved [fig. 8].

How might the process differ if one were to focus on photography, for example, as the method for generating ideas? With drawing, unlike photography, there is no point at which the artist stops making, where a mechanical operation intervenes and completes the task. While establishing a shot, the photographer repeatedly balances the oppor-

[fig. 9] *Hammer*, pencil on paper, Jim Dine, 12”x24”

tunities of the scene with the eye’s ability to compose and frame the subject. Like drawing, there is a dialog, but once resolved, the photographer backs away, disengages, stops making decisions and snaps the shot, mechanically capturing and freezing the moment. And photographs are precisely that, moments. Samples and slices of brief, at times powerful and poignant, arrested moments. As viewers of the images we must fit



within the parameters established by the photographer. Oftentimes, one of the most compelling questions to consider when looking at photographs is what action falls outside of the framed image. What do we *not* see? What happened before the shot was taken; what happened next? The suggestive power of a photograph is often linked to what is edited, cropped out, and absent. Drawings, stimulate by what is present.



[fig 10] *Tree*, mixed media collage, Jim Dine, 12"x18"

## Notes

1. Talking about the making of his own textured images [figs. 9 & 10], Jim Dine expresses quite simply that which I have spent pages trying to articulate - drawing's remarkable capacity to cross-pollinate ideas and its power to influence decisions made in other areas. But what is the most striking point for me, is the trust he has in the creative process and his willingness to allow and to not restrict the fluidity of understanding and discovery.

2. The idea that a drawing is a substitute for the thing and reference an idea must be taken further. Douglas Cooper, in his book *Drawing and Perception*, talks about a drawing's power over the reference:

"A drawing of a building must enable an architect to build, tear down, and rebuild (with graphite and paper) the interim solutions that a client could not afford to build if they were executed in real bricks and

mortar."

*We cannot become hostages to the images or to their beauty. They are, instead, mediums.* *Drawing and Perception*, p. 105.

3. Beyond the spiritual ramifications of possible excommunication, there existed another very grave consequence for Michelangelo if he were to be discovered drawing in the morgue. It's well understood that the Catholic Church was the primary patron of the arts in renaissance Italy. As an artist whose livelihood depended upon churchly commissions, Michelangelo was jeopardizing the one relationship that was most important to him as an artist. Without the Church, he ceased to function as an artist. But whatever insight he gained as an artist we gained as a culture.

4. Despite its title, Karsten Harries' focus in *Representation and Re-Presentation in Architecture* is not so much on the role of drawing or representation in architecture, but on what distinguishes building from architecture. To reveal what the "more" is that the architect does, Harries examines the notion of aesthetic appeal in architecture. In an earlier paper on this subject I wrote:

"To do this Harries uses Pevsner's definition of aesthetic appeal. Pevsner claims that architecture is different from building

because 'it is designed with a view to aesthetic appeal.' Every object can be experienced aesthetically. Objects must be perceived simply by looking. There is to be no association or connection with anything external. It must be unlinked from intruding intellectual and emotional references. (Heidegger would object to this notion for it removes the understanding of things from the fourfold). Summing up the notion, Harries says, 'a pure

aesthetic object should not mean, but be.' At its surface this seems plausible - to understand something we must perceive only that thing. But what do we perceive when we only see the thing? Without context or connection we are limited to disconnected qualities of surface."

*Paper 2: Phenomenal Integration, written for Principles and Theory of Design, Arch 5411. Prof. Cynthia Jara, University of Minnesota, November, 1999.*

*Harries' writings have had a large impact on my position that successful architecture always gestures beyond itself. In fact, Harries' contention that what distinguishes architecture from mere building is its ability to be read, to be interpreted [fig. 11], leads quite naturally to the notion of an architectural language. This is a large and complicated topic, one beyond the scope of even these notes, but the idea that drawing might function as an architectural language is a compelling notion.*



[fig. 11] *Elevation*, photoshop photo collage, 17"x6"

# PART II: THE SEARCH

*Making marks, seeing, and finding levers*

*“The search is what everyone would undertake if he were not stuck in the everydayness of his own life.  
To be aware of the possibility of the search is to be onto something.”<sup>1</sup>*

WALKER PERCY  
“The Moviegoer”

THIS THESIS IS ABOUT THE SEARCH, about being onto something and seeking a dialog with that thing. It is about meeting that thing and returning to it - a repeated encounter and a developed position.

Since I can remember, I have been fascinated by the discovery and articulation of the essence of things, of people, of artifacts. I see it as finding the voice of the non-verbal, making tangible that which prefers to be intangible.

The 20th century French painter and teacher Robert Henri states in the book, *The Art*

*Spirit*, “a drawing should be a verdict. Yours should be the drawing of strong intentions. Every line should carry a thousand pounds.” This is a wonderful way to express the idea of a drawing carrying meaning.

During much of 20th century Modernism, architectural drawings were seen as verdicts. Drawings were pronouncements and declarations that could (with the help of new machines) move mountains, or at least bore through them. This was, after all, the age of the manifesto.<sup>2</sup>

An architect whose ideas greatly shaped the

manifesto spirit in architecture, LeCorbusier claims in *Towards a New Architecture* that:

*To make a plan [drawing] is to determine and fix ideas. It is to have had ideas. It is so to order these ideas that they become intelligible, capable of execution and communicable. It is essential therefore to exhibit a precise intention, and to have had ideas in order to be able to furnish oneself with an intention.*

My contention is that, although there are many layers in the process, architectural represen-

[fig. 12 ] *Grasslands*, oil bar on drawing paper, 4"x17"

tation has traditionally served two primary functions. One is the pursuit of the intangible. It is the effort to see and to capture through architectural means the nature of an experience, place, or condition. This is an elemental effort - it is the designer in conversation with the world [figs. 12 thru 14]. It is an attempt to see. The representation process serves as a mediator or filter through which architects see the world.

The other function representation fulfills is to communicate a physical, dimensional, and material reality. To turn idea into building. But in truth, even presentation drawings and construction documents are interpretations. They are deceptions, for they present as tangible and known that which is still only imagined. Rarely,



*One of the most compelling grassland conditions was the relationship of land to sky. Laying down in the grass the air was calm, warm, even moist. A strong sense of protection. Standing up, however, the wind was strong and cold. The eye turned up to the sky and you felt exposed and vulnerable.*

[fig. 13 ] *Grasslands*, oil bar on drawing paper, 7"x5"



however, does the building fulfill the promise of the drawing.

What I propose is a thesis inquiry that seeks, through drawing, the condition of the intangible. The effort has two vital components. They must be seen as simultaneously separate, yet seminally linked endeavors. The potential inherent in this search is how these two bodies of information inform each other and how they merge and impact design decisions.

The first drawing effort is the drawing study of the door hinge. This is covered in greater depth

in Part III, *Drawing Suite 1*. I will leave further description of this effort for that section.

The second component of the drawing effort is the subject of the remaining portion of Part II. It is very different in focus and scope than the hinge study. It is a much broader and less clearly defined effort. But the two studies are critically linked.

Perhaps the most powerful metaphor that best illustrates this thetic structure is the basic genetic model of DNA. It's an elegant and efficient relationship consisting chiefly of two indi-

vidual strands of nucleic acids, that when linked together, generate life and transmit elemental physical characteristics. This is the working model that guides my drawing inquiry.

#### BUFFALO GAP NATIONAL GRASSLANDS

As mentioned in the preface, the images used to highlight this notion of making tangible that which is intangible are taken from a week-long trip at the beginning of a GDIII design studio to the Buffalo Gap National Grasslands in western South Dakota. More than any other grad school



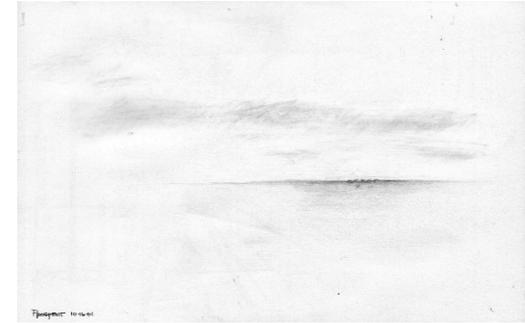
[fig. 14] *Grasslands Butte*, oil bar on drawing paper, 21"x6"



[fig. 15 ] *Haystacks*, charcoal on drawing paper, 7"x5"



[fig. 16 ] *Horizon*, charcoal on drawing paper, 7"x5"



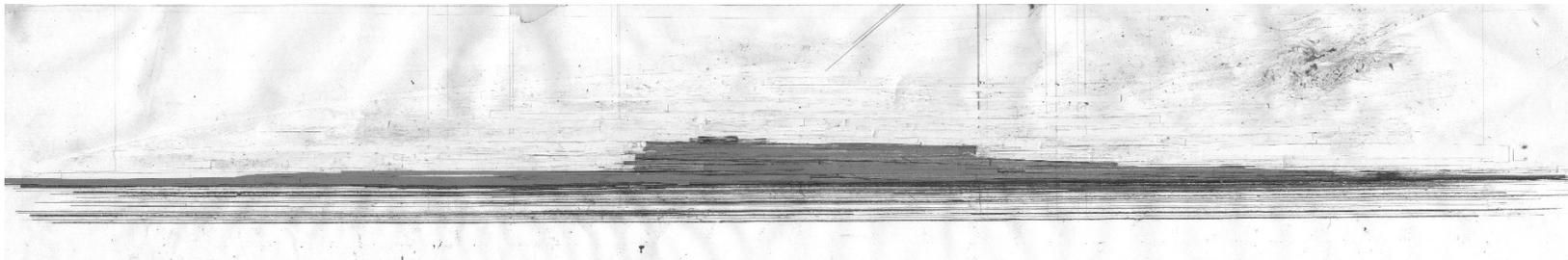
[fig. 17 ] *Prospect*, charcoal on drawing paper, 7"x5"

effort, this drawing set - done primarily in the field - genuinely attempts to put on paper that which can only be experienced or sensed.

The sensual elements of wind, temperature, sky, calm, vast open expanses, grasslands severed

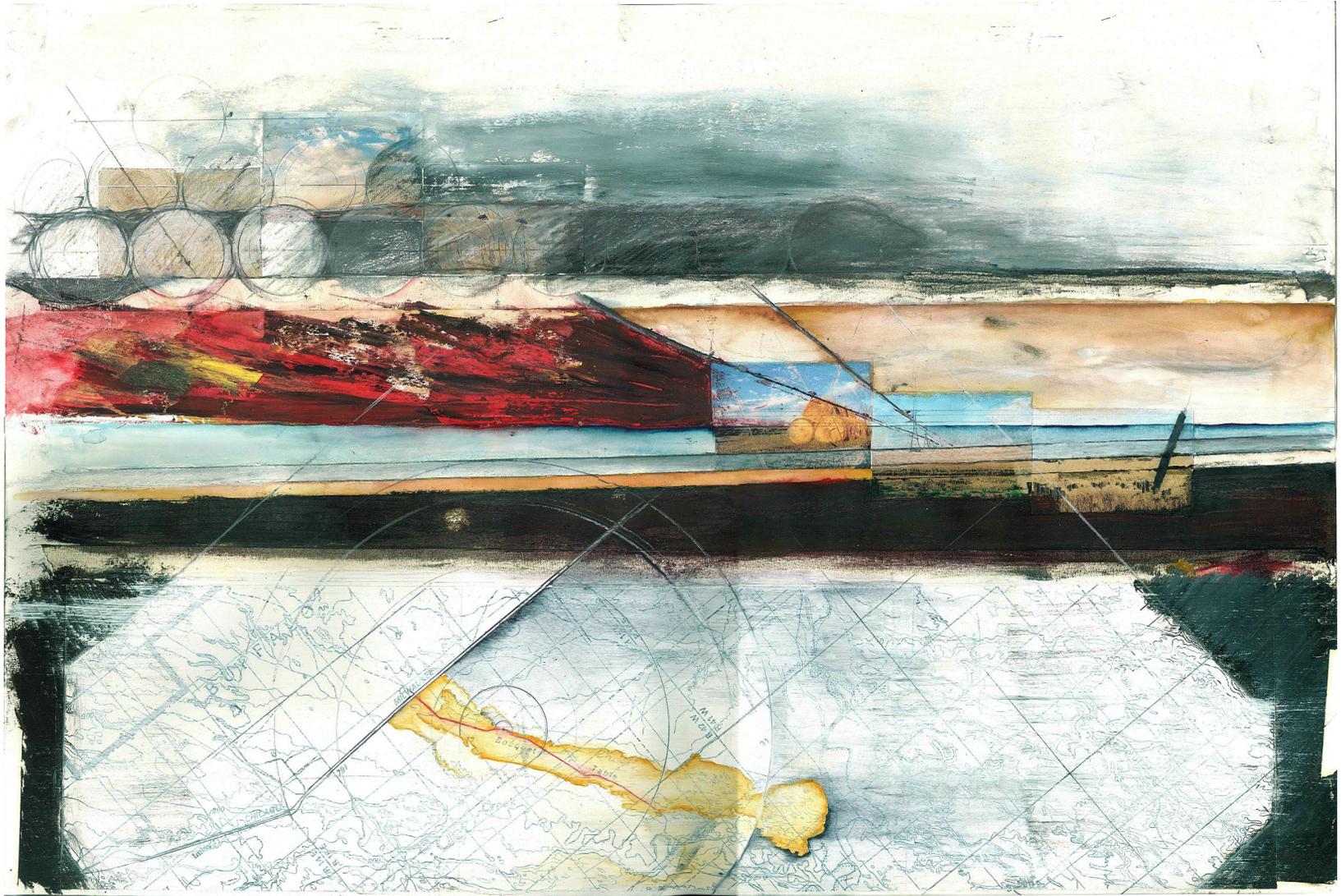
by narrow winding rivers and punctuated by small groupings of Cottonwood trees are all subjects of this drawing inquiry. Uninterrupted continuity is often times offset by episodic elements dotting the landscape [figs. 15 thru 19].

The intent of the drawing effort is more than documenting that which is present and discoverable [figs. 21 thru 25]. There is an ongoing internal subtext that is seeking to plumb the depth of the moment [fig. 20]. In a matter of speaking,



[fig. 18] *Grasslands Site Study*, pencil and cut paper strip collage, 22"x4"

*A unique feature of the Buffalo Gap Grasslands is the sudden and solitary bluffs that punctuate the landscape, rising suddenly up from thousands of acres of flat land.*



[fig. 19] *Grasslands Site Study*, mixed media collage on drawing paper, 22"x18"



[fig. 20] *Grasslands Site Study*, oil bar on construction paper, 18"x18"

there is a recorder running continuously as the eye works through the first layer of aesthetics down to the deeper levels of experience and impression. The trick in each drawing is to achieve a delicate balance between what is seen and felt, to not obfuscate the qualities of the physical environment with the impressions of the experience.

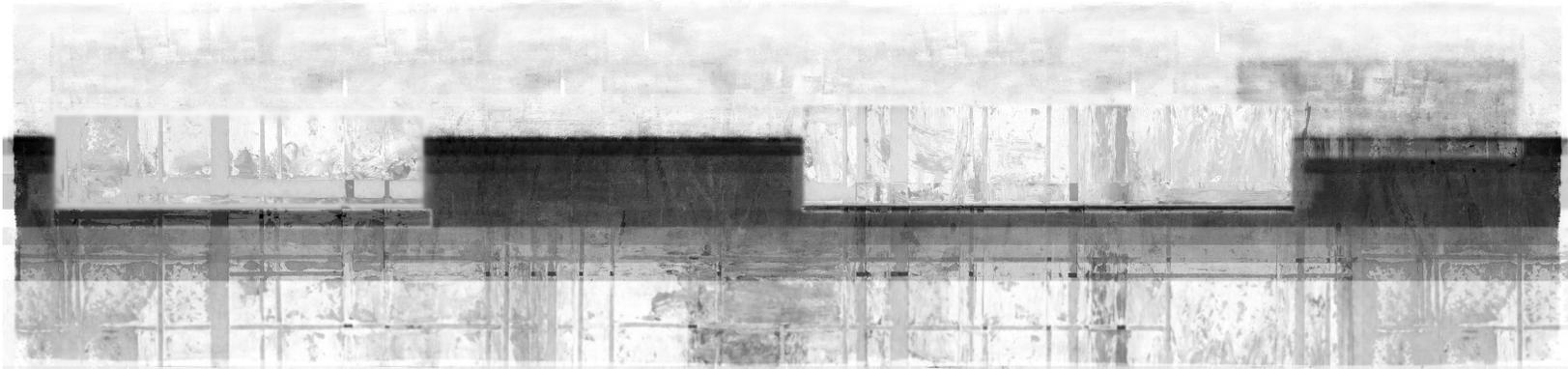
It is an attempt to draw ether with charcoal. It is an attempt to balance gold and feathers. Yet something concrete must be recorded or the

drawing is of no use; however, the drawing must remain “open” and loose so that various interpretations can be made. There is a seeming contradiction to this notion, but in actuality it is more of a struggle. To work or better yet execute in this manner is challenging. A drawing can be effective and then quickly dissolve into a dead end. Conversely, a stunted drawing effort may suddenly and unexpectedly turn into a work of great gravity. It is a very slippery and mercurial work process.

### Notes

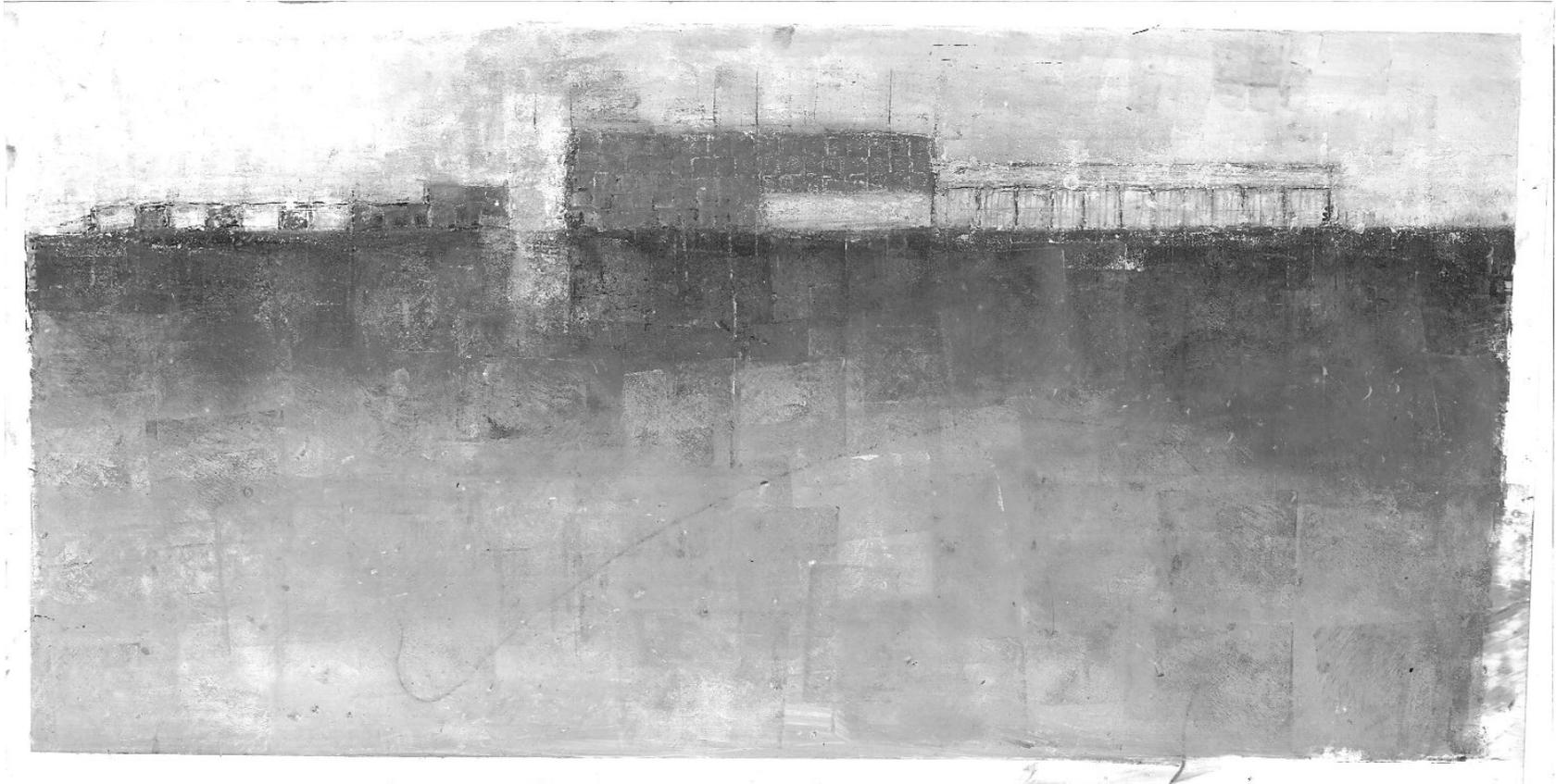
1. Walker Percy's novel, *The Moviegoer*, is not about architecture. It is about a young man, Binx Bolling, who lives for the brief and bright moments of fleeting fantasy he experiences at the movies. But reality keeps impinging on his fantasy world. Ultimately caught between the imaginary and the concrete, and with the “everydayness” of the real world continually creeping in, he's forced to reflect on the nature of the search and how it might elevate him from the trap and despair of common and ordinary life:

“What do you seek - God? you ask with a smile. I hesitate to answer, since all other Americans have settled the matter for themselves and to give such an answer would amount to setting myself a goal which everyone else has reached - and therefore raising a question in which no one has the slightest interest. For, as everyone knows, the polls report that 98% of Americans believe in God and the remaining 2% are atheists and agnostics - which



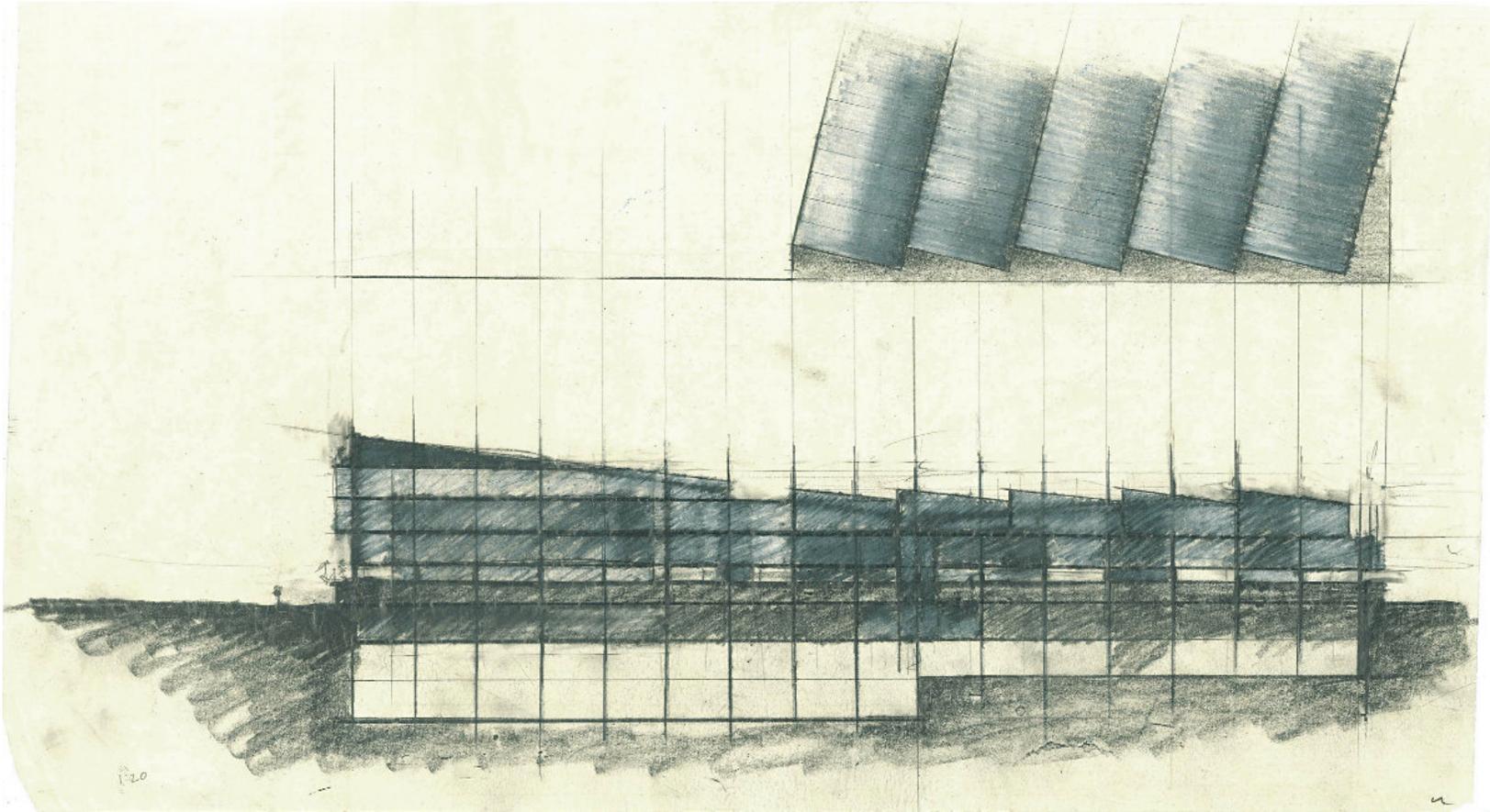
[fig. 21] *Exterior Elevation Study*, oil bar on vellum, 24"x6"

*The challenge to this method of drawing inquiry is making the leap from generative drawing to a more formal representation depicting what has been discovered without losing the original drawing's potential. This image is a direct offshoot of fig. 20. It remains loose, yet starts to suggest built form, mass and shape.*



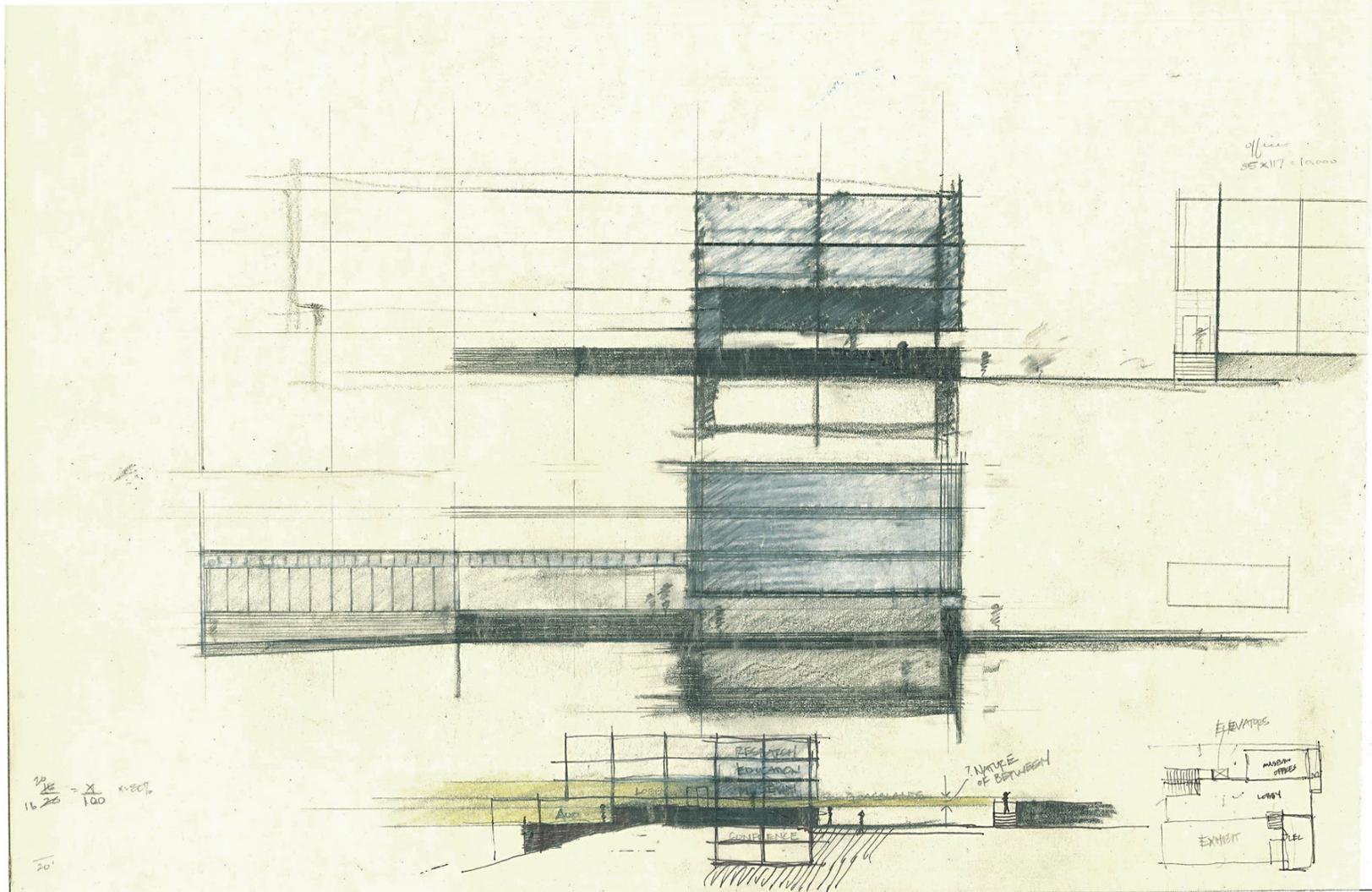
[fig 22] *Exterior Elevation Study*, oil bar on vellum, 18"x6"

*This image is also an offshoot of fig. 20. The focus is not so much on form and material, but on mass and adjacency.*



[fig. 23] *Exterior Elevation & Plan Study*, pencil, colored pencil on trace, 17"x11"

*Focusing on the role of light and building orientation in the project, this drawing introduces even more definition and clarity in an effort to test an idea. The introduction of hard line and scale provide some physical and structural framework. But as always, drawings in this method of graphic exploration are not final solutions but generative efforts that ideally lead to further idea development. Beyond the obvious structural grid, the section study examines experiential qualities - those of compression and light.*



[fig. 24] *Building Section Study*, pencil, colored pencil on trace, 17"x11"

*The ideas of passage, entry and progression are themes in this section study that attempts to explore the ideas found in figs. 12 & 13. The calm, anchored base sits below light filled sky levels.*

leaves not a single percentage point for a seeker.”

*This passage does a beautiful job of articulating the difficulty of making room for the search process, of letting things remain indeterminate and unresolved, for it's precisely this instability that's potentially so fruitful. (The Moviegoer, Percy, Walker. Alfred A. Knopf, Inc., New York, 1960).*

2. “I eat roast beef.” *This is, by far, my favorite line of any manifesto I have ever read. By their very nature, man-*

*ifestoes are prone to excited overstatement and hyperbole, but this phrase says so much more than it even intends. In an effort to articulate and justify his place in the modern world, Loos argues for the utilitarian, unadorned, simple lifestyle of the modern man. In so doing, he eschews the fancy trappings of the “stragglers”, those lagging behind, even slowing down, the cultural revolution of the early 20th century.*

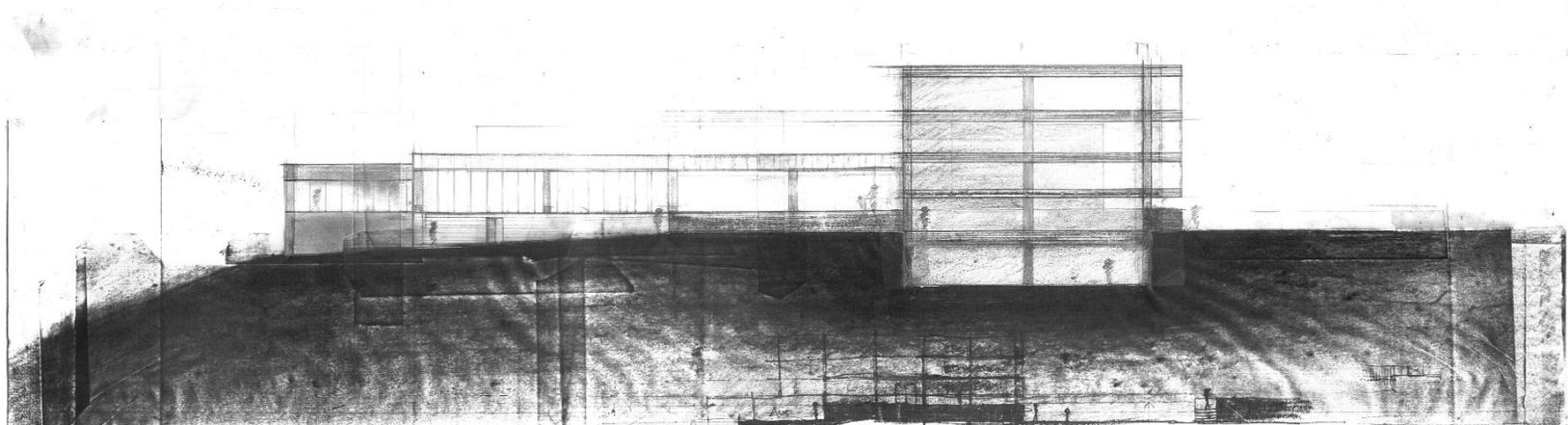
*The full quote from Ornament and Crime is as follows:*

“The show dishes of past centuries, which

display all kinds of ornaments to make the peacocks, pheasants and lobsters look more tasty, have exactly the opposite effect on me. I am horrified when I go through a cookery exhibition and think that I am meant to eat these stuffed carcasses. I eat roast beef.”

*Thank you, Adolf Loos.*

Programs and manifestoes on 20th-century architecture, *Conrads, Ulrich, p. 21.*



[fig. 25 ] *Building Section Study*, pencil and charcoal on photocopy, 24”x8”

*One of the tenets of this representational process is the constant presence of texture, layer and the use of previous images as a base upon which to start another drawing. The more information contained on the page, the greater the opportunity for unplanned discovery or compelling juxtaposition.*

# PART III: THE RESEARCH

*The power of objects and the gravity of beauty*

*“There is a demand while drawing one be present.”*

PART I: THE INQUIRY

“The Intangible Nature of Tangible Things”

To move the research along, a thetic structure has been established that focuses on the nature of the interaction between opposite, yet complimentary bodies of ideas. It is of one and the other; of primary and parallel; of mind and body; of generative and inert; of drawing and writing. And ironically, of beginnings and more beginnings.

DRAWING METHODOLOGY

The task is to see where these ideas link and how they merge with and influence each other. In a way, how one idea becomes context for another. This is

where understanding lies.

How is one "to be on to something"? For this thesis, the answer to that question is quite simple - through the act of drawing. But what types of drawings? How does one draw this way? And more difficult yet, how does one find meaning?

TYPES OF DRAWING

For purposes of this thesis, the drawing types are not traditional measured, sectional, or mechanical drawings, for they deal primarily with what is already understood. They possess the power to

expand understanding of building and architecture, but typically through refinement of a known condition. Conceptually, they are the above grade condition. What this thesis pursues is the below grade condition, both an artistic and theoretical foundation, of sorts.

As drawing types, measured drawings take too long to produce. Too much must be understood before a mark is laid on the page. As a result, they generally fall outside the scope of this thesis, which instead focuses on the immediate return on investment of generative and gestural drawing

types. This is not to say some images are not hard line drawings (several of the most compelling hinge drawings are quite precise), however, they make up a small fraction of the total body of work.

As mentioned, the primary drawing types used in this effort are expressive and gestural. They are done quickly and repeatedly. The intent is not a few sacred images; rather, multiple images built on the previous effort. The drawings are typically loose and open, with one effort informing and affecting the next. It is not about what is known, but about what might be found. It is a method more commonly seen in an Art Department drawing studio than in an Architecture Department design studio. And it is more typically the province of fine artists, painters, drawers and print makers - of Jim Dine - not of Mies Vander Rohe.

#### FOUND MEANING

What meaning is found and revealed comes precisely because of this method's immediate and reiterative nature. The value and payoff of the process is not typically found in the completed product, although that can happen. Such "end of process" discoveries are dramatic, but less fre-

quent. The goal is not to create a final resting place or a repository for ideas, rather to leverage ideas found in the making of the drawing into subsequent drawings that in their aggregate inform ideas on building and architecture. The drawing is a labor; the Drawing is a Laborer.

Fundamental to this premise is the belief the marks made on the page must be read and interpreted. Engaging in reading and interpreting marks will yield ideas that can influence and shape the design process. The focus of this drawing method is not on the thing drawn, but on the ideas gathered from the interpretation of the thing drawn. Serving as analogs and propellants, the drawings begin to suggest other ideas, ideas outside of the thing drawn. Theoretically, the drawings could be of anything or any artifact, for what is drawn is of less consequence that what ideas are pulled from the drawing.

This method places a high degree or responsibility on the designer. Making the drawings is neither a casual nor a passive effort. There must be a constant and vigilant attention given to the marks made on the page. The reading of the drawings is not something saved solely for the completed drawing. It occurs simultaneously with the act of drawing. Not only does it demand an

active engagement in the process and a willingness to find things, but it also requires an ability to divine and ultimately edit the ideas generated. There is a real possibility, if lazy or careless, that the ideas generated confuse and obfuscate rather than catalyze.

Or worse yet, no ideas may be found.

This is the trepidation briefly mentioned in the *Preface*. But there are ways to limit this caveat. Given that this way of working tends to broaden design possibilities not narrow them, how then is the process guided and managed? The over arching critical structure behind any interpretation of the drawings asks this question, "how do issues raised by the drawings inform ideas of Architecture and building?" There is the ever-present intent to migrate issues found in the drawings into refineable and testable ideas about buildings. Theoretically, the migration seeks to link Phenomenology to Tectonics and Heidegger to Frampton.

This goal - to transform drawings into architectural ideas of form and space - stops shy of committing to rooms and program. By drawing, in this case a door hinge, the intent is to reveal the nature of the hinge, or as odd as it might sound, Hingeness [fig. 26]. In the conditions of

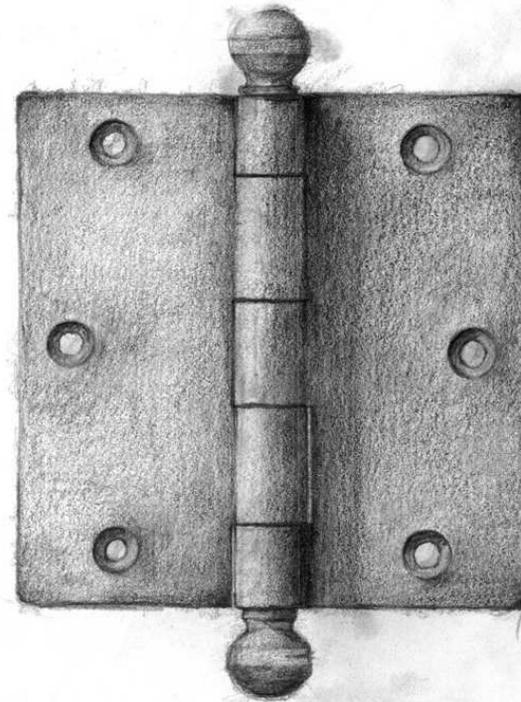
Hinge - notions of age, material, function, construction, utility, connection - are found its intangible elements. It is precisely from these conditions that ideas about building and architecture can be informed.

So, how to draw this way? Interpretation moves the artifact drawn from an objective state to a subjective state; interpretation moves the drawing from a noun to a verb.

#### DRAWING SUITES

This drawing methodology is an attempt to provide a framework for a guided and measured design pursuit. The drawing study is divided into three related categories or *drawing suites*. Outlined below, they move from the general role of ideas generated to the specific notion of ideas tested.

The first study or drawing suite is *The Hinge Study: A Leveraged Artifact*. Over the entire length of the semester, a single object was repeatedly drawn. The artifact is a brass door hinge taken from a Minneapolis house built in 1916 [fig. 26]. This first series of images is the least building focused of the three suites. Instead, it's purpose was to generate ideas about the nature of the project. Images were scanned for possible ideas about design direction and read with an eye



[fig. 26] *Hinge Study No. 1*, pencil on paper, 12"x17"

*No better place to start than with the thing itself. This first effort is guided by a simple parameter - draw only what is seen. Do not interpret. Do not embellish. Do not abstract. In essence, it is an attempt to transcribe. But even this first, singular effort reveals the difficulty and seemingly impossible task of non-modification.*

toward discovering broad topics of architectural pursuit. They were about possibility.

The second more targeted drawing suite is *Rowers and Levers: Fulcrum and Compression*. Within this suite of images a more focused design direction is pursued. Fundamental elements shaping the activity, use, and design of the building - of rowing, water, connection, leverage, motion and speed - ideas both obvious and latent in the program are examined [figs. 1 & 27].

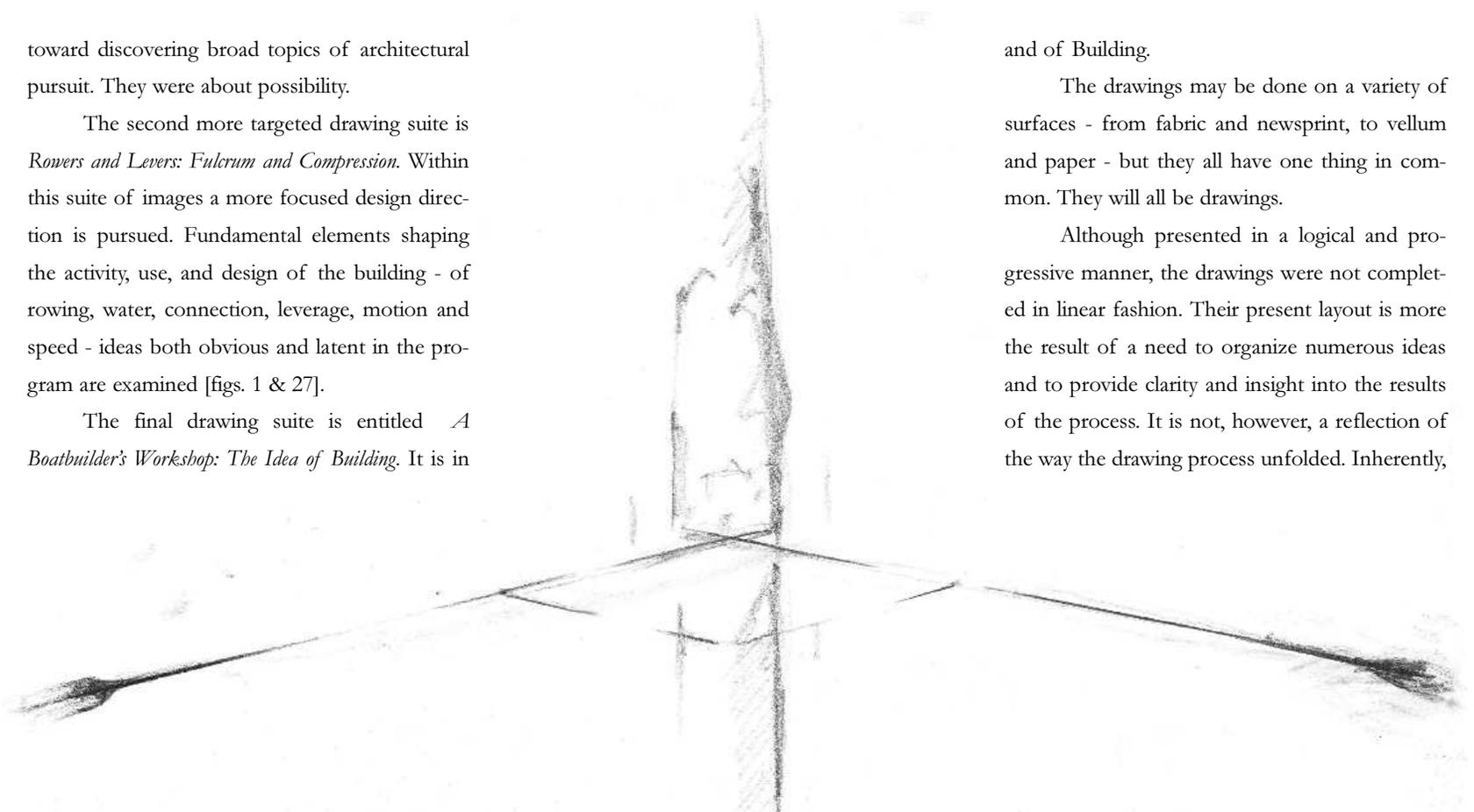
The final drawing suite is entitled *A Boatbuilder's Workshop: The Idea of Building*. It is in

this section that earlier ideas found through the drawings are clarified [fig.28]. This is the most obviously building focused of the three suites. Nonetheless, it is open and flexible in its scope of exploration, still infused with the desire to discover and leverage the intangible nature of Things

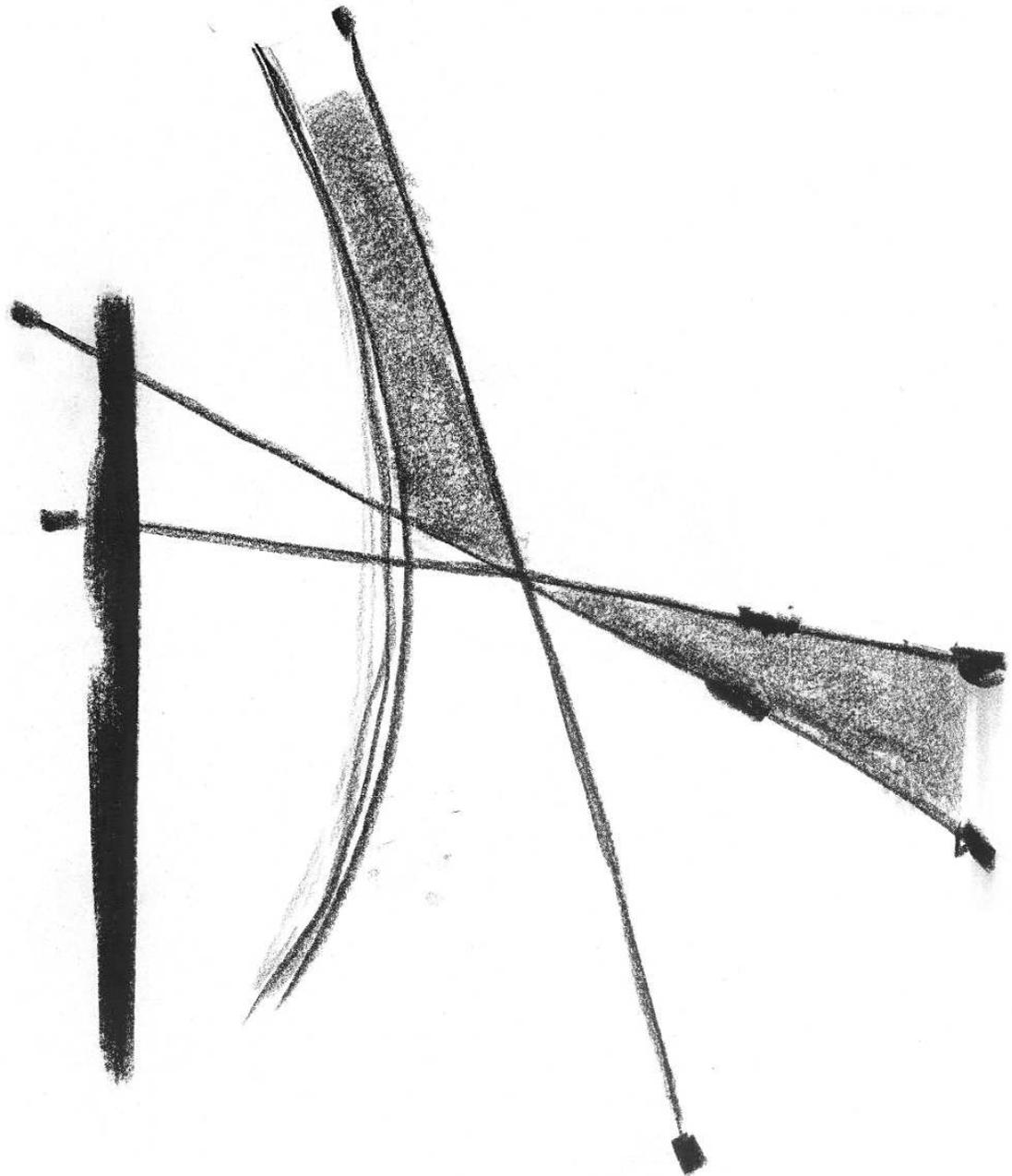
and of Building.

The drawings may be done on a variety of surfaces - from fabric and newsprint, to vellum and paper - but they all have one thing in common. They will all be drawings.

Although presented in a logical and progressive manner, the drawings were not completed in linear fashion. Their present layout is more the result of a need to organize numerous ideas and to provide clarity and insight into the results of the process. It is not, however, a reflection of the way the drawing process unfolded. Inherently,



[fig. 27] *Rowing Study No. 8*, pencil on paper, 12"x17"  
With the subject of the thesis design effort being a boat builder's workshop, the elements of rowing, skulls, water, leverage and movement were natural and obvious topics for a drawing inquiry. Figure 27 is a simple sketch exploring balance, delicacy, angles and connections found in a skull.



each suite has its own distinct scope and boundaries, however, they were developed simultaneously to allow for each to inform the others.

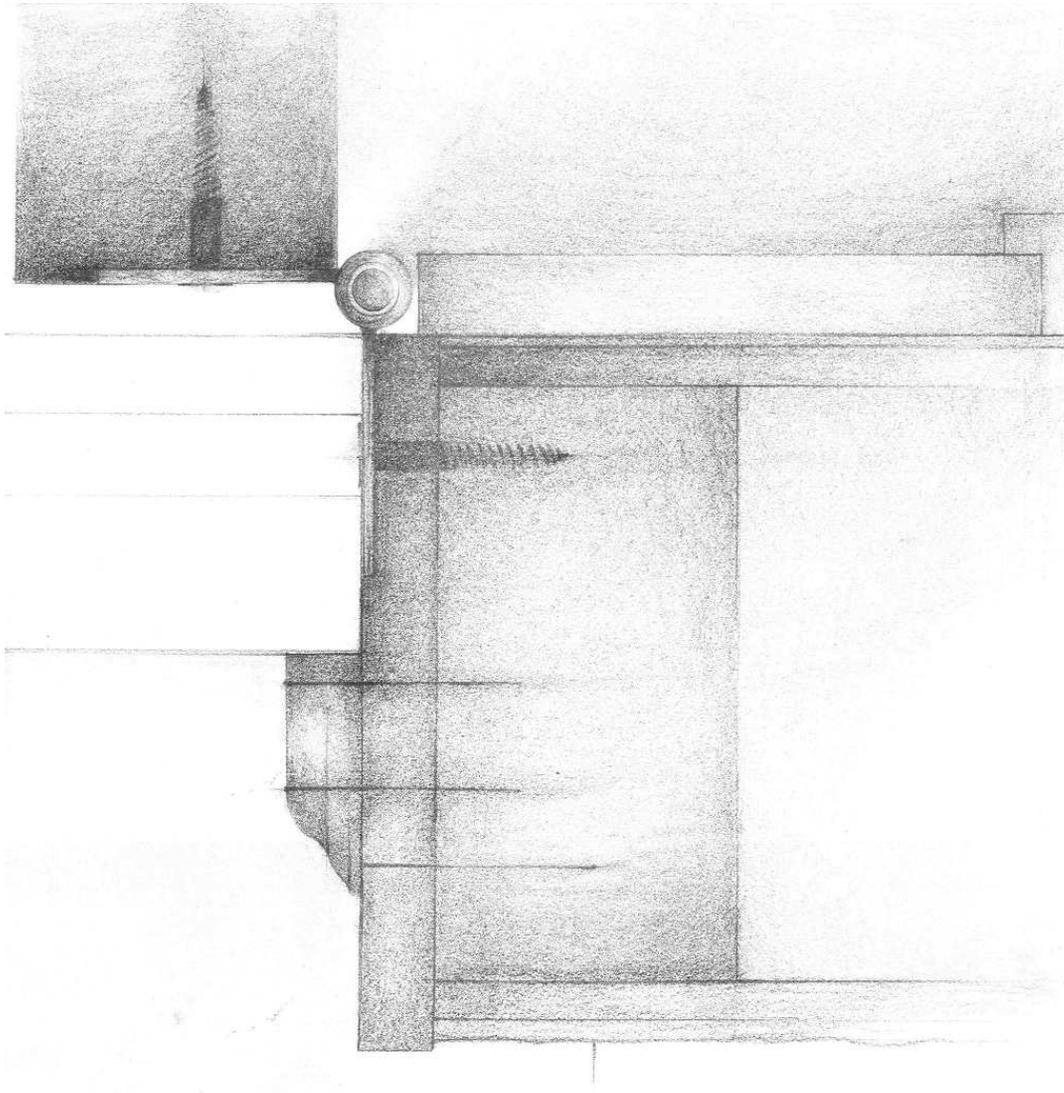
The following three sections present an edited view into the range of drawings generated. An effort was made to represent best the various drawing inquiries. These suites are not comprehensive catalogs of every drawing made. They are highlights. Drawings not shown in this section appear in PART IV as support material for one of the developed design efforts.

[fig. 28] *Workshop Study*, charcoal on paper, 12"x17"  
*Multiple design threads were revealed and pursued. The goal of this third drawing suite is not to present a completed project, but instead to demonstrate the variety of design options generated by the earlier drawings suites.*

*drawing suite 1*

---

THE HINGE STUDY  
*A Leveraged Artifact*

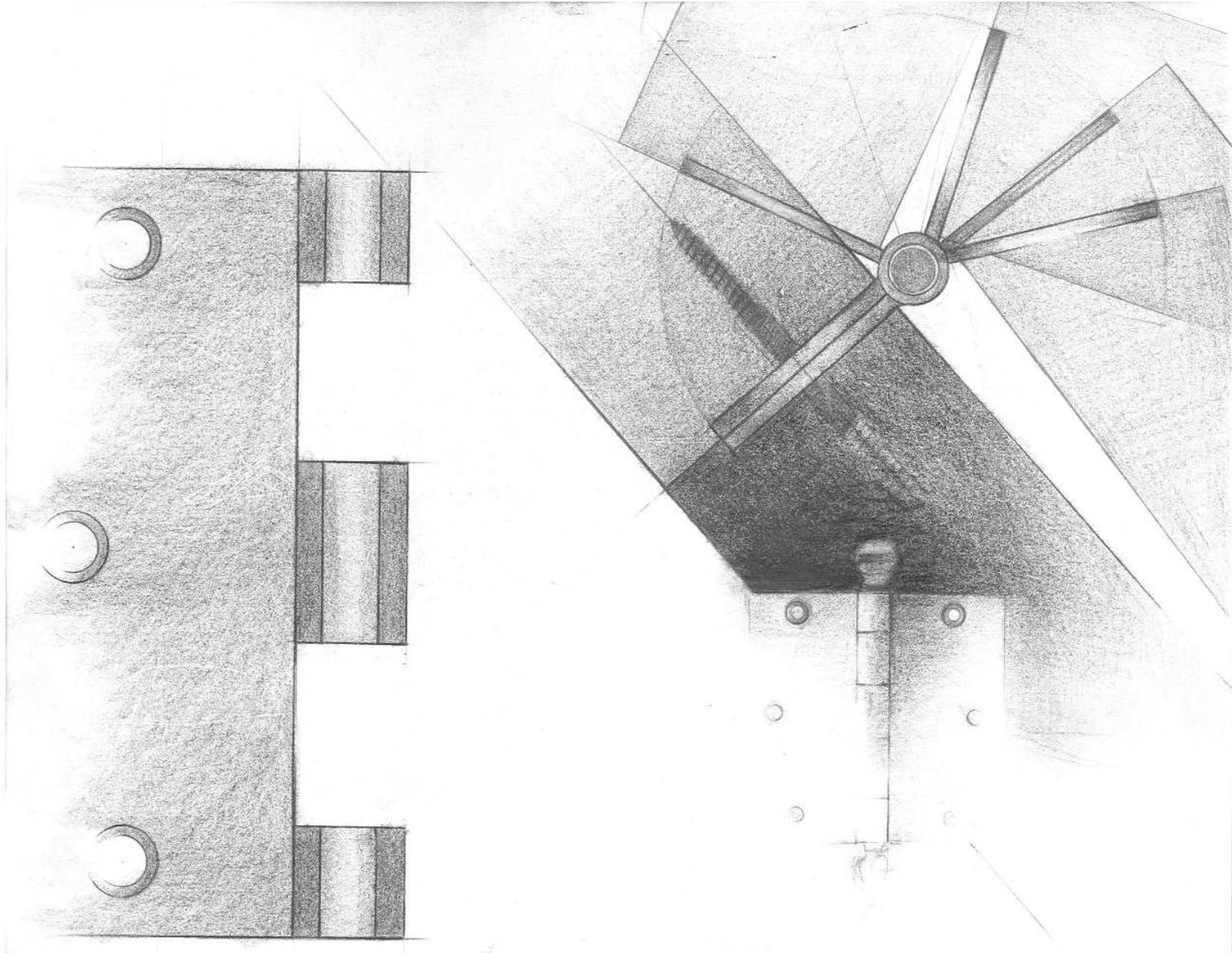


[fig. 29]

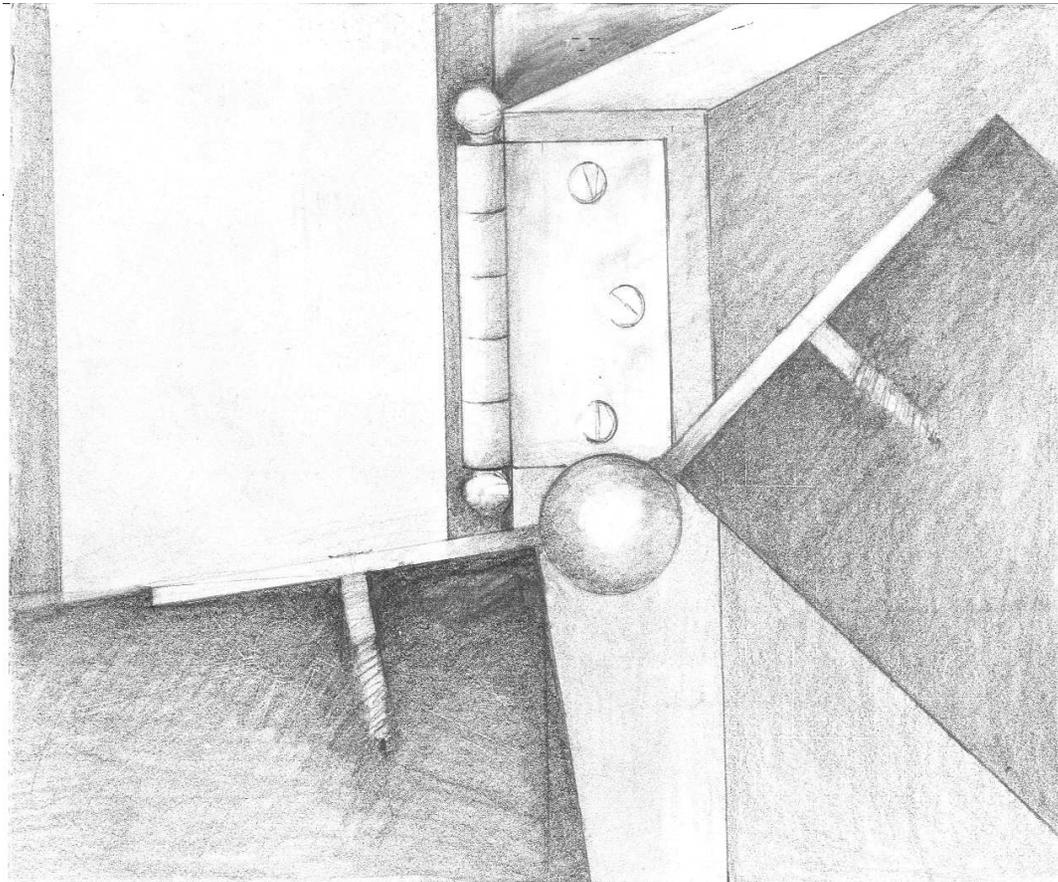
THIS FIRST DRAWING EFFORT [fig. 26] is guided by a simple parameter - draw only what is seen. Do not interpret. Do not embellish. Do not abstract. In essence, it is an attempt to transcribe. But even this first, singular effort reveals the difficulty and seemingly impossible task of non-modification. Every drawing is an invention. And as such, is exposed to interpretation.

Earlier, in PART I the critical ability of drawings to “make room” for ideas was discussed. It is this making of room that is the progeny of interpretation. To better understand this phenomena, a simple thetic structure has been established. As mentioned earlier, over the entire length of the semester, a single object is repeatedly drawn. The artifact is a brass door hinge taken from a Minneapolis house built in 1916.

In theory, the artifact could be anything. In reality, it is an artifact that is laden with architectural history and architectonic possibility. But the notion of hinge is not a stand-in for building. The act of drawing the hinge is actually an attempt to transcend the object, to forget the name of that which is being drawn. Ideally, the drawing becomes an analog. It’s a correspondent between the thing itself and the world of ideas the thing generates. The idea, now, becomes the thing.



[fig. 30]



[fig. 31]

[figs. 29 thru 31] *Hinge Study*, pencil on paper, 18"x12"

*With the exception of fig. 26, drawing suite 1 is not about a straight recording of the object. Although realistic in appearance, renderings have been layered and connected in unusual ways in a distinct effort to challenge the eye and the mind and to force a unique reading of the drawing. This method of drawing is similar the method shown earlier in the Buffalo Gap floor plan/elevation/section drawings (Part II - The Search).*

This simple framework serves as the foundation for a potentially rich and profound exploration into the power of drawing to generate ideas. Two points bear repeating, however. The hinge drawings are not metaphors for building or diagrams for design. The intent is not to design a “hinge” building, one that demonstrates the unique properties embodied by the hinge [figs. 29 thru 31]. However rich, the notion of hinge it is not the concept for this project. Instead, the desire is to capture the ideas suggested in the *interpretation* of the hinge drawings, ideas culled not only following the completion of the drawings, but as they are being done as well. It is about engaging with the work. Ideas may be found just as easily in the unique quality or nature of the marks made on the page. The visual and physical qualities of the marks of ink, pen and pencil made on paper are as potent as any qualities of the finished drawing. In essence, a soup can could stand in for the hinge.

In addition, this exercise is not about the documentation of the object; rather, drawing the hinge is an intermediate step, a way to access and probe larger architectural issues, conditions, and possibilities. Ideally, the making of the hinge  
CONTINUED ON PAGE 38



[fig. 32]



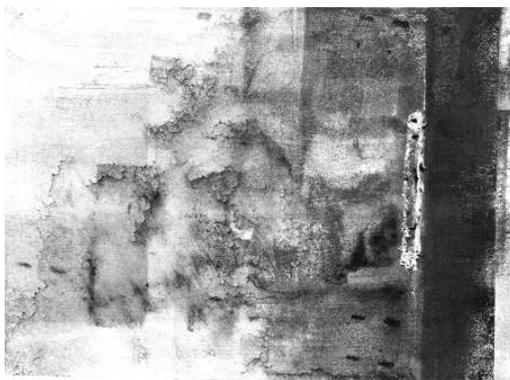
[fig. 33]



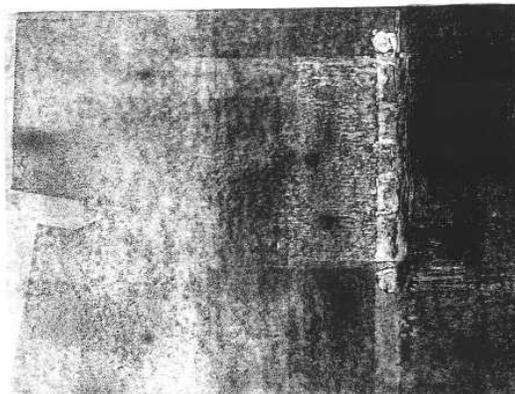
[fig. 34]

[figs. 32 thru 34] *Hinge Studies*, monoprints with printmaking ink on printmaking paper, 12"x18"

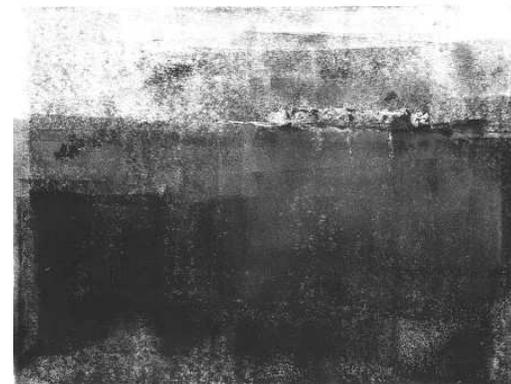
*This series of prints (the prints shown here are three out of a 10 print suite) examines the potential as well as kinetic energy inherent in a hinge. The challenge is how to draw or represent motion and effort. Again the drawing is not always about the Thing or the Object but about qualities of the object and what they may suggest about Architecture. These prints began to overlap nicely with the rowing study drawings in suite two. Connection, leverage, orbiting begin to surface as interesting and fruitful design elements for possible inclusion in the project.*



[fig. 35]



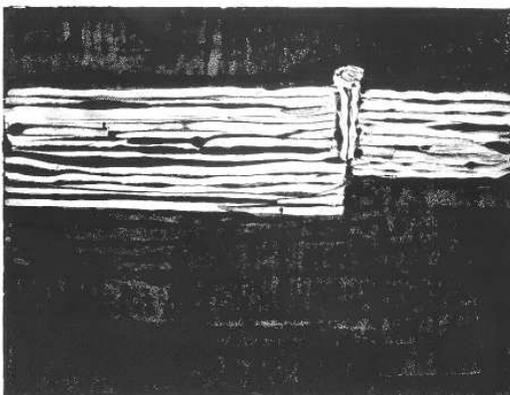
[fig. 36]



[fig. 37]

[figs. 35 thru 37] *Hinge Studies*, monoprints, printmaking ink on printmaking paper, 18"x12"

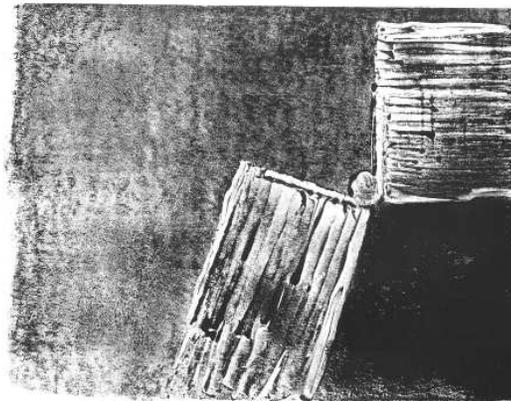
*This series of prints are arguably the most pivotal in the Hinge Series for it was from this set of images that the idea of a boathouse along the water was drawn. These images are so suggestive of boundary (land/water) and how one might inhabit or mediate that threshold.*



[fig. 38]



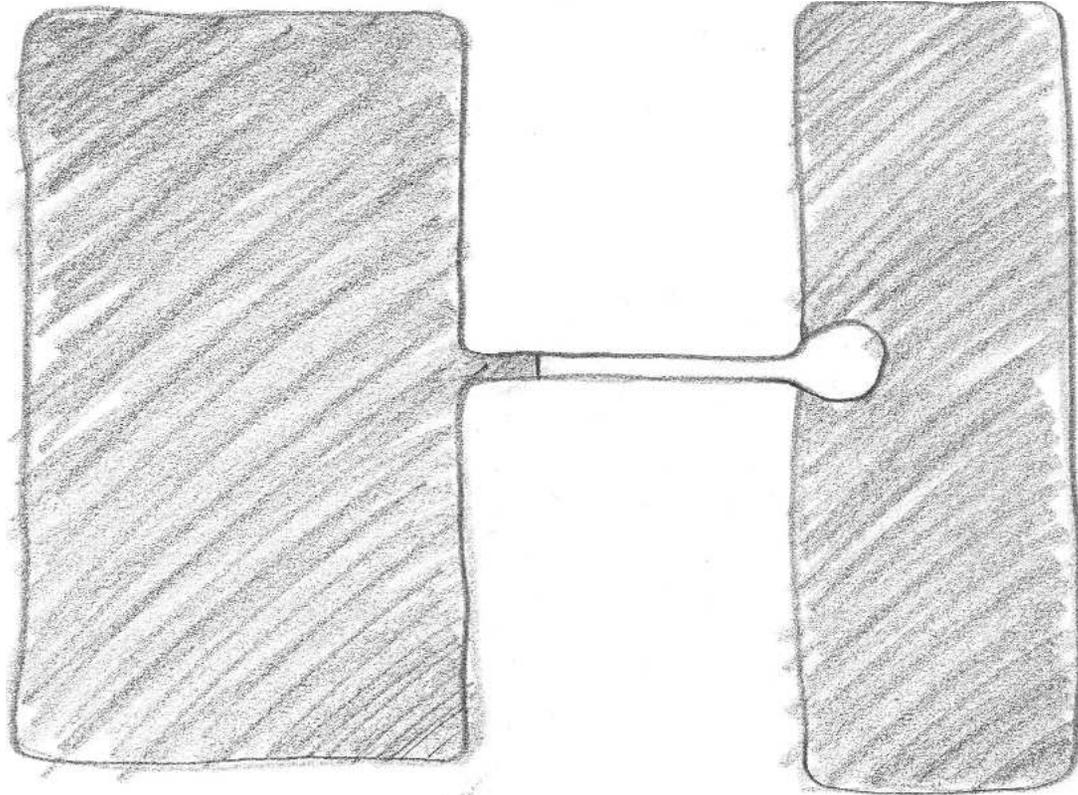
[fig. 39]



[fig. 40]

[figs. 38 thru 40] *Hinge Studies*, monoprints, printmaking ink on printmaking paper, 18"x12"

*The episodic nature of this mini-series dovetails nicely (much like figs. 32 thru 34) with the rowing studies. These ideas of rotation and mechanism in these images migrate into the project in various ways, most prominently in the floor plan. Fig. 28 is one of the best examples of the next generation or subsequent iteration of what was found in these images.*



[fig. 41]

[figs. 41 & 42] *Hinge Studies*, pencil on drawing paper, 18"x12"

*Most of the images shown so far are longer drawing efforts. Although the monoprints offer the possibility of repeated prints pulled from the original marks, this series is a quick pencil study made by never lifting the pencil from the page and looking almost exclusively at the object. The goal is to look intently at the object as the hand moves as an uninterrupted recording of what is seen. Though not precise, their light-hearted, even child-like appearance are very open and elemental. They are more like casual cartography than rigorous drawing.*

drawings takes the exploration beyond the object. Conceptually, a world is created around the artifact. The hinge becomes a lever [figs. 43 & 44].

The exploration of this generative method in Drawing Suite One, however, is only a part of a larger, parallel track of inquiry - it's *pre text* to a *next text*. Or, perhaps, more accurately, it's *co text*.

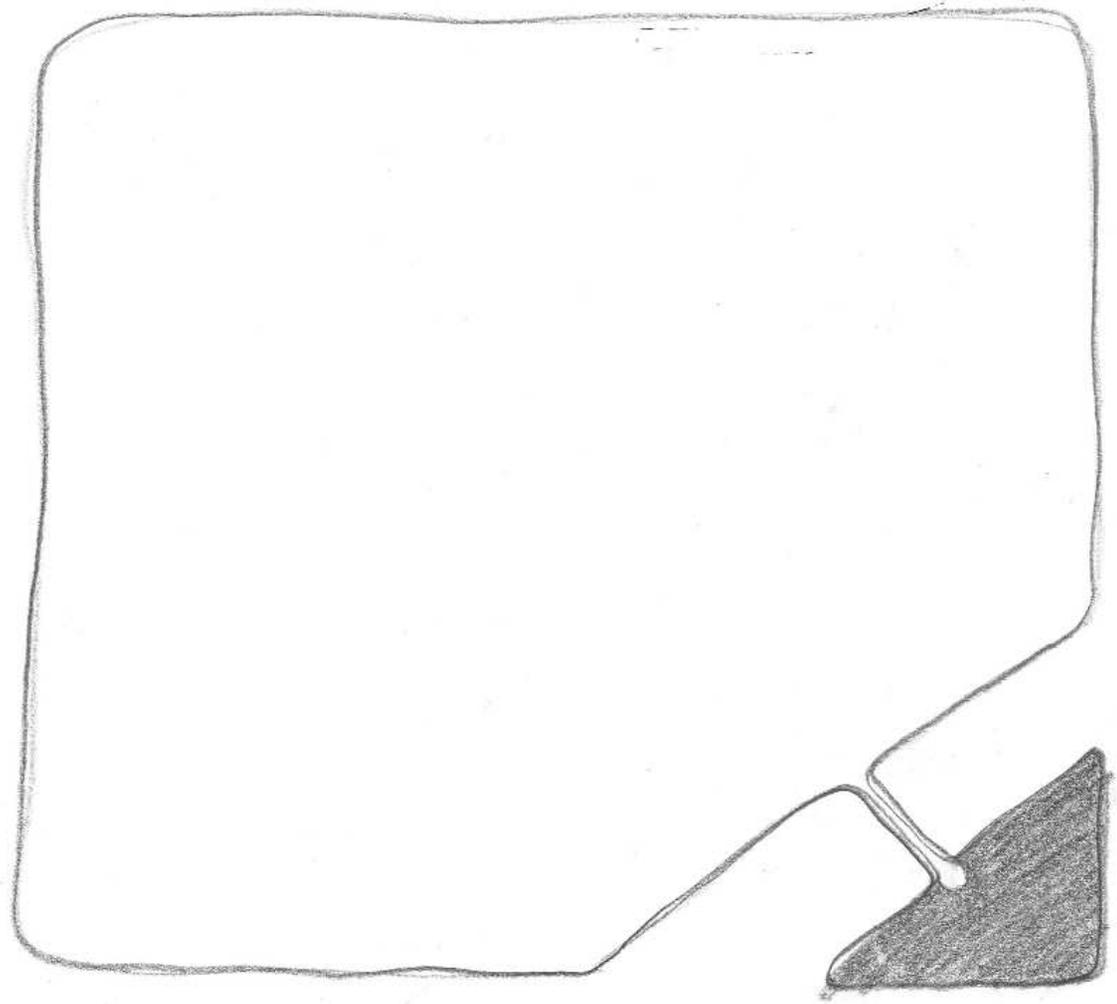
In a way, these drawings can be considered servants to another master, being inextricably bound to the fate of the design process. The hinge drawing exercise is not an independent or isolated effort; rather, it's elementally linked to the larger design project. As generative fields, the drawings create room - creative space - within which the design project may evolve and deepen. The drawings allow for ideas on architecture to enter in. The challenge to extract meaning, direction and inspiration from the hinge drawings will be the most difficult and rewarding aspect of this effort. How might the making of images expose and propel architectural understanding? The belief is that within this effort reside the possibilities of architecture. In fact, it is because of this effort that architecture may exist.

The Drawing Suite One inquiry focuses on intensity of observation and the power of representation - the result of seeing one Thing drawn

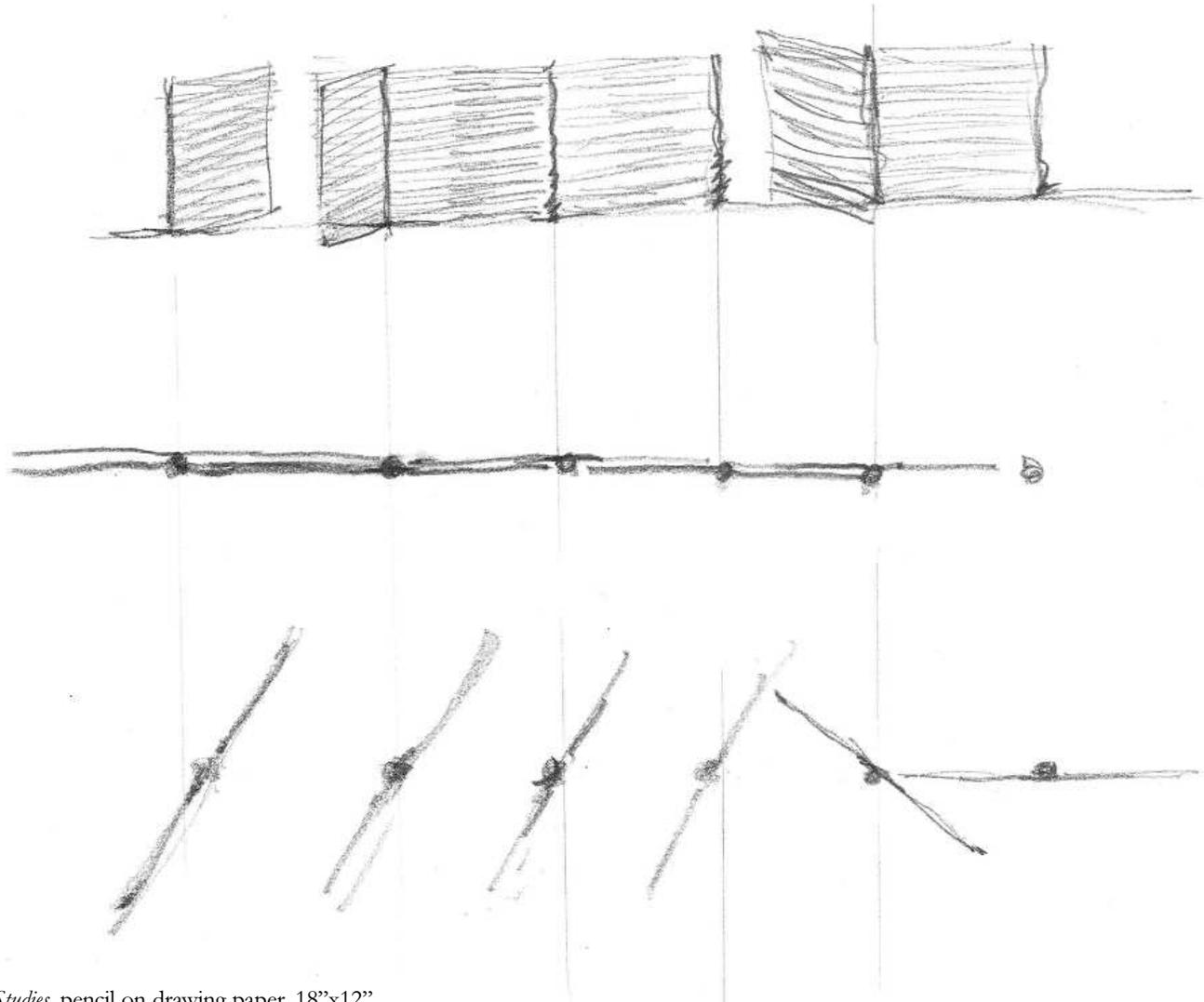
many times, in many ways [figs. 35 thru 40]. This will be a drawing exercise that finds, loses, and finds again. Jim Dine, an artist who has spent much of his adult life drawing and re-drawing a particular few artifacts has a quote that articulates the process of drawing a single object. “It’s just a way to begin,” he says, “a way of making a specific mark rather than an unspecific mark, but I literally don’t know what will happen each time.”

Cues will be taken from this American artist, as well as Austrian painter Lionel Feninger, and French theorist Jacques Derrida. These artists have one thing in common. They have chosen a variety of simple objects - a wooden box, a hammer, a bathrobe, a pastoral scene - with the express intent of studying them over an extended period of time. They are powerful examples of the ability of drawing to unlock, to find, or even to generate meaning and beauty [figs. 41 & 42].

Bill Blanski, an architect and thesis advisor, put it best when helping structure this process: *“At some point lines become form. At some point tones on paper become space. What tasks transform drawings into forms or spaces but do not commit to “rooms” or “buildings”? Consider the specific conditions of the hinge - how things meet, how things connect, how things age. And remember, always through drawing.”*



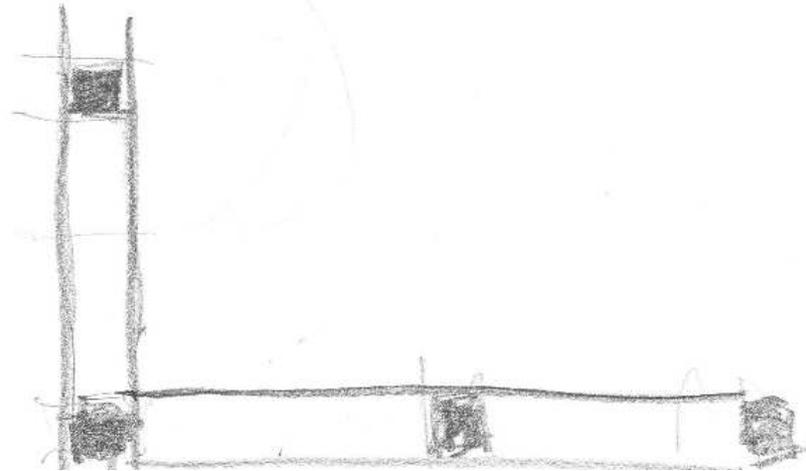
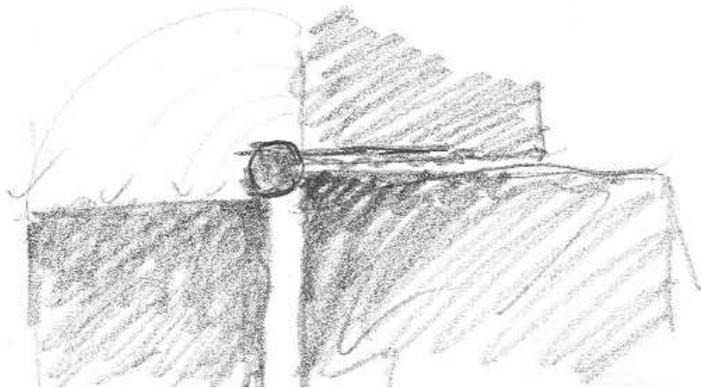
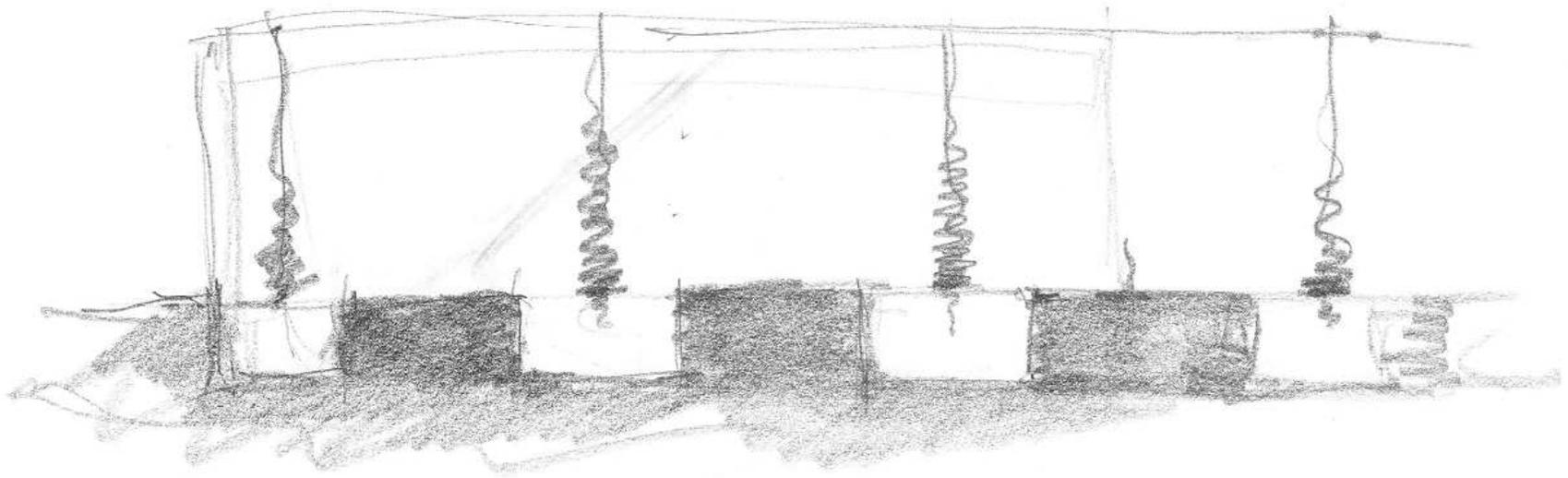
[fig. 42]



[fig. 43]

[figs. 43 & 44] *Hinge Studies*, pencil on drawing paper, 18"x12"

*The following two images are from a transitional set of drawings. Both hinge study and rowing study, they have a foot in both camps. It is not always possible or desirable to keep the different drawing suites separate. By design, the topics are interconnected and this thesis posits that ideas from one suite can and indeed must influence drawings in another suite. So as marks are made while looking at a hinge, ideas of architecture are evident on the page, as well. These drawings serve as a convenient link to Drawing Suite 2 - Rowers & Levers.*



[fig. 44]

*drawing suite* 2

---

ROWERS & LEVERS  
*Fulcrum and Compression*

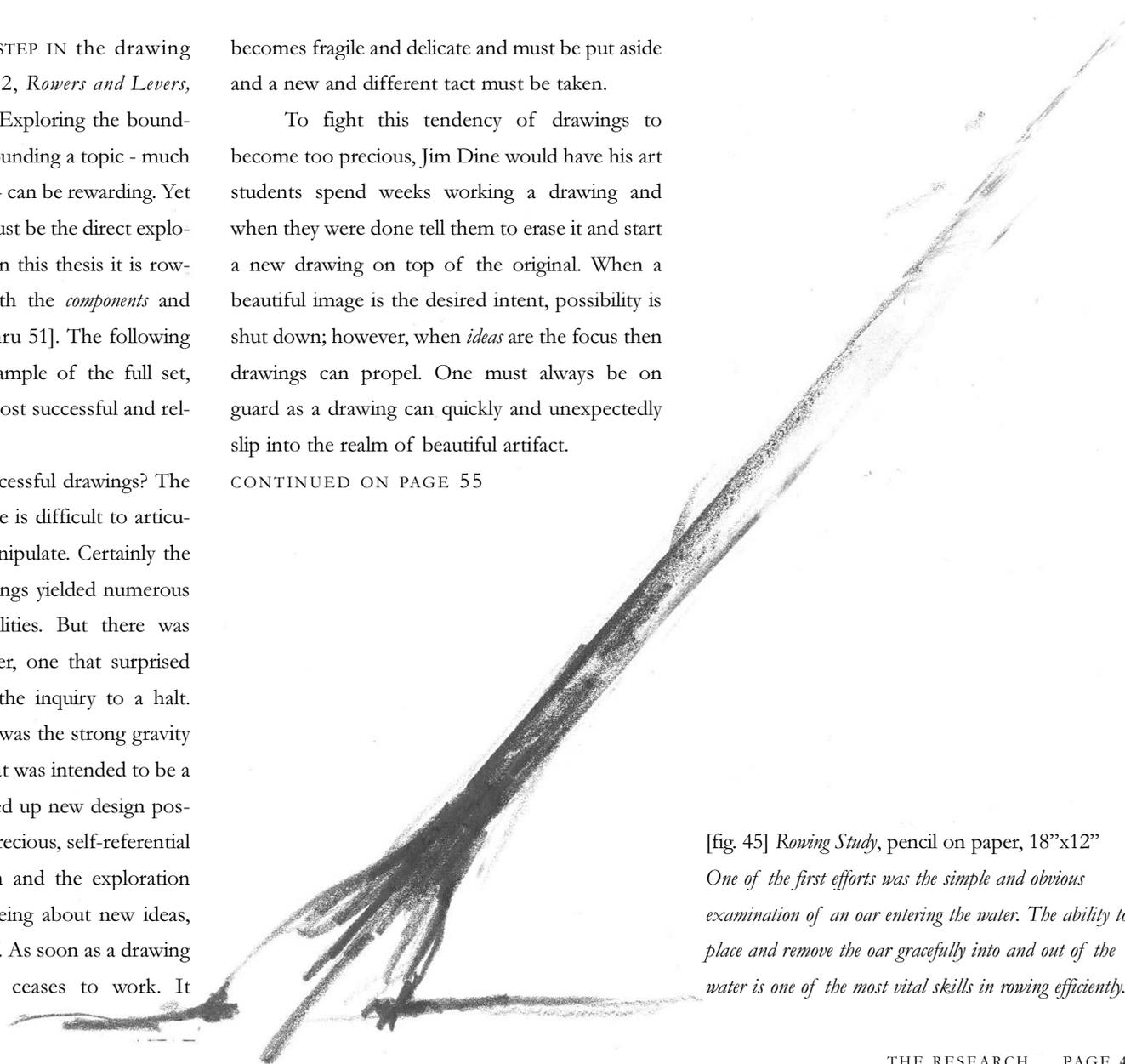
AN OBVIOUS NEXT STEP IN the drawing inquiry is Drawing Suite 2, *Rowers and Levers, Fulcrum and Compression*. Exploring the boundaries and tertiary ideas surrounding a topic - much as Drawing Suite One does - can be rewarding. Yet at some point the inquiry must be the direct exploration of the Thing itself. In this thesis it is rowing, or more correctly, both the *components* and *nature* of rowing [figs. 45 thru 51]. The following drawings, only an edited sample of the full set, serve as highlights of the most successful and relevant images.

And what of the successful drawings? The power of a successful image is difficult to articulate and even harder to manipulate. Certainly the majority of the good drawings yielded numerous ideas and exciting possibilities. But there was another element to consider, one that surprised me and at times brought the inquiry to a halt. What caught me off guard was the strong gravity of a compelling image. What was intended to be a generative effort that opened up new design possibilities instead became a precious, self-referential artifact. Inquiry shut down and the exploration dead ended. Rather than being about new ideas, the drawing was about itself. As soon as a drawing becomes too precious, it ceases to work. It

becomes fragile and delicate and must be put aside and a new and different tact must be taken.

To fight this tendency of drawings to become too precious, Jim Dine would have his art students spend weeks working a drawing and when they were done tell them to erase it and start a new drawing on top of the original. When a beautiful image is the desired intent, possibility is shut down; however, when *ideas* are the focus then drawings can propel. One must always be on guard as a drawing can quickly and unexpectedly slip into the realm of beautiful artifact.

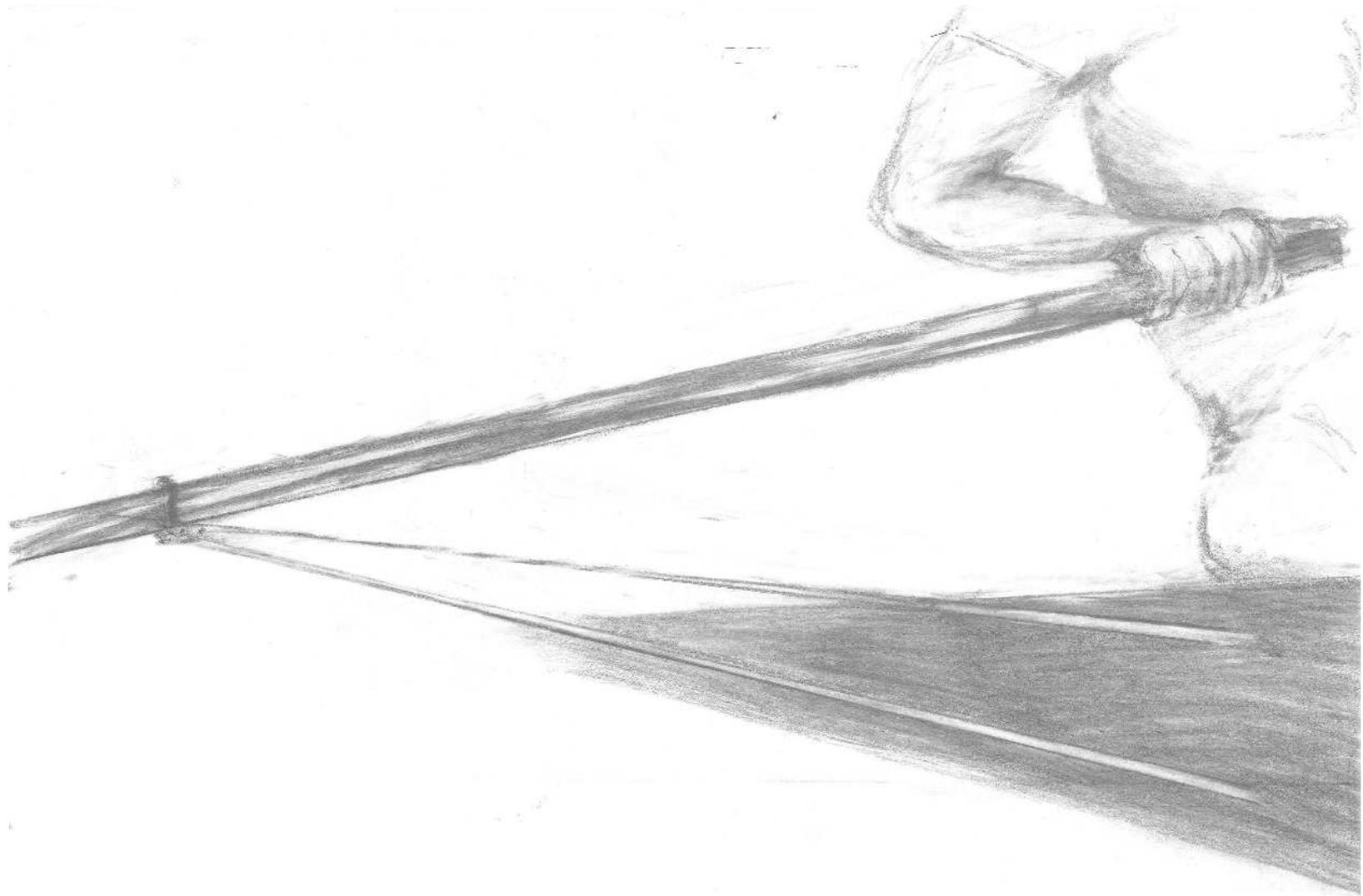
CONTINUED ON PAGE 55



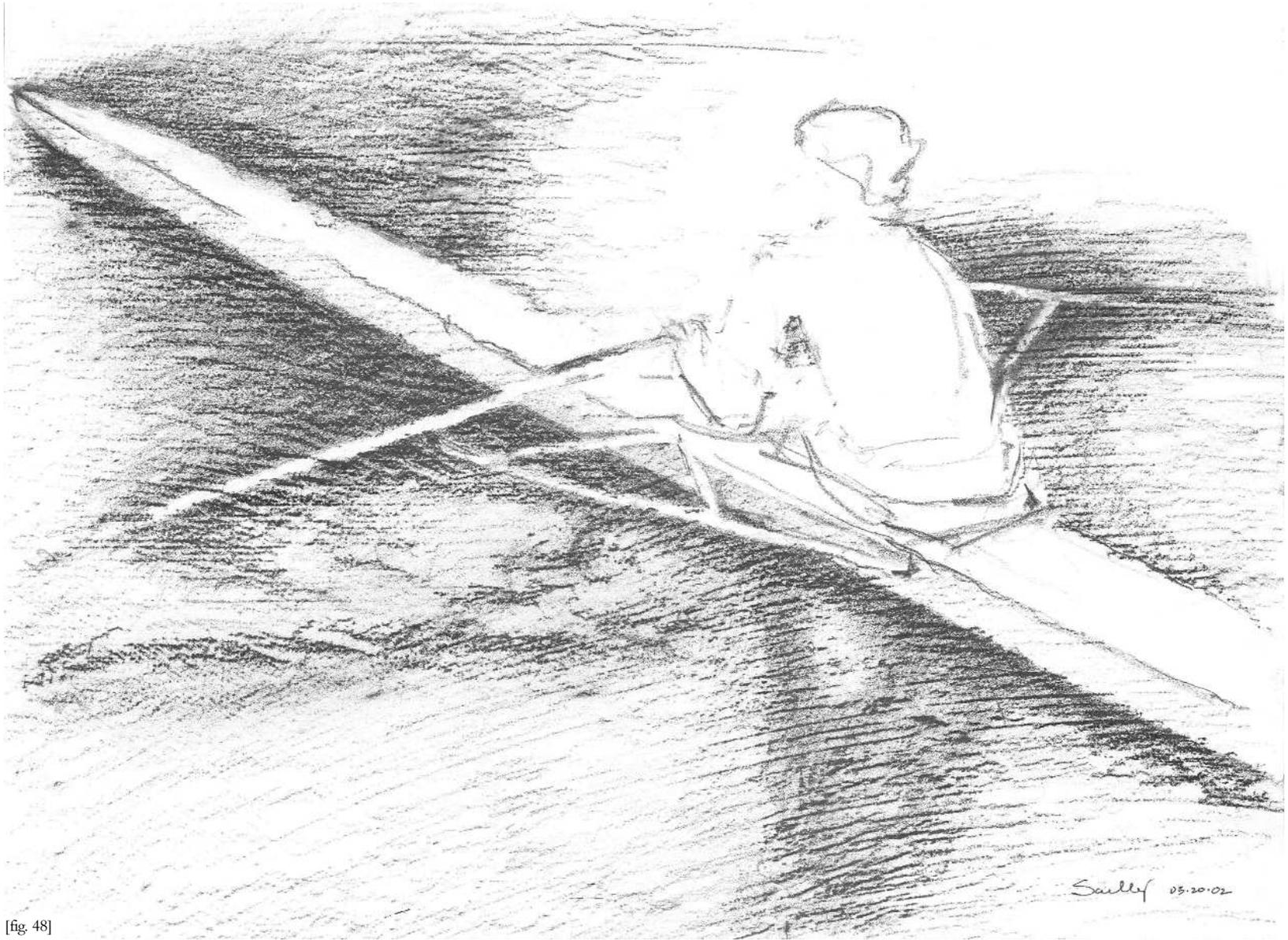
[fig. 45] *Rowing Study*, pencil on paper, 18"x12"  
*One of the first efforts was the simple and obvious examination of an oar entering the water. The ability to place and remove the oar gracefully into and out of the water is one of the most vital skills in rowing efficiently.*



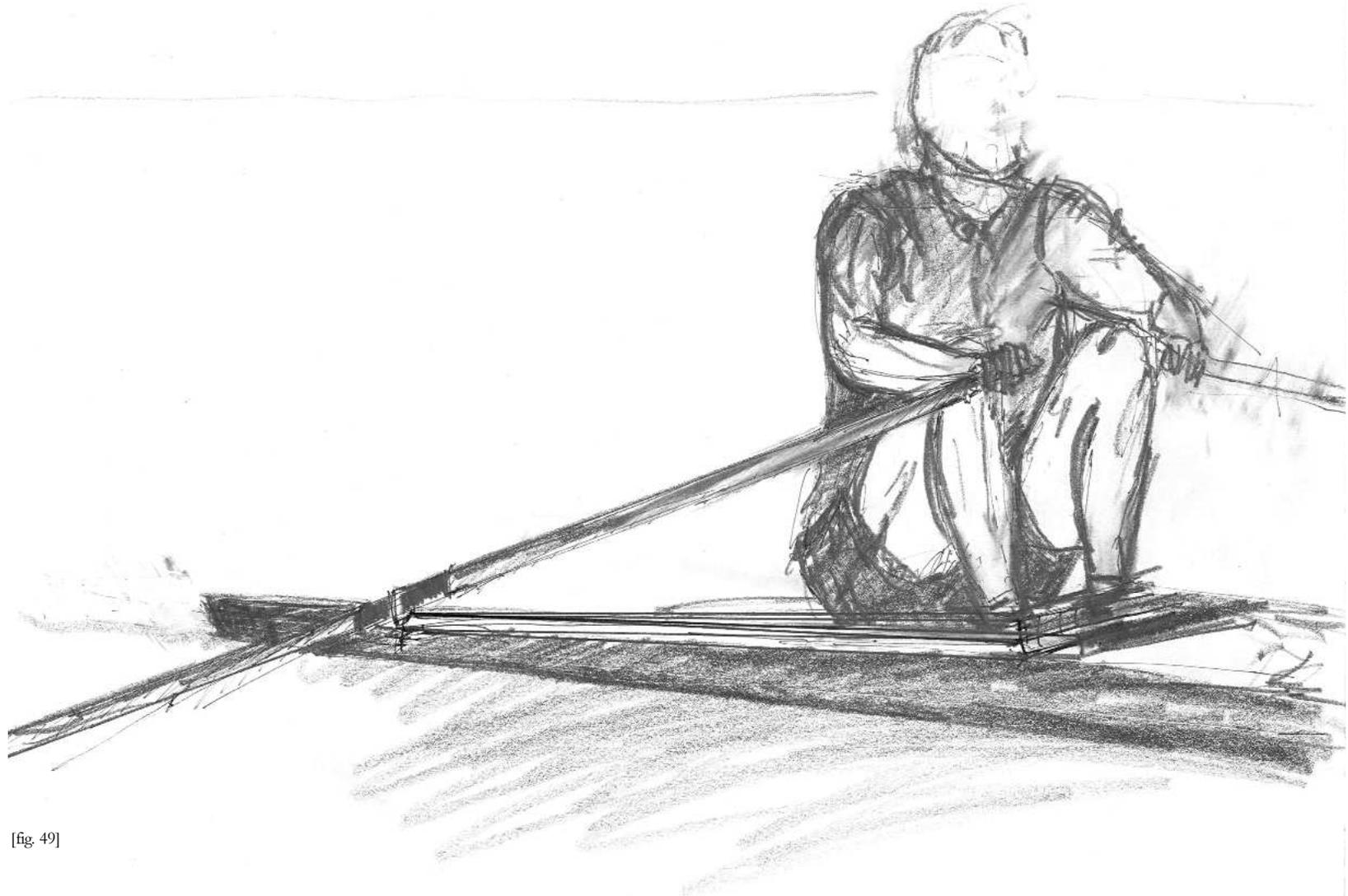
[fig. 46]



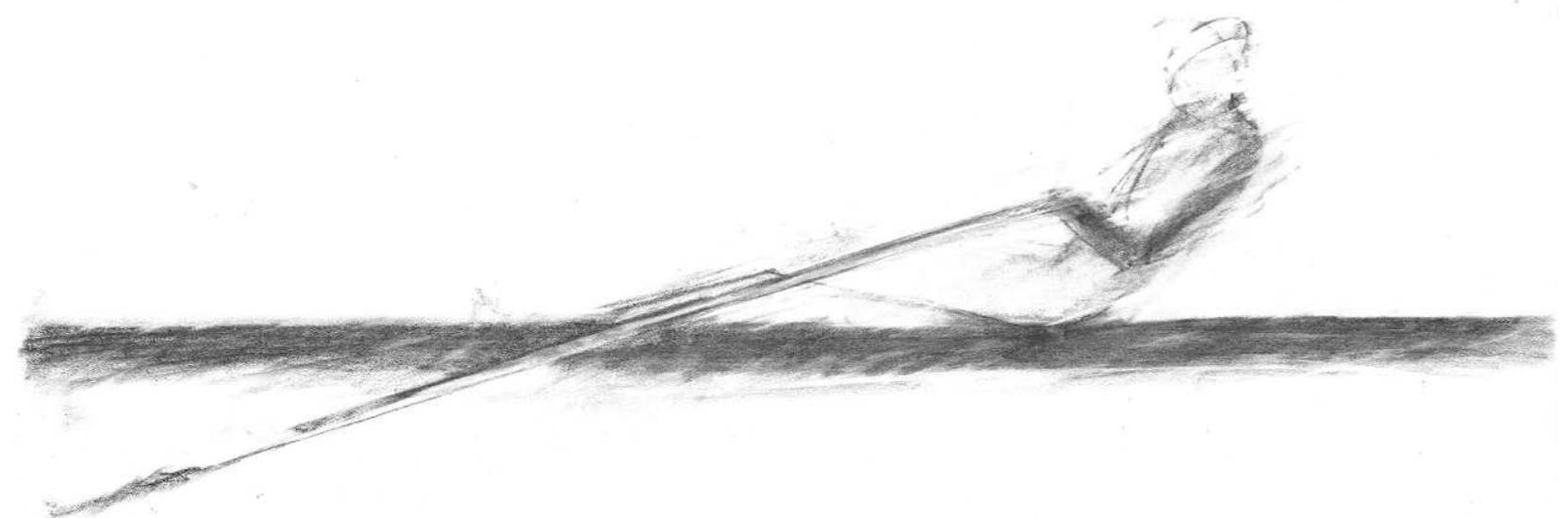
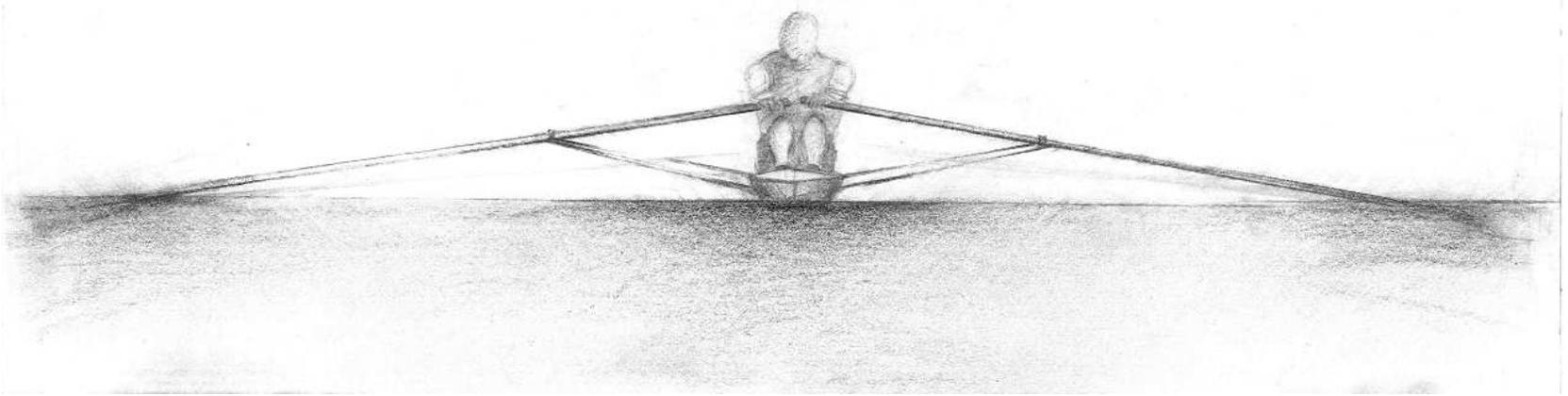
[fig. 47]



[fig. 48]

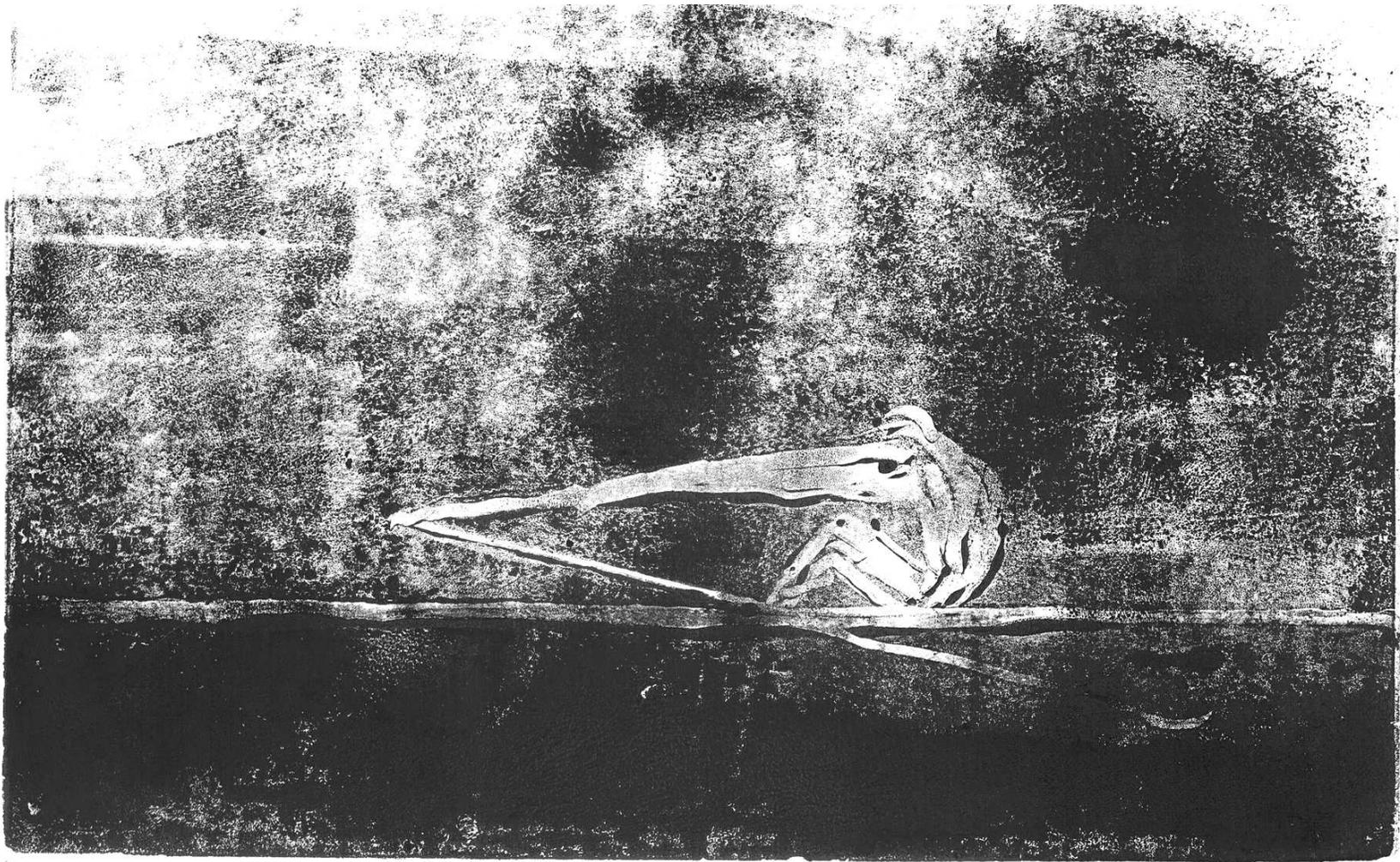


[fig. 49]



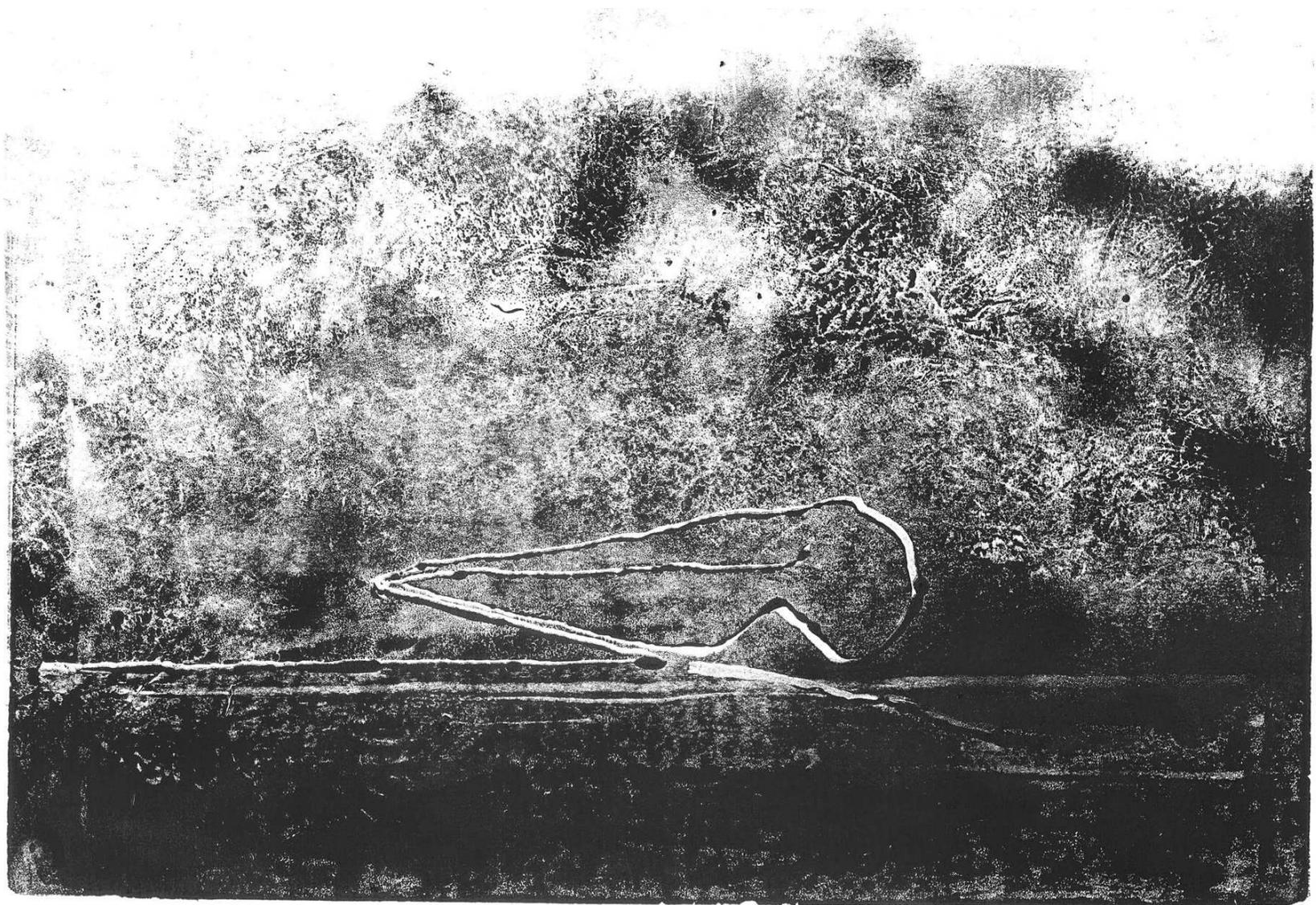
[figs. 46-51] *Rowing Studies*, pencil on drawing paper, various sizes

*The previous six images are from a set of drawings exploring the macro issue of rowing. How is one seated in the scull? How does one feel next to the water? How does the oar link body and boat to water? What positions is the body forced to assume to accommodate the effort of rowing? And perhaps most importantly what does the experience feel like? The answers to these questions are used as source material for guiding the architectural design process.*

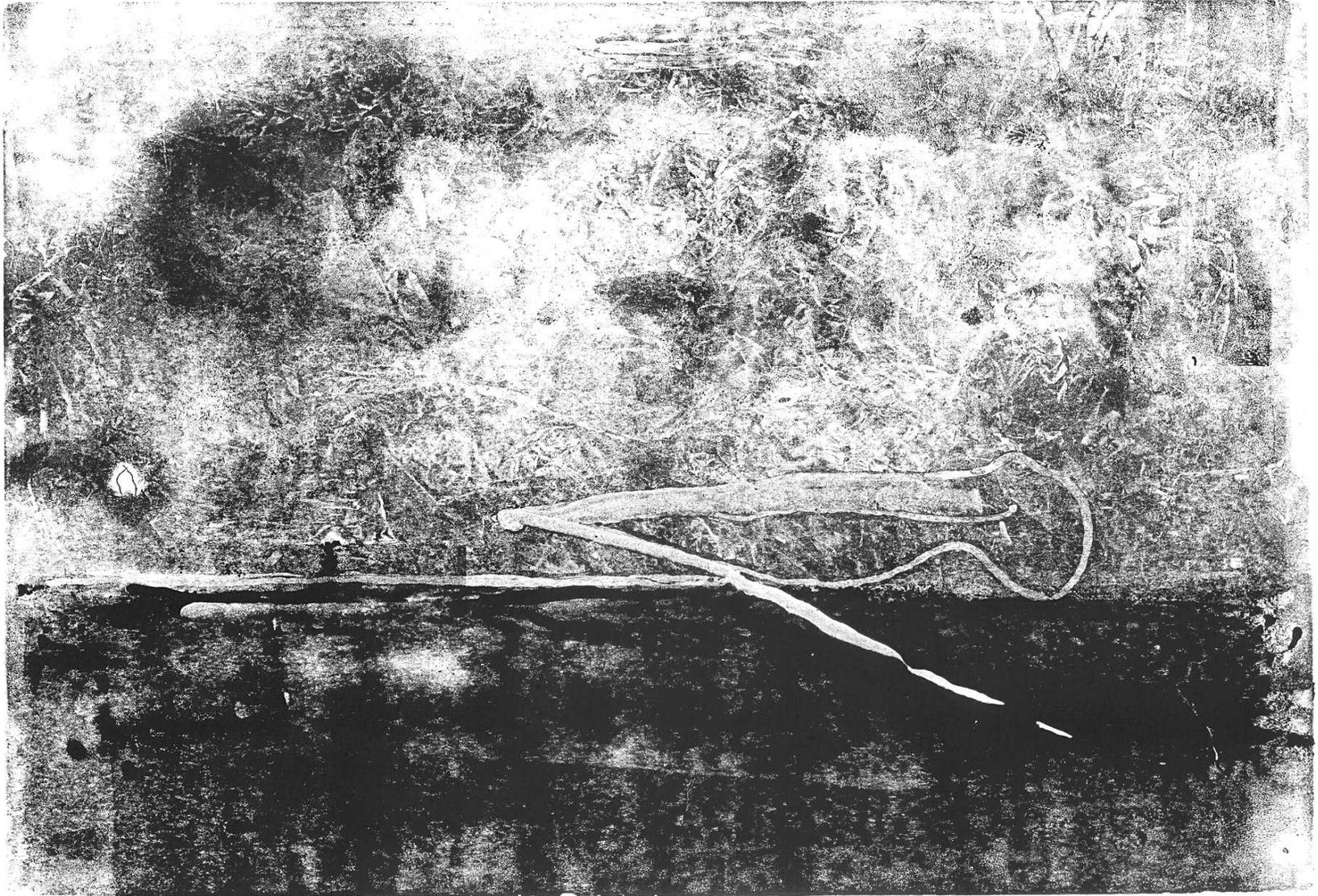


[fig. 52 above, figs. 52-57] *Rowing Studies*, Monoprint, printmaking ink on printmaking paper, 14"x12"

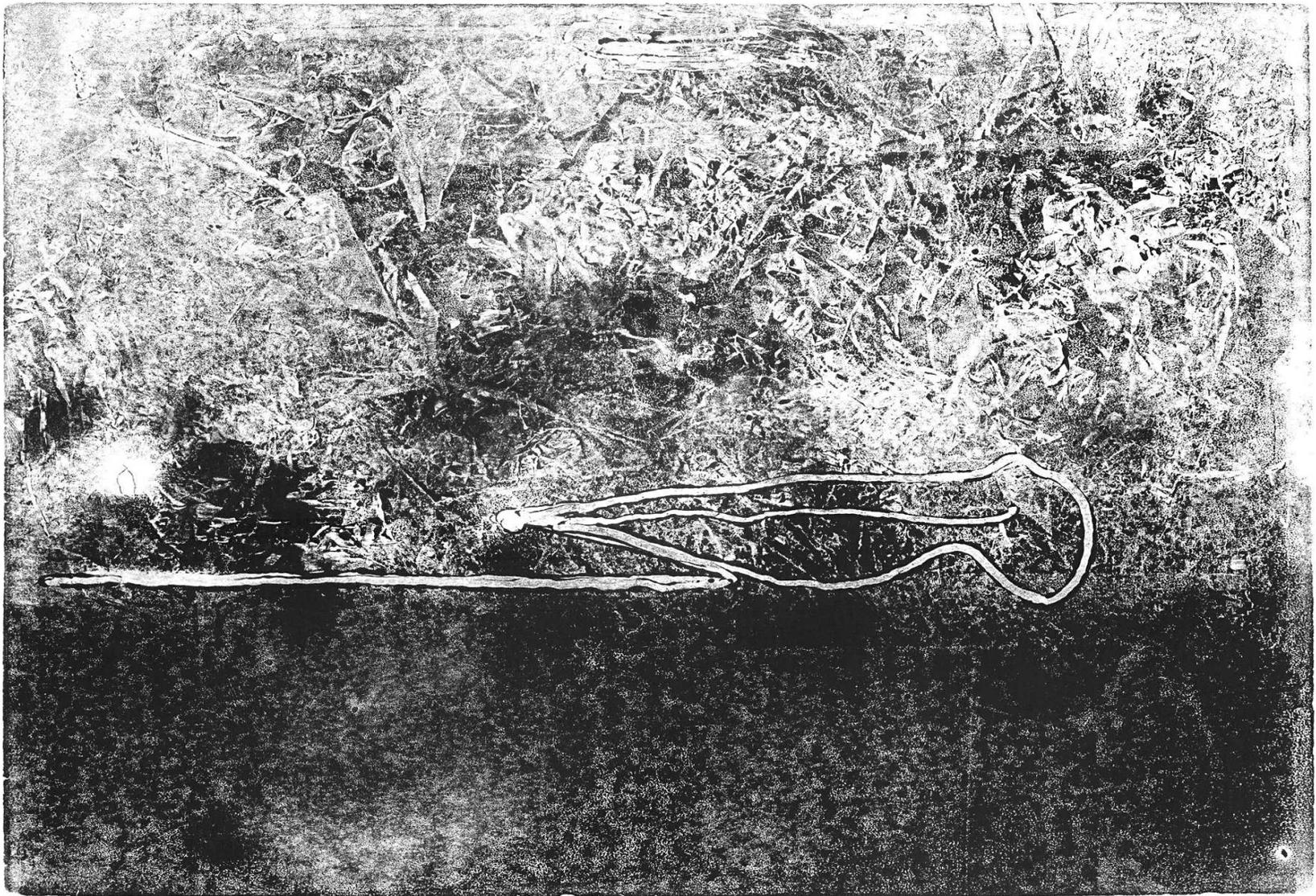
*The following six images challenge the traditional definition of drawing. As the study evolved, the idea of drawing expanded to include printmaking, given that the original marks were made in much the same way as marks are made in a traditional drawing. The media became less important (pencil versus ink); instead, it was the similarity in the making of marks.*



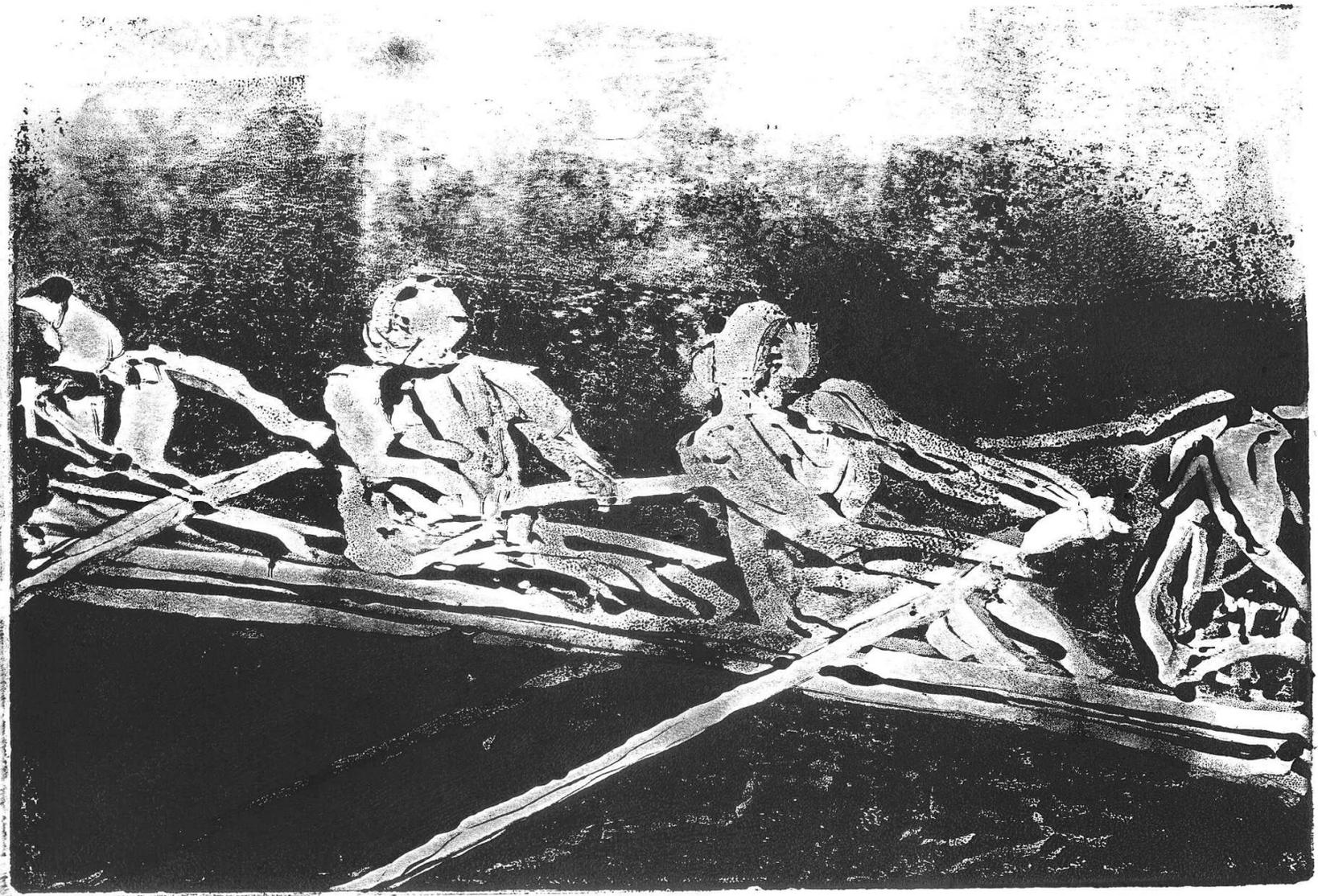
[fig. 53]



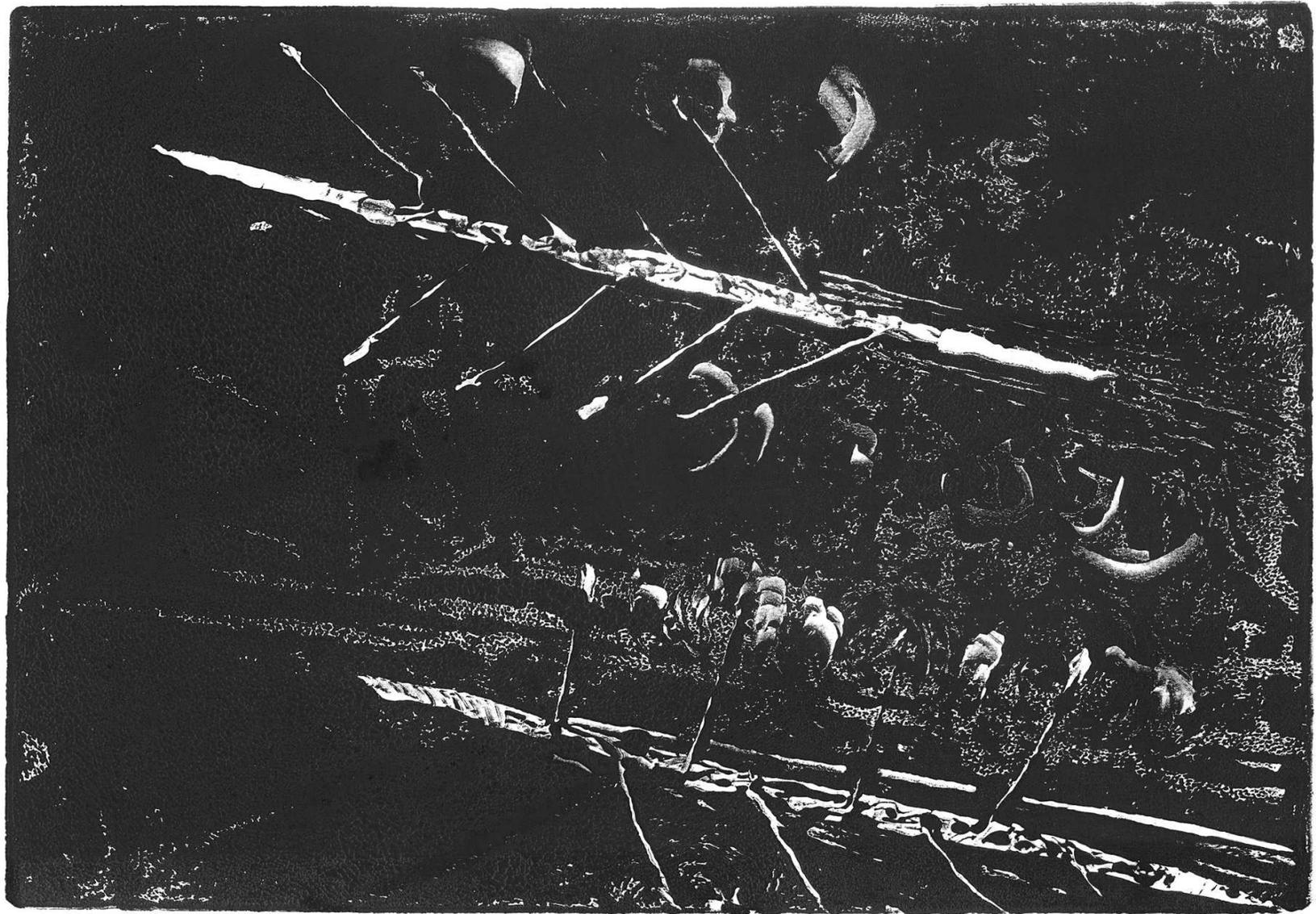
[fig. 54]



[fig. 55]



[fig. 56]

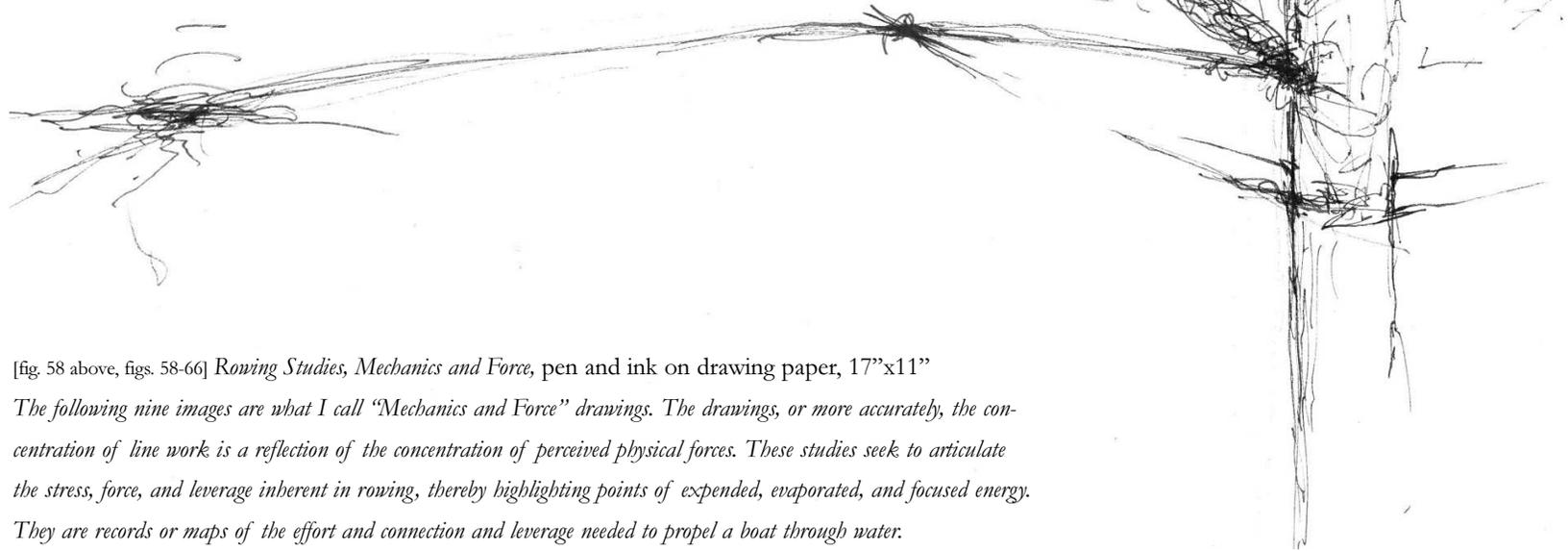


[fig. 57]

As stated earlier, many unsuccessful drawings must be generated before a fruitful effort is captured [figs. 52 thru 57]. On an anecdotal level, my experience has shown that only 15 to 20% of each drawing suite became true grist for the design process, influencing and guiding the direction of the thesis. Conversely, up to 80% of drawings generated went unused or unreferenced. I highlight this point for a very important reason - working this way, discovering ideas this way

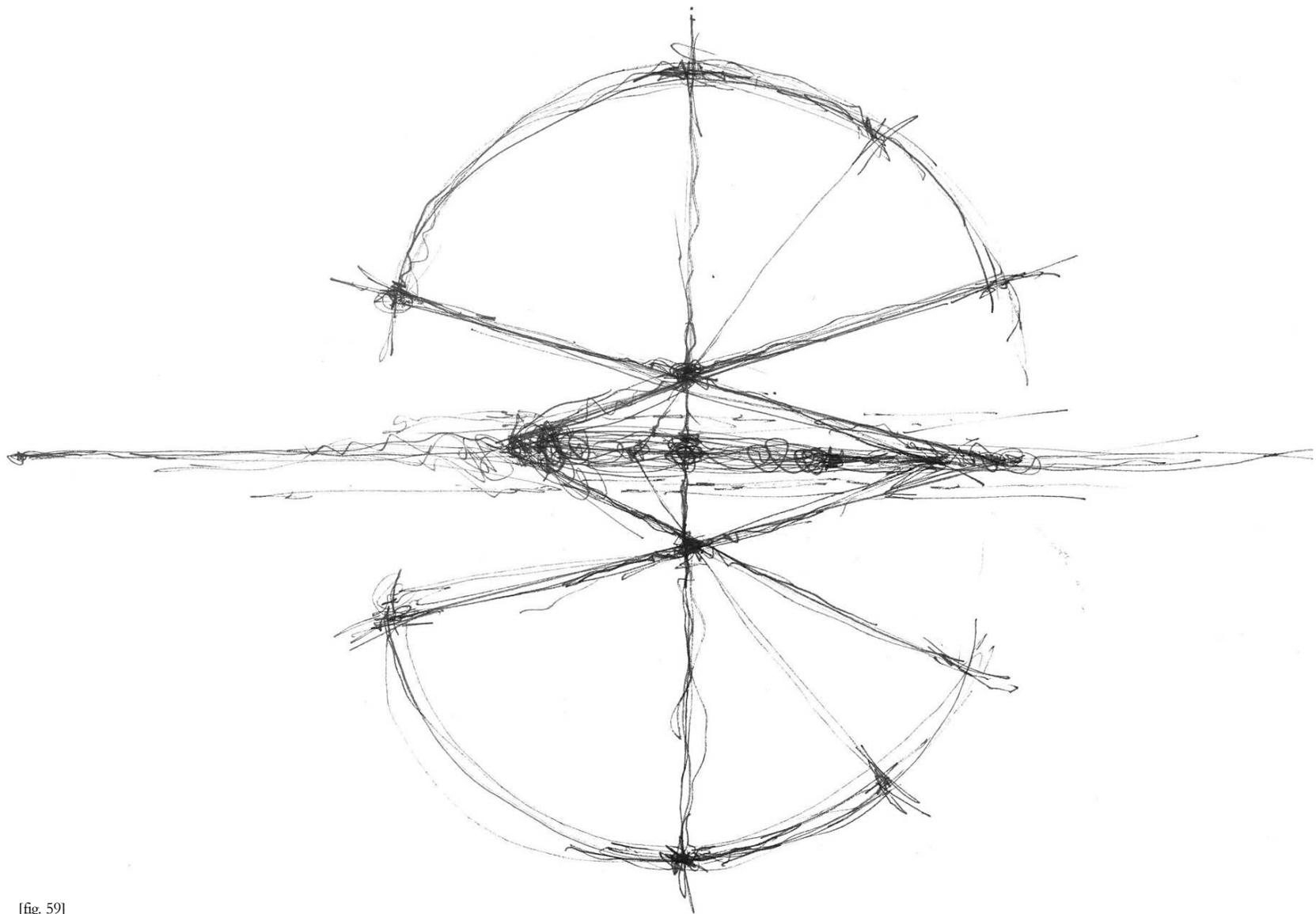
requires a massive production of drawings [figs. 58-66]. Certainly over time, as more drawings were made, an increasingly greater percentage were viable. Repetition made for increasing levels of success. Like many skills, drawing acumen improves with rigor and repetition.

So, the exploration of the Thing itself. The wide ranging scope of inquiry in the following drawings includes examining the notions of  
CONTINUED ON PAGE 57

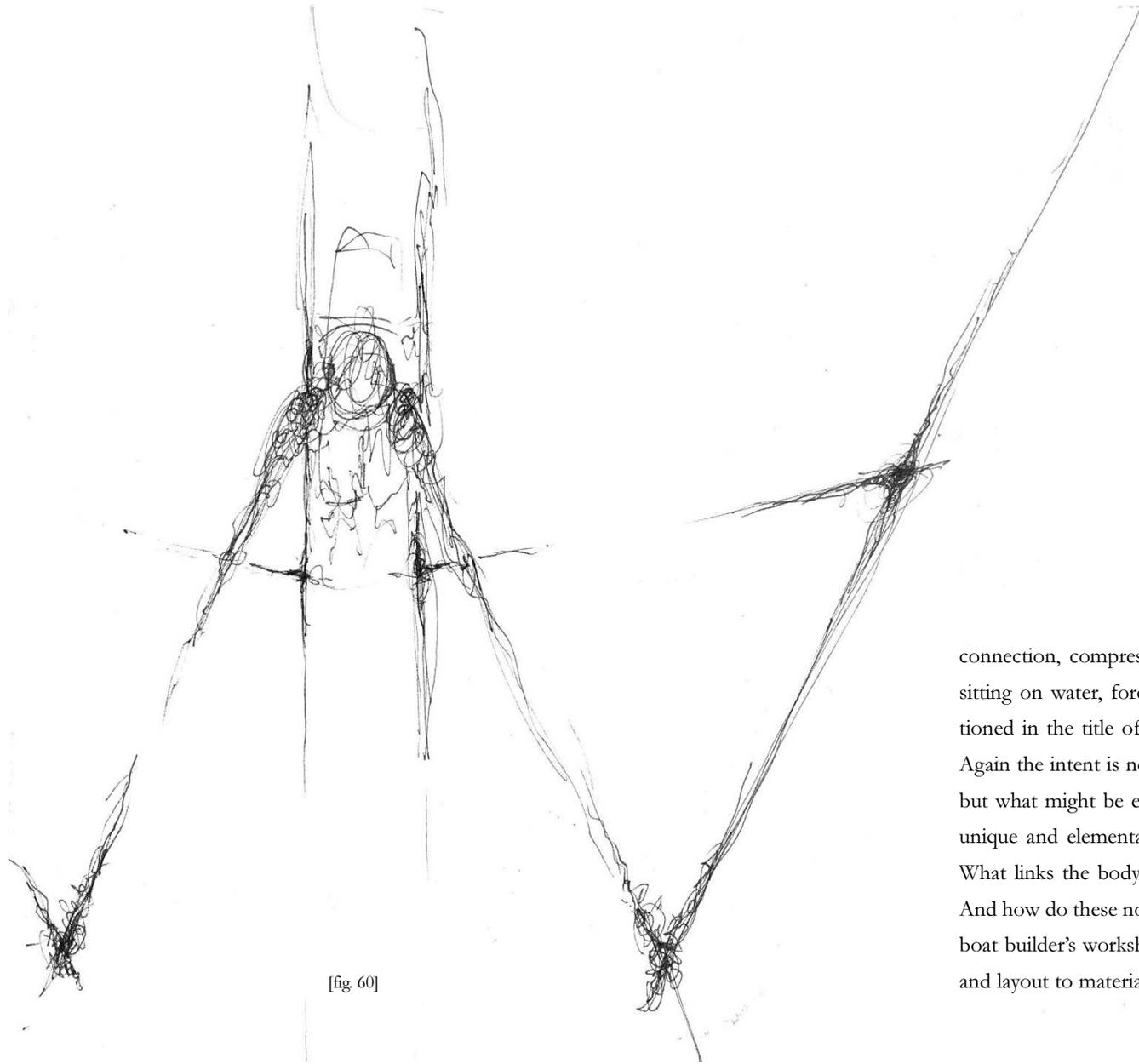


[fig. 58 above, figs. 58-66] *Rowing Studies, Mechanics and Force*, pen and ink on drawing paper, 17"x11"

*The following nine images are what I call "Mechanics and Force" drawings. The drawings, or more accurately, the concentration of line work is a reflection of the concentration of perceived physical forces. These studies seek to articulate the stress, force, and leverage inherent in rowing, thereby highlighting points of expended, evaporated, and focused energy. They are records or maps of the effort and connection and leverage needed to propel a boat through water.*



[fig. 59]

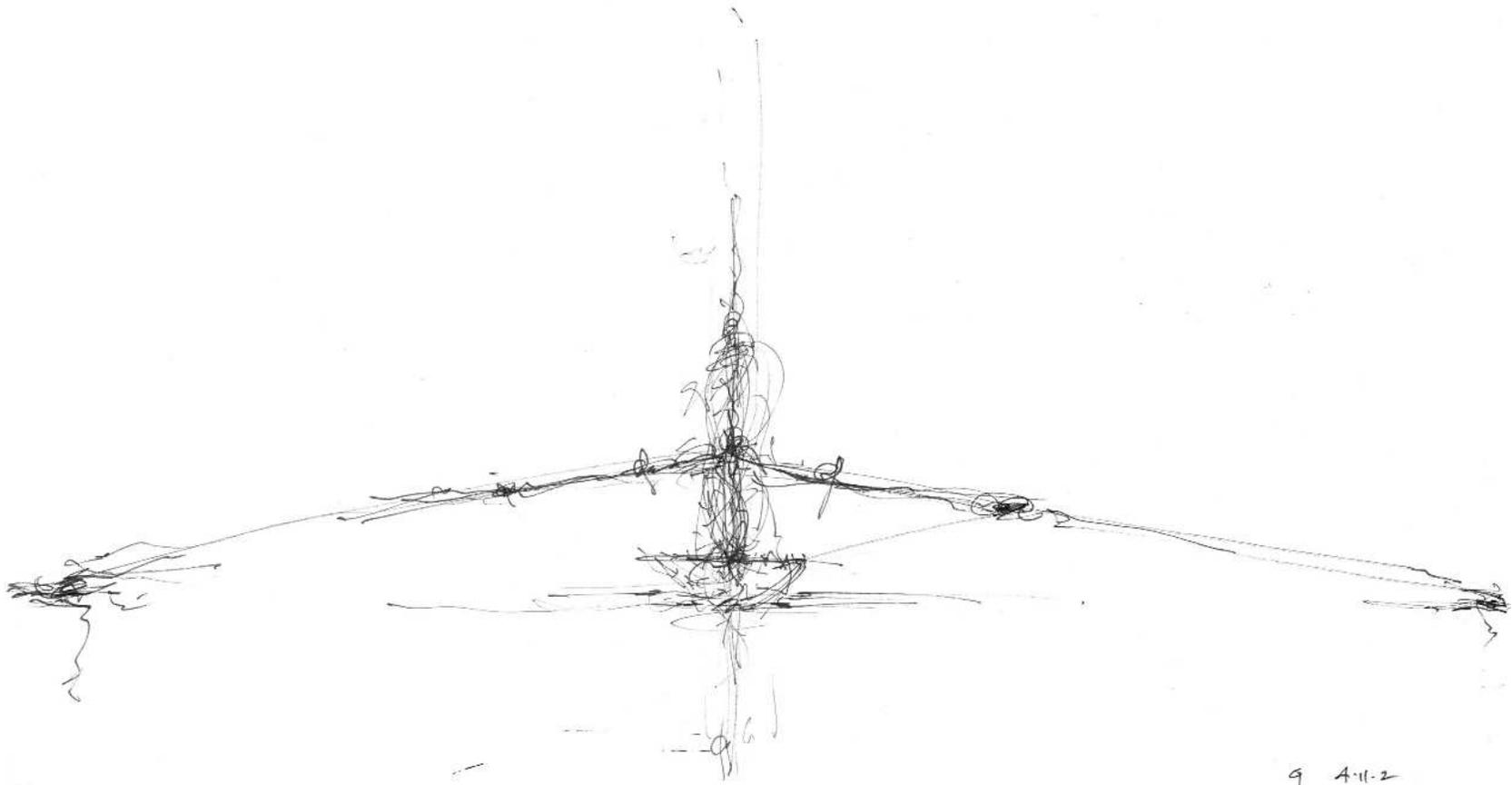


[fig. 60]

connection, compression, extension, gliding and sitting on water, force and torsion, and as mentioned in the title of the drawing suite, fulcrum. Again the intent is not only to draw what is seen, but what might be experienced and felt. What is unique and elemental about the act of sculling? What links the body to scull and scull to water? And how do these notions inform the design of a boat builder's workshop from siting, form, utility and layout to material, light, and sound.

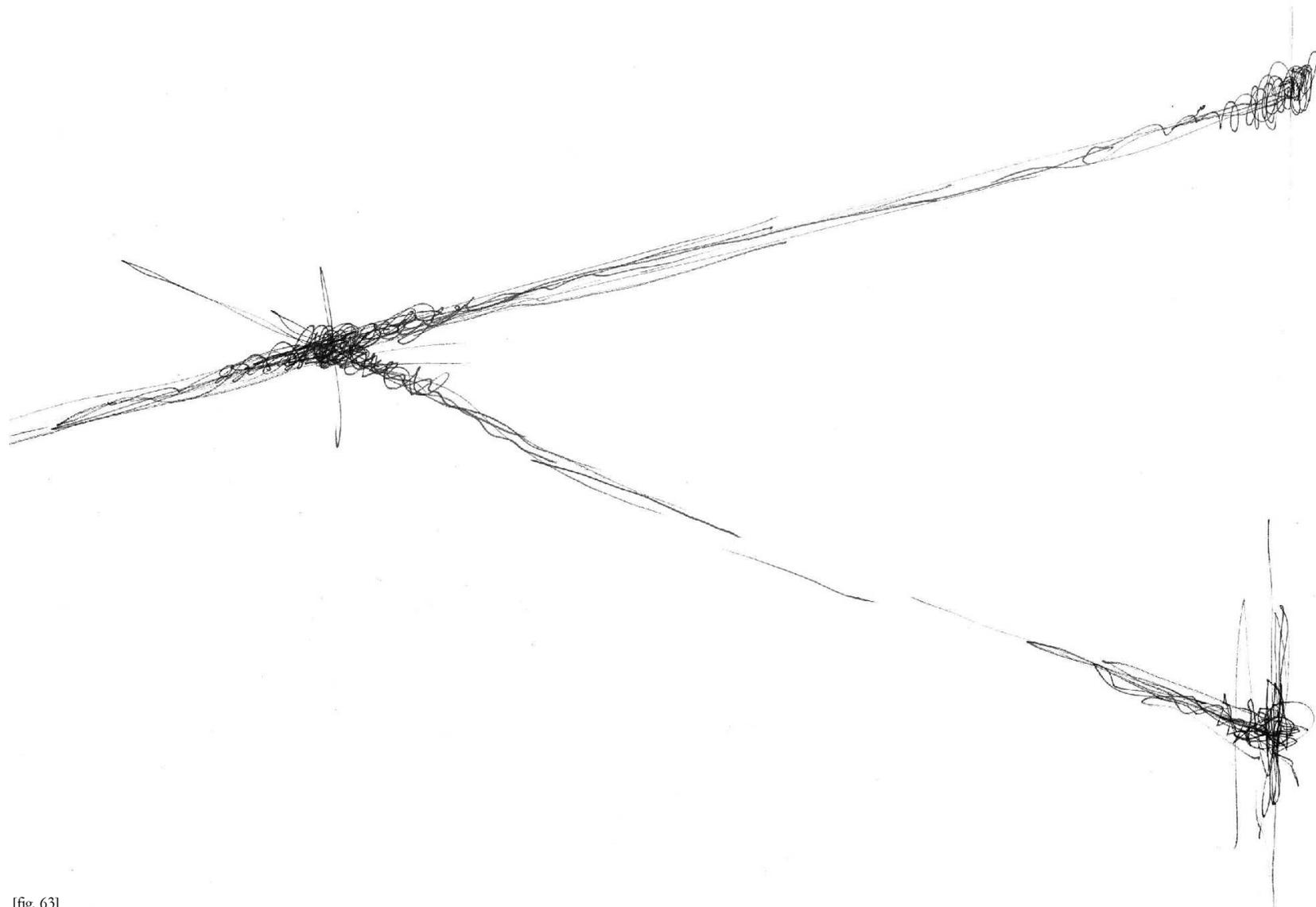


[fig. 61]

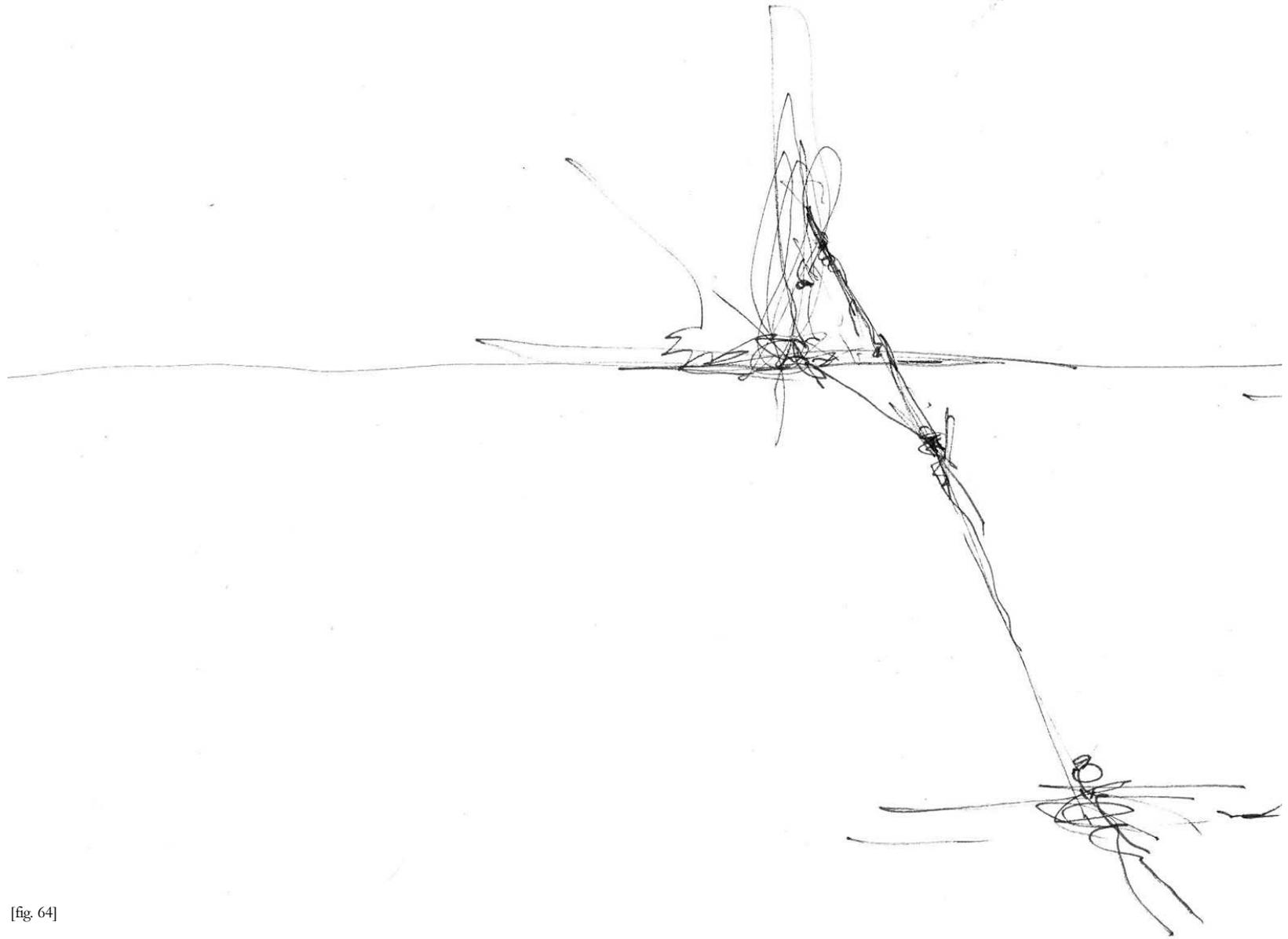


9 4.11.2

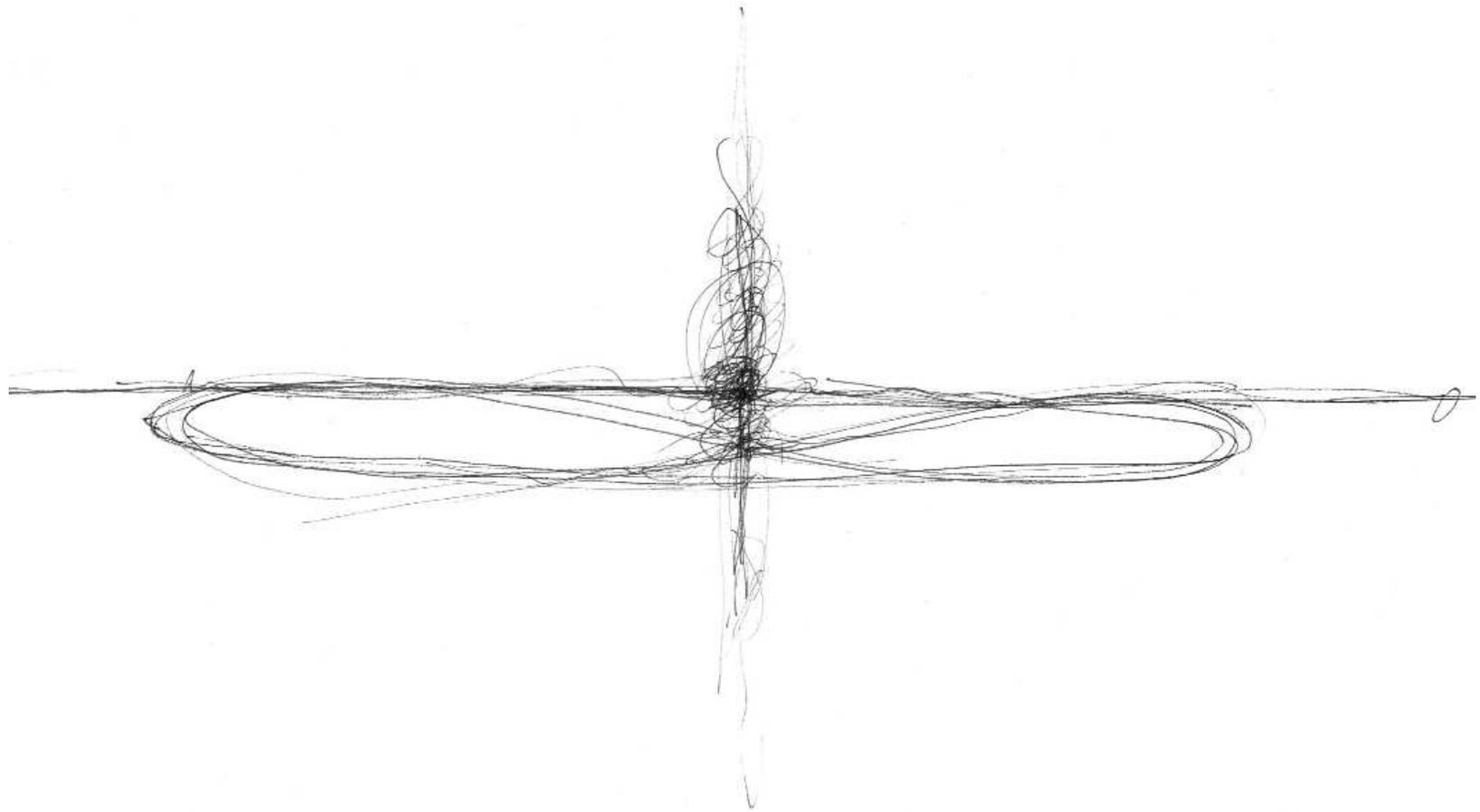
[fig. 62]



[fig. 63]

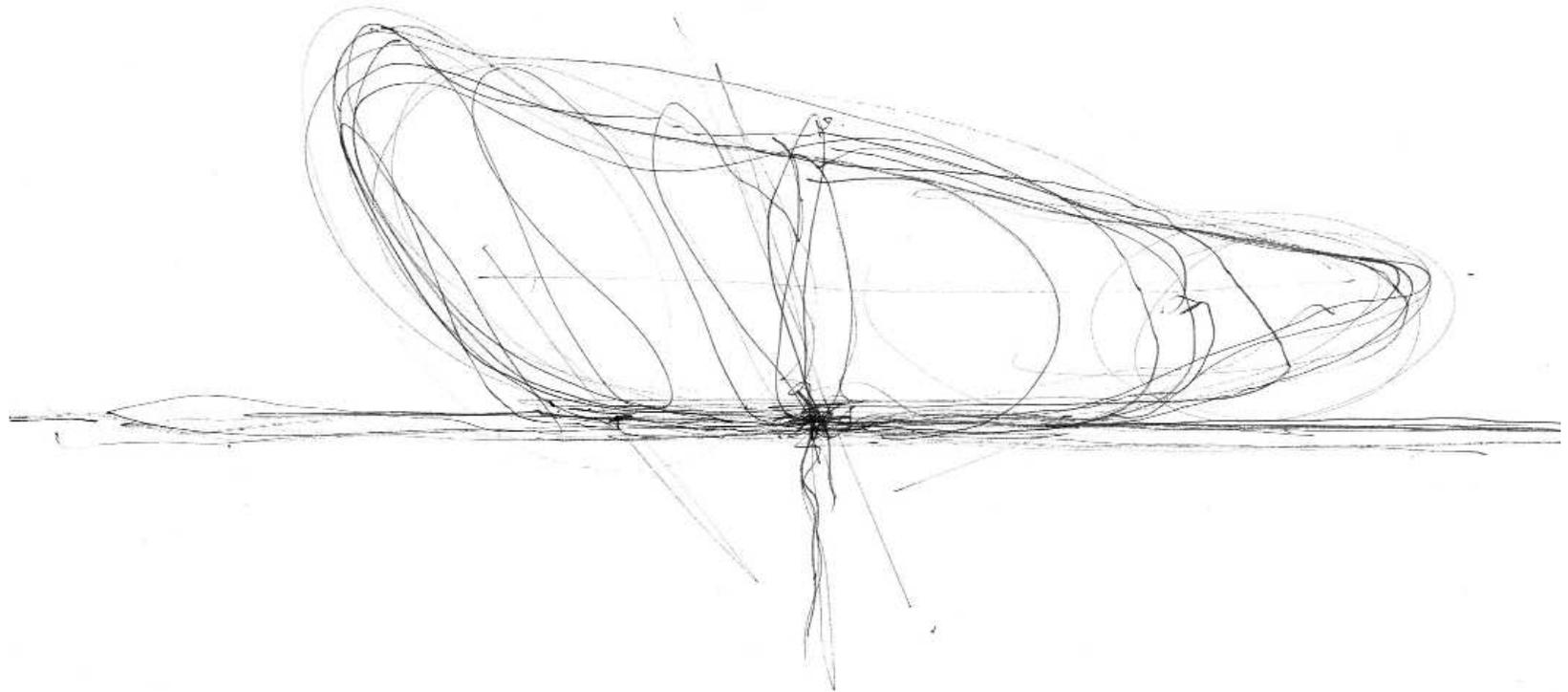


[fig. 64]

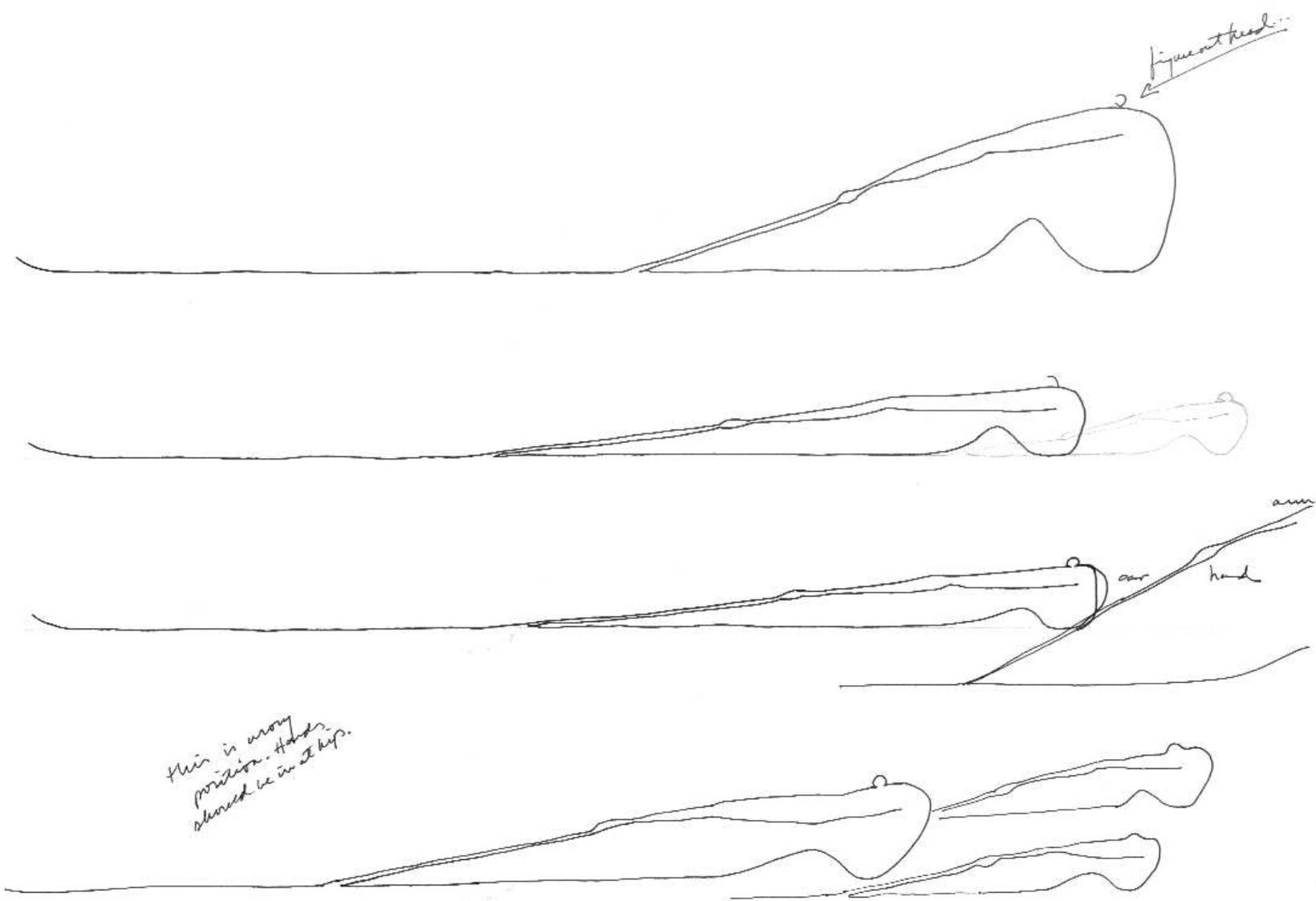


[fig. 65]

C + 11.02

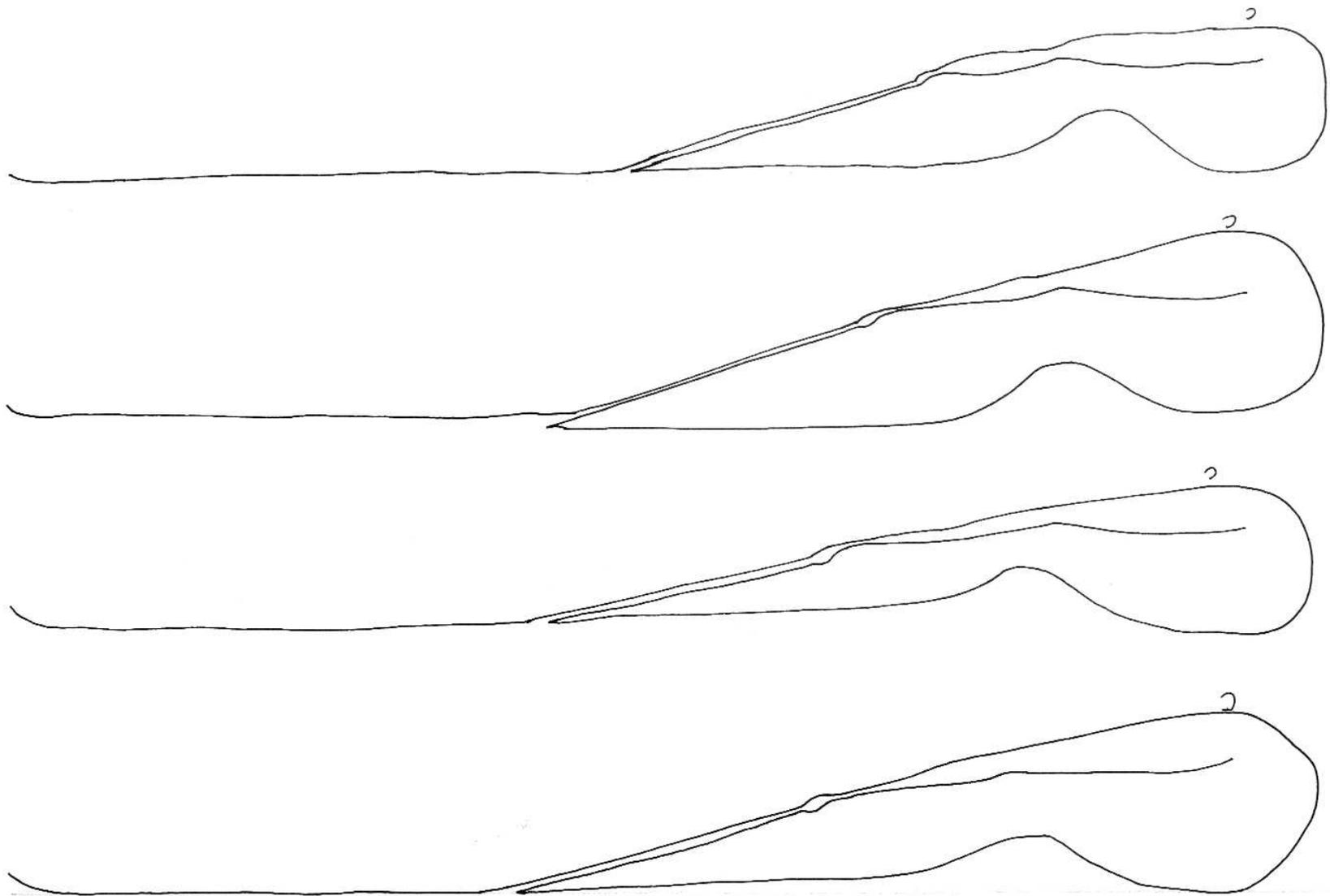


[fig. 66]



[fig. 67]

03.20.02



[fig. 68]



[fig. 69 above, figs. 67-69] *Rowing Studies, Connection and Elongation*, pencil on drawing paper, 17"x11"

*The previous three images are similar in spirit and intention to the earlier Mechanics and Force drawings in that they seek to discover and interpret the connection and forces inherent in rowing. The elongation of the images, the singular line work sprang out of the realization of how rower and scull are intimately and singularly united. At its best, the scull becomes an extension of the body, fusing the rower and oar and scull together in a rhythmic and highly coordinated effort. Figure 69 is the culmination of pages of drawings (of which figs. 67 & 68 are only samples), as I repeatedly searched for the proper method of representation and figuration that would capture this notion.*

*As I worked through this series an antecedent came to mind. It was a drawing I had done one year earlier while on a study abroad trip in Venice, Italy. Figure 70, on the following page, is not only about the connection of boat and oar and water, like the previous rowing study, but in addition, it also attempts to show connection of gondola, canal, and city.*



[fig. 70] *Gondola/Site Study, Venice Italy*, pencil on drawing paper, 8"x6"

*drawing suite 3*

---

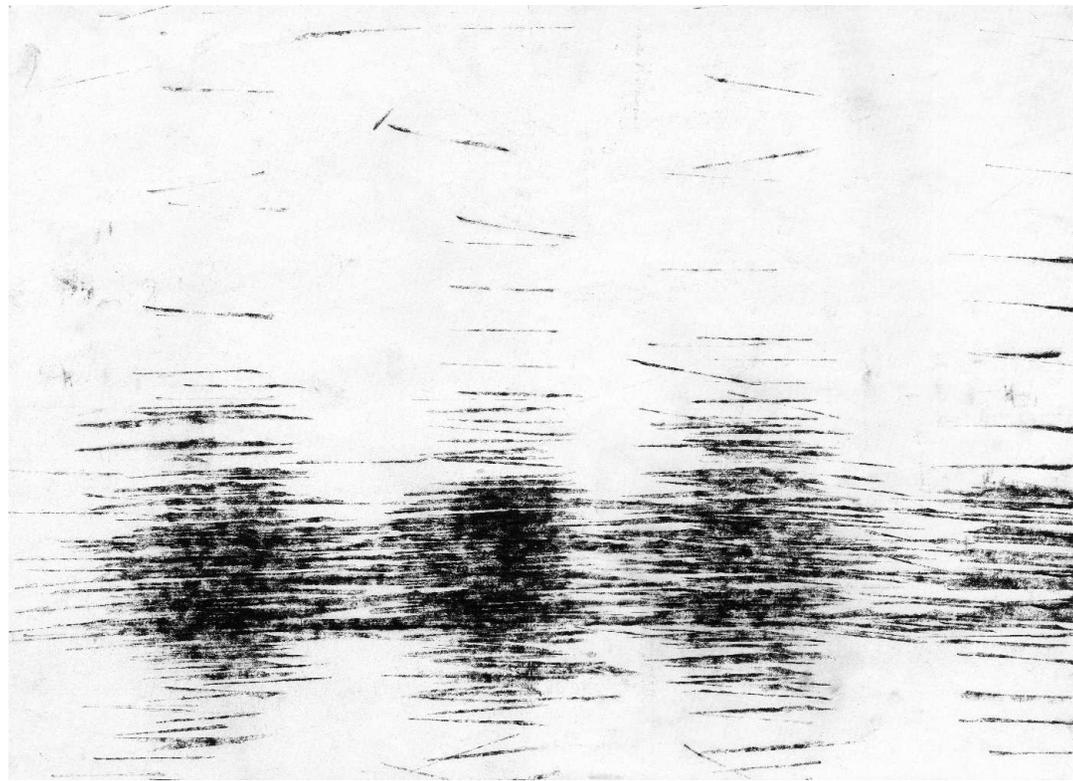
# MEMORY & WAKE

*Of rhythm and repeated pattern*

AS HAS BEEN DISCUSSED IN previous sections, one of the primary challenges of this thesis is for the drawing effort to make evident that which tends to remain hidden. In other words, exploring and revealing the elemental and intangible nature of Things. In this final drawing suite, the focus is on recording the eddy [figs. 71 thru 73], the remnant of the stroke after the oar has left the water, as well as mapping the wake as the hull slices through the water [figs. 74 thru 80].

This is the portion of the study that truly attempts to capture and make evident through drawing that which is mythical and elemental in rowing. Stated another way, the essence of this drawing exploration attempts to bring to the surface the unique and elemental nature of rowing. Michelangelo spoke of releasing form from marble and of draining water from a tub to reveal the inherent structure already present in the stone.

*Surfacing* is perhaps the best word to describe the motive and methodology behind these drawings. However, unearthing the basic components of the sport which make it transformative requires effort. This surprised me - the physical and mental difficulty of working this way. CONTINUED ON PAGE 73

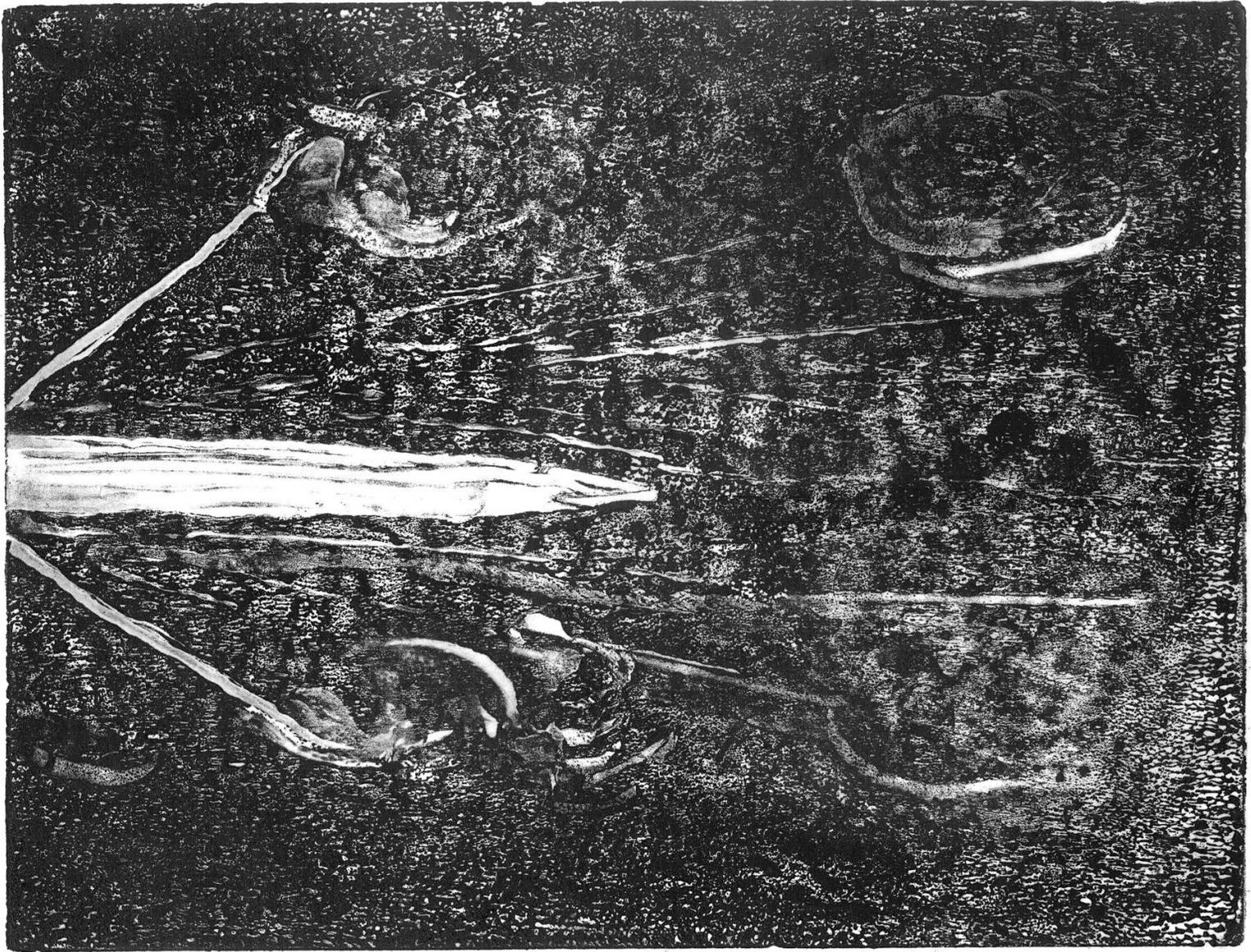


[fig. 71] *Catch and Recover No. 1*, map of a rowing stroke, charcoal on paper, 17"x14"

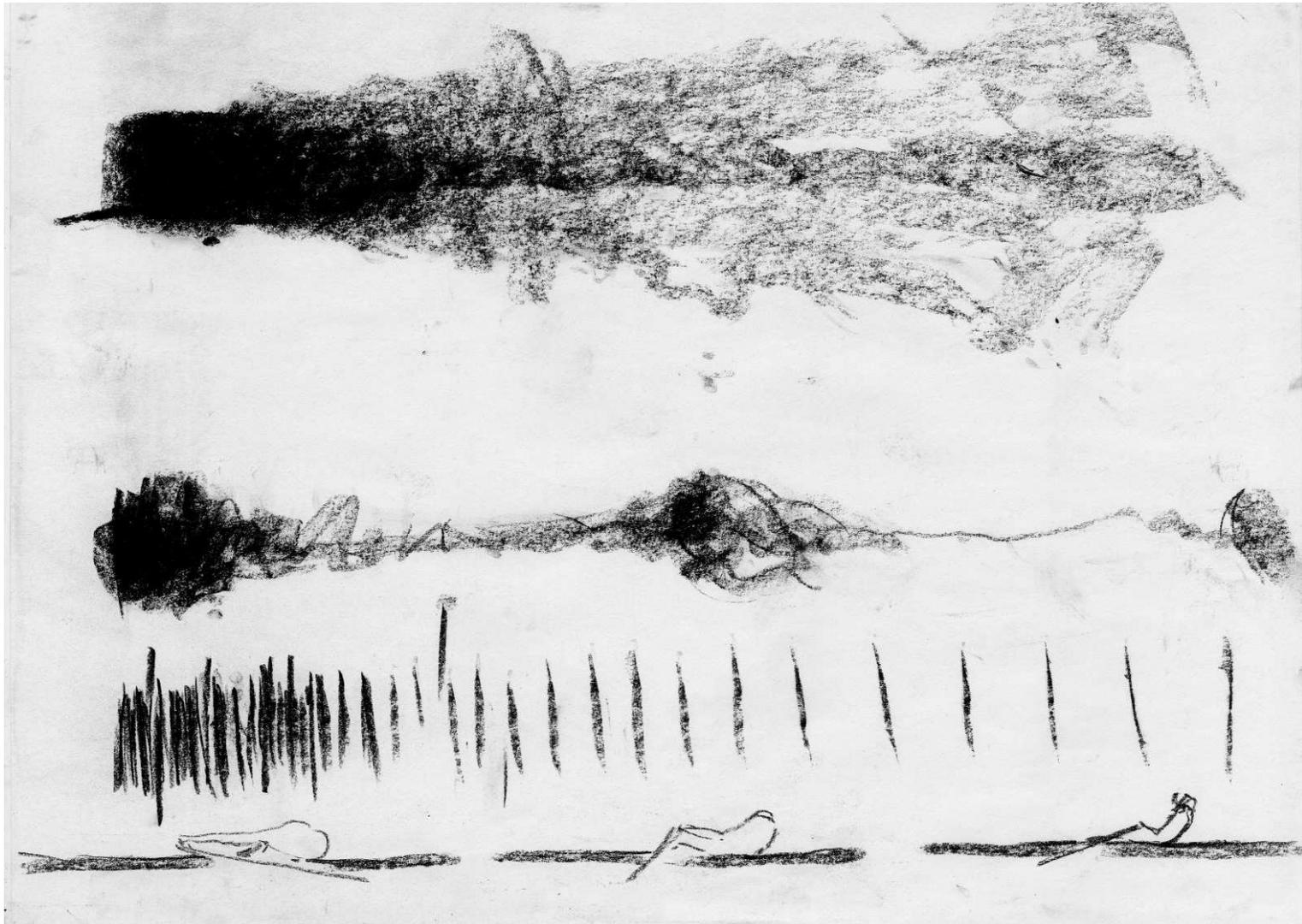
*A common design technique in architecture, something that can help order physical form, is rhythm. This drawing suite searches for such an ordering structure. A powerful rowing stroke is at its core a demonstration of sound technique and consistent rhythm. A proper rowing stroke is a unique structure, a fluid and delicate combination between physical effort and the focus and concentration of the mind.*

[Page 70, fig. 72] *Catch and Recover No. 2*, printmaking ink on printmaking paper, 14"x11"

*What is so compelling and mythical about this study of memory and wake is the notion of a boat slicing through the water, making a wake, leaving behind a residual trace of the effort of having pulled a scull through the water.*



[fig. 72]

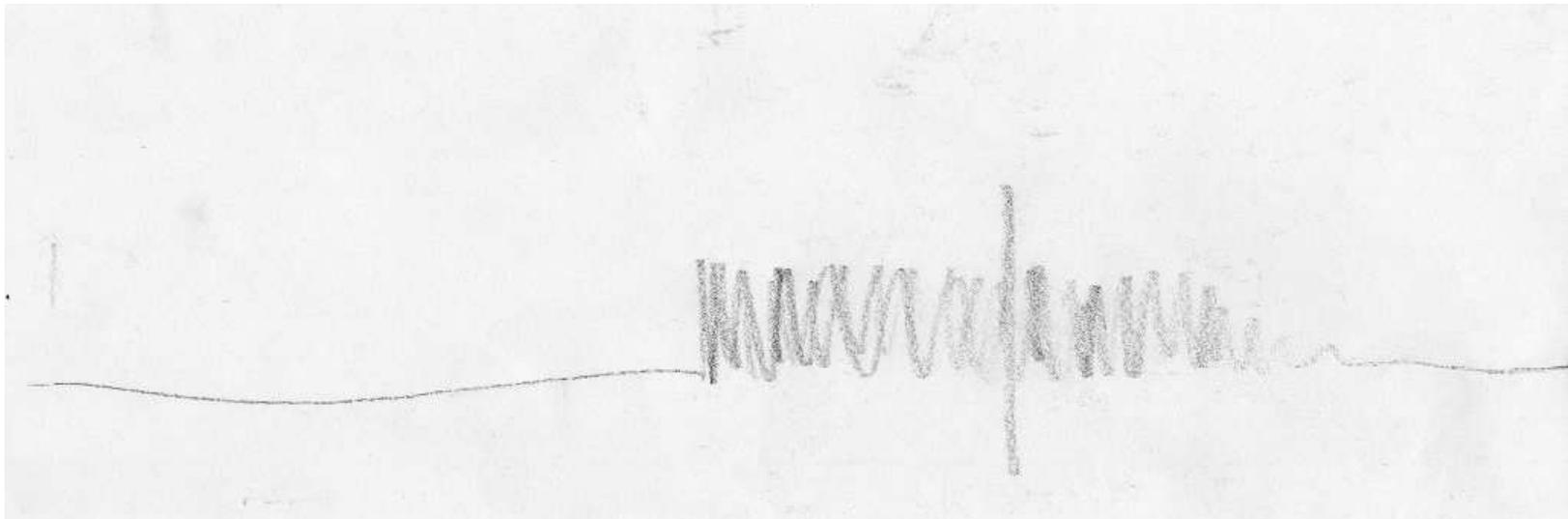


[fig. 73] *Catch and Recover No. 3*, map of a rowing stroke, charcoal on paper, 17"x14"

*Concentration of force and effort evident in a rowing stroke is recorded in with corresponding marks on a page.*

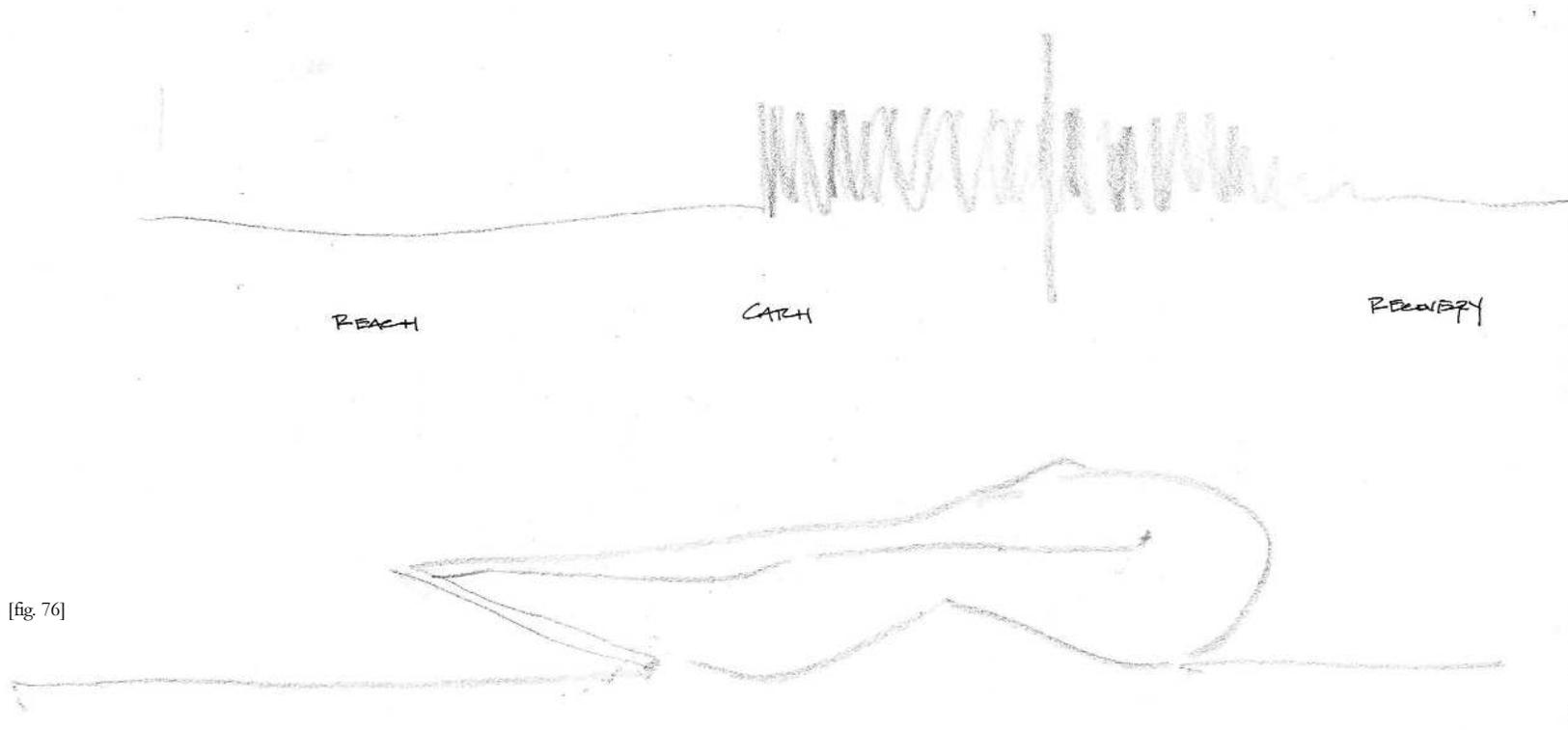


[fig. 74]



[fig. 74 above; fig. 75 below] *Catch and Recover Nos. 3 & 4*, map of a rowing stroke, pencil on paper, 17"x14"

*This drawing sequence was conducted much like a meter reading, a graphic representation of the rhythm of the rowing stroke. The notions of reach and extension, of compact and expanded, of density and paucity are the overriding themes from this sequence. The translation to architecture is seen in a formal logic of opposites - light and heavy, opaque and translucent, compact and open.*



[fig. 76]

This is hard work. It is a process that requires commitment, discipline, and rigor to move it forward. One discovery was immediate and simple, but still rewarding. The demands of an intense and extended drawing effort are closely matched by those required by the act of rowing. What is valuable and rewarding in both pursuits doesn't yield itself willingly or easily. Most of the time it must be pursued and pried. And then, quite unexpectedly, you are occasionally granted an easy and

humbling success, a gift [fig. 57]. It is a gift of buoyancy and rejuvenation. And it is in this small moment that the larger pursuit is validated.

But what questions are pursued? Here are a few that were weaving through my mind as I worked. What is so calming about being on the water? What is so compelling about the tremendous effort required to move a boat and body over the water? Why are people so deeply drawn to an experience that is so internal and solitary, even

lonely [fig. 48]? What invisible link does the sculler have to the water, to the river, and ultimately to the world?

This effort, then, is the most basic of the drawing suites and yet the most difficult to articulate. One of the things made evident by this process is that, much like the act of rowing, the act of drawing is a very personal and highly individualistic effort, whose meaning and relevance might exist only for the individual involved.

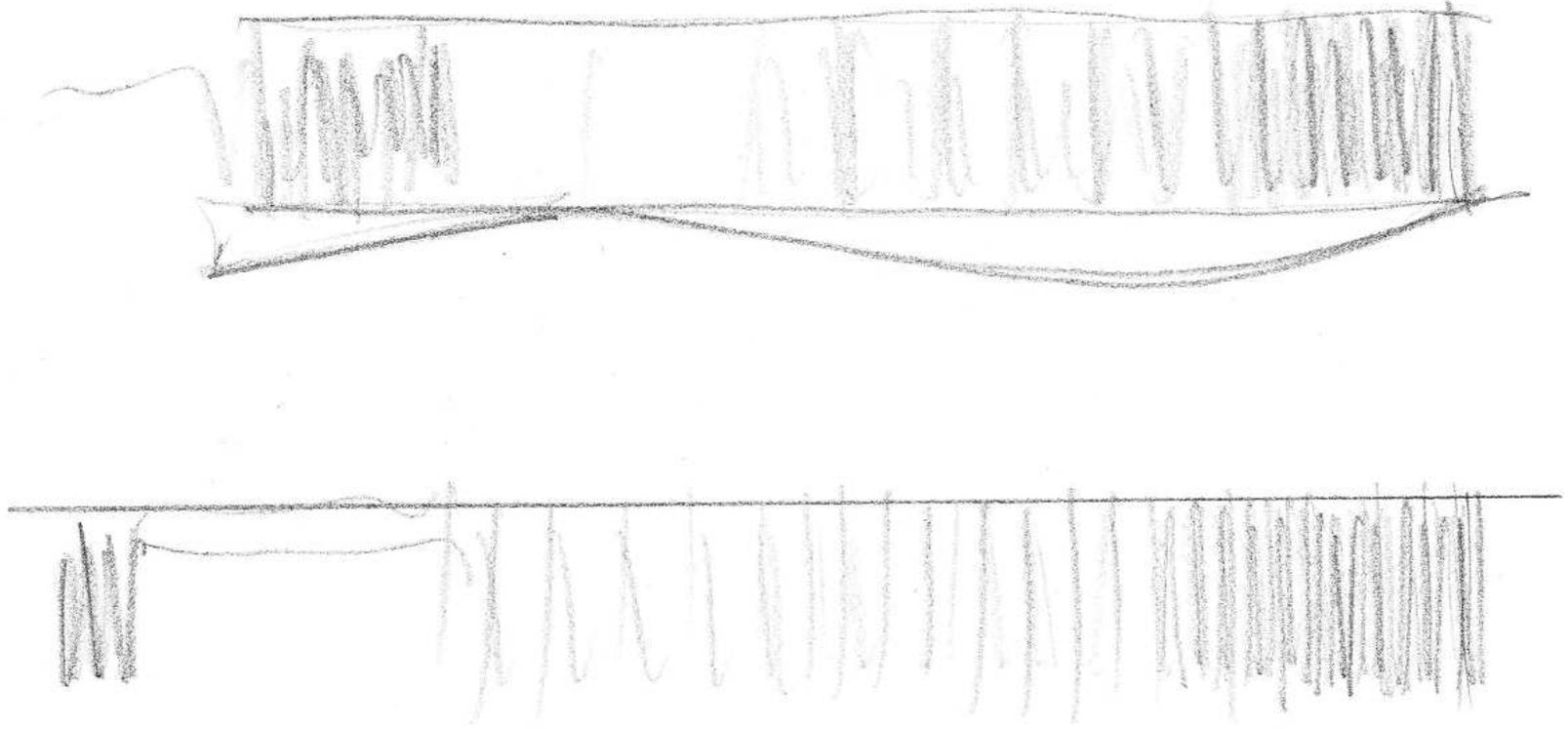
BODY



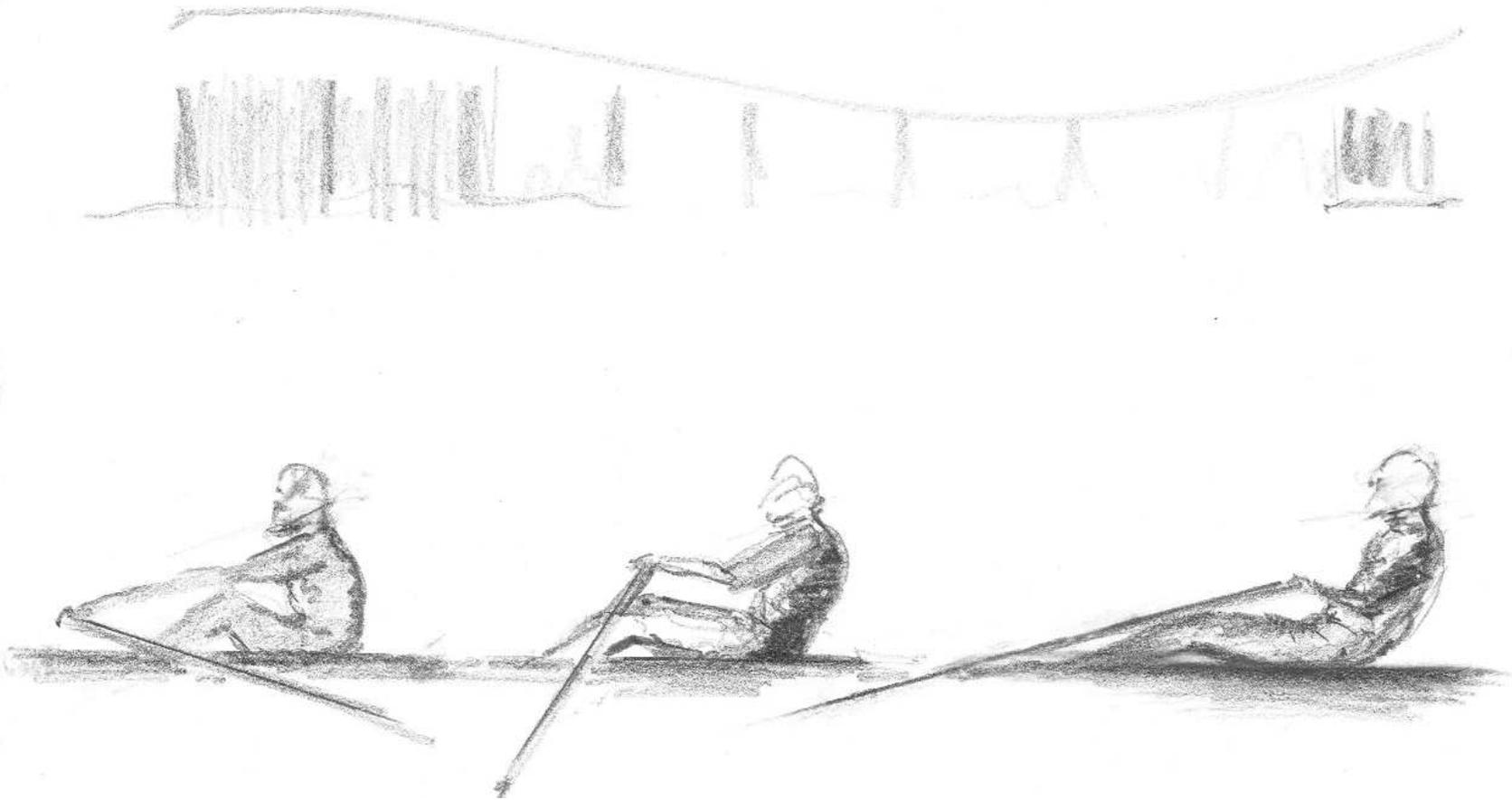
BLADE



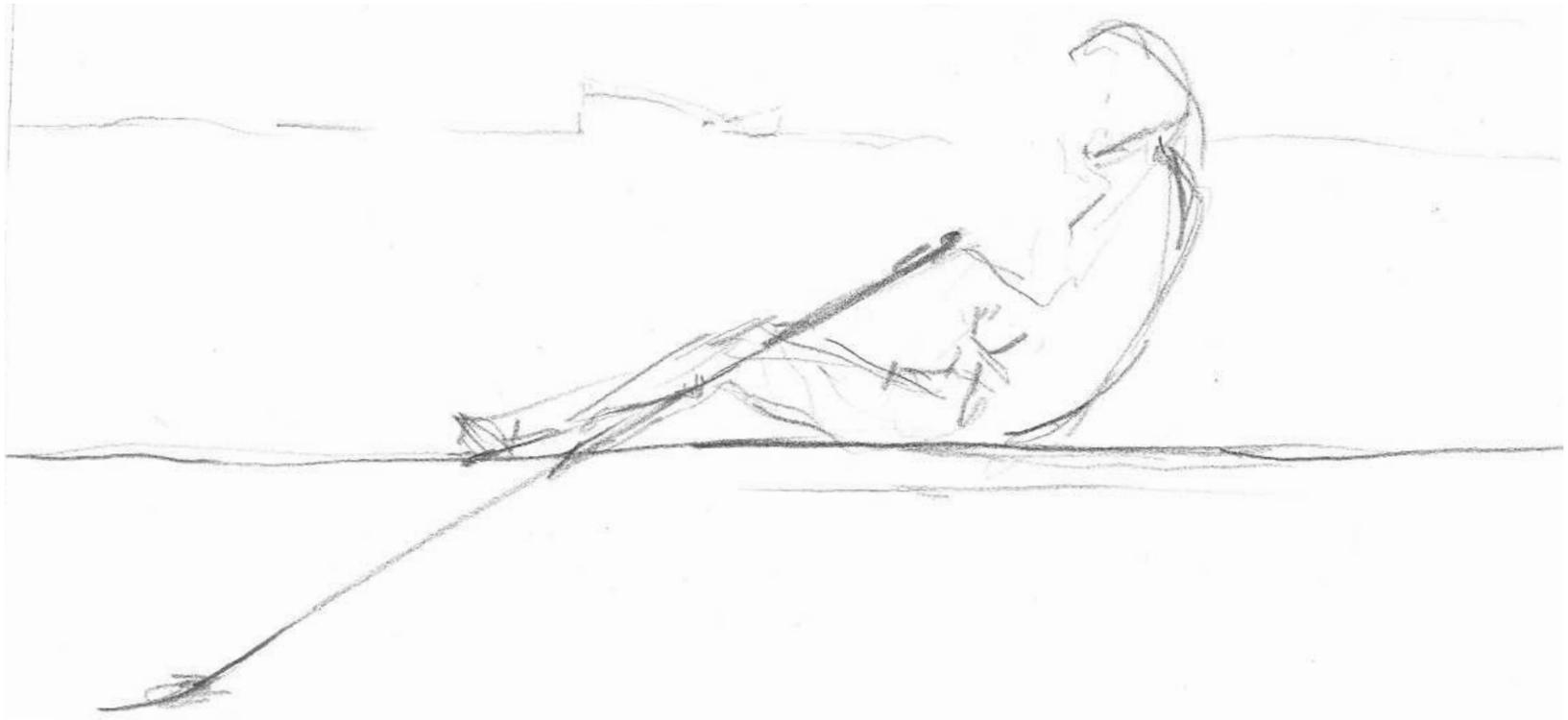
[fig. 77]



[fig. 78]



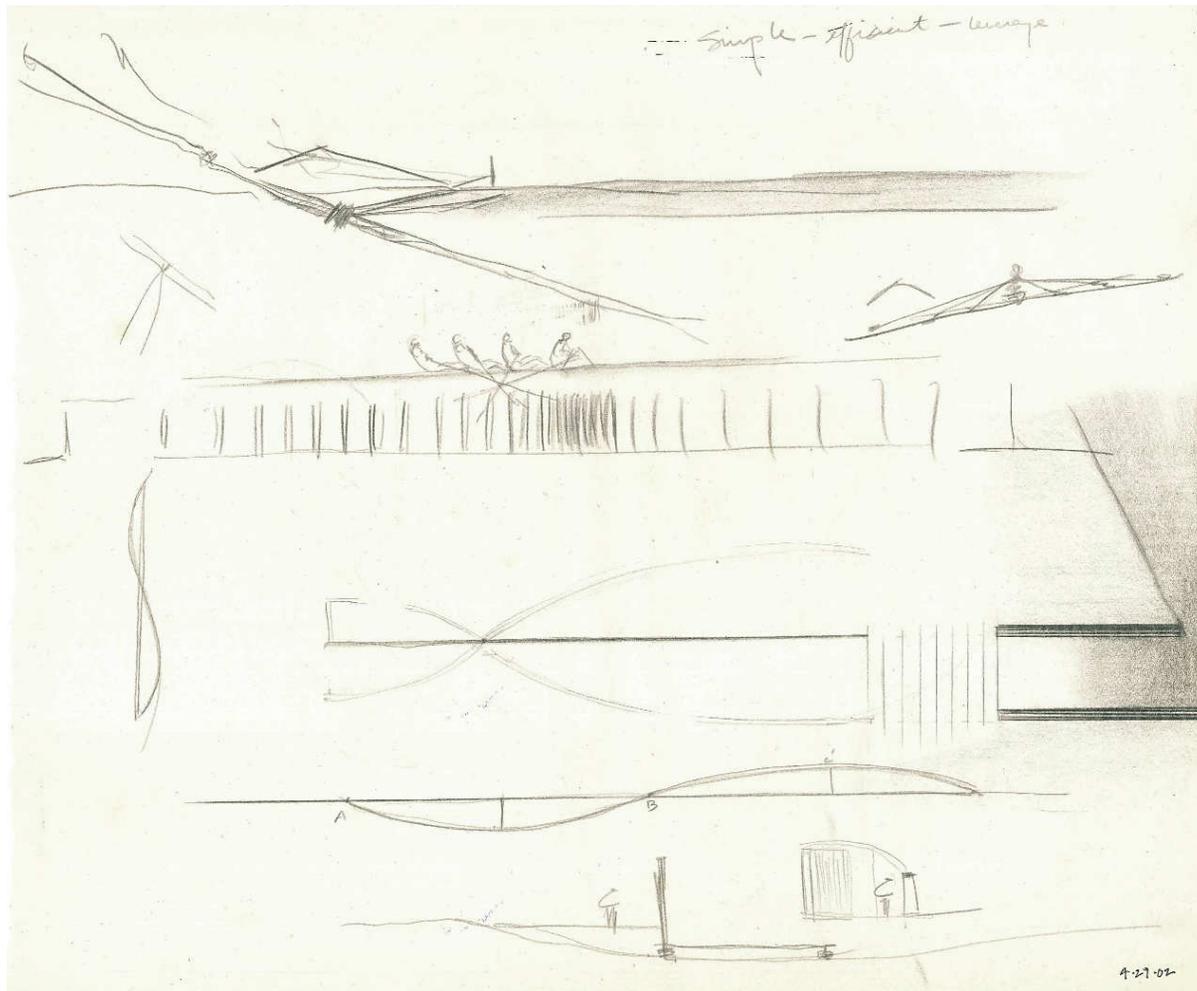
[fig. 79]



[fig. 80 above, figs. 76 thru 80] *Study of Rhythm, A move from Movement to Form* pencil on drawing paper, 17”x11”

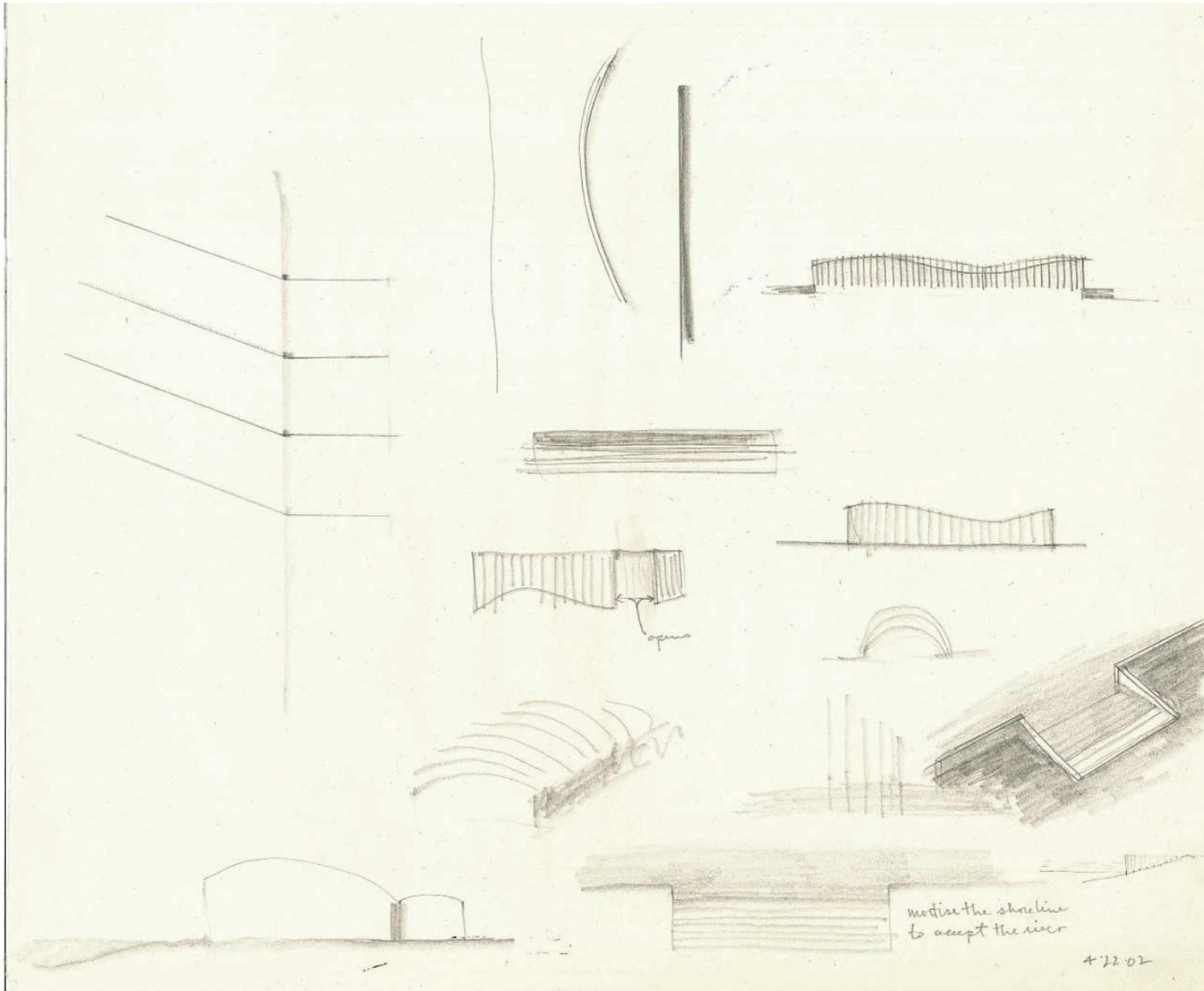
*The difficult leap or transition is to carry the ideas generated in drawing studies into notions about architecture, space and form. The last three drawings are examples that begin to make initial connections between the study of body and boat and architectural form. This is the point at which this process falls apart or begins to yield fruitful and substantial ideas. One of the earliest ideas found in the drawing studies that influenced the architectural design process was that of compression and extension. Figure 72 contains a quick, side-bar architectural sketch above the rower that suggests a building that might be ordered or conceived of as an organic and dynamic structure, reflecting the physical nature of the sport.*

*The drawings that follow in Drawing Suite 3 focus on and examine the issues raised in the first two drawing suites. For the first time the generative ideas from the drawing studies begin to influence and inform directly the idea of building.*



[Above, fig. 81; page 79, fig. 82] *Rowing/Workshop Study*, pencil on paper, 17"x11"

Figures 81 and 82 are examples of "Transitional" drawings, studies that begin to connect more overtly and directly the two topics being examined. Rhythm, pattern, force, compression, extension are now at work within both the rowing and architectural realms. Although the ideas are starting to inform the architectural design process, these drawings are not so much about structure and form, but are instead about order, balance, and logic. This type of study is often characterized by numerous vignettes, quick studies of various ideas or threads.



# PART IV: THE PROJECT

*A translation of multiple streams*

*“There is a place where cerebral and corporeal meet: they call it rowing.”*

BARRY STRAUSS  
“Rowing Against the Current”

AS MUCH AS IT MAY look to this point, this thesis is not strictly a theoretical endeavor. I will test the validity of my position on the drawing process by running it through the filter of an actual architectural project. The abstract must meet the concrete. The concrete, in this case, is a boathouse for a rowing club.

The project of boathouse is one that began to surface after I had started the exercise of drawing the door hinge (the specifics on the role of the drawing exercise were be covered in PART II). The rigor of the exercise (drawing the door hinge

everyday) interestingly enough demands a certain level of isolation. An extended period of drawing is a solitary event. It is also very draining. The strain of drawing every day, both mental and physical, began to remind me of the fuller meaning of the word *exercise*, a meaning that included in its definition the notions of training, conditioning, and action. In a word, drills. The routine of drawing brought about the idea of rowing and consequently the idea of boathouse (a wonderful testament to drawing’s ability to suggest and generate ideas). Initially, I imagined the boathouse to be a

private outbuilding on a residential property. But the program has evolved and been broadened in scope to be a boathouse for an urban rowing club. Rowers, scullers and shells; singles, doubles and quads. These are some of the technical terms of the sport and I will use them throughout this section.<sup>1</sup>

Before I get into the pragmatic issues of program, I want to spend some time articulating what I see as the poetics of this program [fig. 83]. The two quotes that follow in this section are very different in how they describe the sport of rowing.

*A single [shell] is very tippy. It's an inch or so wider than your hips, and it's 27 feet long. You're sitting on a log, essentially - it's not made for turning, just going straight, fast. If your oars aren't together, if you try to muscle [the shell], you'll find yourself in the water. It takes a lot of discipline, and sometimes it's lonely.*

CATHY KEMPER, "Rowed to Success"<sup>22</sup>



[fig. 83] *Rowing Study*, pencil on drawing paper, 18"x6"

*I yearn for the beauty of the inlet at dawn. I miss the smell of varnished wood in the boat bay. I miss the sight of the dock disappearing in the horizon. I miss the sound of blades slipping in and out of the water. I miss the touch of the long, long pull from bow to stern. I miss the ghost fleets of ancient Greek ships. I miss the herons. I miss the crisp mornings on the water in the October sunlight. I miss the nervous confirmation of racing. The inlet is waiting.*

BARRY STRAUSS, "Rowing Against the Current"<sup>23</sup>

THE FIRST IS A QUOTE OF Cathy Kemper, an international caliber Masters rower who has been rowing for more than 25 years. The second is a quote of Barry Strauss, a professor of history and classics at Cornell University who came late to rowing, when he was in his forties. The different tone in the quotes highlights not only the different personalities of the two people quoted, but also the sport's paradoxical nature. Rowing is at once graceful and brutish; it demands the most from both mind and body; its history's been written by Ivy Leaguers and blue-collars; it's at the same time elitist and democratic; and its rhythms are simultaneously lyrical and technical. It's poetry lies in the tension between effortlessness and effort. Rowing demands scullers be equal parts piston engine and romantic hero, souls who finds companionship in the struggle and peace on the water.

When I first read Cathy Kemper's quote, a couple of things struck me. Again, the paradoxical relationship existent in rowing, where a premium is placed on a rower's ability to achieve a Zen-like balance between the way of the body and the rule



[fig. 84] *Rowing Study*, printmaking ink on print making paper, 12"x14"

*This print is part of a series titled "Memory and Wake" (see also fig. 57) which explores the eddies, or marks, left behind as a record of the effort needed to move a scull thru water. There is something quite beautiful and elemental about how the water receives the oar and maintains a trace of the stroke as a slowly dissipating pattern. Seen from above, one can imagine a map being laid out as the scull makes its way up the river.*

of the mind. The other thing I noticed was the last word in the quote, the word *lonely*. There is something isolating [fig. 84], distancing and fiercely individualistic about rowing. In large part, the solitary nature of rowing seems to draw people to the sport; but it also repels them.

Perhaps, because he is a professor of the classics; perhaps, because he found a passion for rowing later in life; perhaps, because he has the spirit of a poet; whatever the reason, Barry Strauss's passage has a decidedly different tone, a mythical tone. With Odyssean drama (appropriate, since Cornell University is in Ithaca), he speaks to the lure of the water, the draw of boats, and the beckoning that has led countless individuals and dozens of cultures to sea. For passionate rowers, there is a quiet call, or more accurately, a siren cry that must be obeyed. It seems no accident that oarsmen row facing backwards, gazing into the past, sending a swirl of black-oared water to mix with the mysteries and the churn of Egypt, Greece and Rome.<sup>4</sup>

THE SPORT OF ROWING and the history of boathouses is as rich a subject for design as any I can imagine. They will serve as a fertile field for exploration. And in the spirit of the hinge drawing exercise, so too, will the drawings for the design project seek to capture and manipulate the essence and intangible nature of both rowing and boathouse<sup>5</sup>. What follows are various programmatic parameters that will shape the design of the thesis project.

NOTE: *What follows is the initial program for the thesis. Ideas suggested during the drawing effort redirected the thematic focus toward a much simpler, pared down version. What was a large boathouse for an entire crew team has instead become a boatbuilder's work shop for a single artisan. The*

*description of this space was part of the original thesis and is described in the section, "Rigger's Bay". Though outdated, this original programmatic description remains in the thesis as a record of the impact the drawing effort had on the scope and direction of the project.*

#### PROGRAMMATIC DESCRIPTION

There is an opportunity in this project to pursue a situation where the nature of the activity (rowing) [fig. 85] can dramatically influence and shape the nature of the spaces. In concordance with the paradoxical nature of rowing, a corresponding contrast will exist between programmatic elements and spatial qualities. As much as grace and brute force co-exist within rowing, as much as poetry

and technique serve one another in the stroke path of the oar, so too, will elegant and utilitarian spaces co-exist within the building. Delicate, calm, and silent spaces will house activities which require preparation, reflection and anticipation - a readying of the mind for the coming challenge of the body. In opposition, spartan, solid, and functional spaces will facilitate activities intended for training, exercising, and instructing. The boathouse is linked to the spirit of Greek *gymnasium* and *palaestra*, where both body and mind are challenged, wrestling side by side. Mind and body manifest in program.

#### THE BOATHOUSE

The "mind" portion of the program houses the



[fig. 85] *Scull*, photo courtesy of Eric Whittington  
*An "8" from the Cambridge Rowing Club out on the Charles River, Harvard University.*

boathouse proper, a place of anticipation, transition, and transformation as rowers gather, prepare to enter the water, or return from time on the river. It is a large, simple, elegant space where shells are stored, launched, or repaired. A full two stories, it's open and uninsulated; structural members in the walls and the ceilings are light wooden ribs, exposed and unadorned. Though structurally elegant, it is materially spare, puritan, helping to minimize building costs and future maintenance. It is made primarily of wood. Walls are not thermal barriers. The temperature is the same inside as out, altered only by the sheltering property of the structure. And, for the most part, the space is dark and still, illuminated indirectly - by diffuse light from clerestory windows above, by thin bands of light coming through slatted walls,<sup>6</sup> or by direct light entering through the boat bays. Calm and contemplative, this space is the boathouse's link to the water, with rower's looking out through the evening lit room onto the bright flowing river.

#### RIGGER'S BAY

Integrated within the boathouse is a rigger's bay or a shell builder's shop. This is the workspace where shells are built or repaired [fig. 86]. It is a traditional shop where wood is still used for boat build-



[fig. 86] *Rigger's Bay at the Cambridge Rowing Club*, photo courtesy of Eric Whittington

ing. Cedar, spruce, mahogany, and oak; saws and sawdust; a steambox, mounts and wood formers; this is a sacred space, a craftsman's place, where the delicate balance between wood's weight and strength is played out in the structure and design of a shell.

#### THE CREW HOUSE

As a rowing club, use of the facility is contingent

upon membership, much like a health club and, in fact, there are a few features of the rowing club program that function in much the same capacity as a health club: there's a weight room, a sauna, whirlpools, and locker rooms. These uses are conceptually considered to be the "body" portion of the program. The *crew house* is a place of great physical effort and activity - weightlifting, aerobic conditioning (on ergometers, bicycles, and treadmills), and training in "the tanks".<sup>7</sup> Activities, here, strengthen, exhaust and rejuvenate the body as well as hone the techniques needed to master the subtleties and complexities of the oar stroke and the sliding seat. It is a wet, hard-surfaced, durable space, made of concrete, tile and metal. It's a space of machines. In here, voices echo off porcelain walls and mix with the clanking and banging of weight machines, as nearby ergs spin, whirl and whine.<sup>8</sup> It's a hot space, a moist space, a damp space, and in winter a steamy space that's warmed by radiant heat embedded in the floors and lower walls. Thick walls are topped by large amounts of glazing. Despite its earthen material palette, there is a tremendous amount of natural light. To allow for deeper light penetration, there are no interior partition walls; this is a long-span, load-bearing, sturdy-columned space, where massive, tile-clad

columns may be inhabited and contain a wide array of various programmatic elements: from bathrooms, whirl and plunge pools, to a sauna and steam room; from a janitor's closet, to water heaters, pumps, filtration and mechanical systems. In influence, the crew house is part John Irving, part Roman *thermae*.<sup>9</sup>

#### ADMINISTRATION OFFICES

Neither plush nor extravagant, the offices are instead functional, efficient, unassuming, and solid - a kind of spartan Yankee chic. Like the boathouse nearby, the offices' structural system is exposed. Wall studs and ceiling joists frame built in furniture - such as shelving, desks, and storage closets - made of clear cut maple, cedar, or mahogany. The use of materials is direct and restrained - with the use of such materials as interior-grade plywood for wall sheathing, exposed metal conduit for electrical service, or rough-textured concrete floors that prevent slipping. The offices are daylit, supplemented with task lights. There are no ceiling fixtures, no fluorescence, no artificial ambience. An exterior wall with glazing from floor to ceiling faces the river.

These are not the offices of corporate businessmen; these are the offices of former athletes,

rowers, people who have built their lives around a sport uniquely known for hard work, persistence, and determination, and who have been captured by the thrill of running water and the possibility of moving over it.<sup>10</sup>

#### USERS

The range of users is wide. Given the inherent difficulty in getting two, four, let alone eight schedules to correspond, it is assumed that the majority of scullers, those rowing single shells, will be older adults, at least beyond the age of collegiate. On this end of the user spectrum are lone individuals, established rowers, perhaps former collegiate scullers, pursuing a self-guided training regimen. They see the rowing club as a place to continue training a sport they enjoy, but may not compete in. It is also a social network, a chance to be around those who share a love for rowing. Typically older, these members maybe recognized leaders of the rowing club or may simply be viewed as stewards of the sport. The boathouse is a garage or storage shed for their shells and the crew house their health club.

On the other end of the user spectrum are those who, more often than not, are younger. Primarily high school students or collegians, these

rowers comprise the bulk of the clubs membership, its core. They are fully engaged in the various activities offered by the club, taking advantage of everything from training, to coaching, to racing. Because they are on similar academic and athletic schedules, they are the ones who fill the pairs, fours, and eights. The most familiar racing shell, especially in high school and college is the *eight*; that is, a shell of eight rowers each rowing one oar. These eights are the crews of Harvard and Yale, Oxford and Cambridge; the shells are immortalized in Boston's *Head of the Charles* and London's *Henley Regatta*. Filling the eights with younger club members has another benefit. It allows the club to leverage its coaching staff. One coach, working with two eights can oversee and instruct 16 people at a time. Two coaches, then, can aid 32 people. Add the summer student coach and as many as 48 rowers could be handled at once.

Other users are those few employed by the rowing club: the coaches and service staff. Two full-time coaches are on staff. They share the responsibilities of training both newcomer and veteran and run the day-to-day operations of the rowing club. Each coach will have an office. Although distinct, separate spaces, the two offices will be linked by a shared bathroom/shower. In

addition, over the summer when the club is especially busy, a temporary full-time coaching/administrative position may be filled by a varsity rower from the university. As a result, a smaller “student” office will be next to, yet separate from, the offices of the two permanent coaches. The club will have one full-time janitor and one boat repairman/facilities manager (again, this person is called a rigger), who makes sure all is in working order. The rigger will have a small office by the coaches as well as a “workshop/repair” space (again, this is referred to as a rigger’s bay or shell builder’s shop) in the boathouse.

#### ACTIVITIES

Beyond what I have already described in the preceding sections, there are a few other activities the club will support. As a regional hub, the rowing club may serve as sponsor or training center for the local university or an area high school. In this role, the rowing club may play host races of a local, regional, or even national scale. To accommodate the influx of users, the club will have slightly larger locker rooms and bathrooms than would be necessary to support only its local membership. In a utilitarian gesture, the boathouse will have two large garage doors, which allow vans and

trailers to be backed in when shells need to be loaded up and taken to races in different locations. As I mentioned earlier, space within the boathouse called a Rigger’s bay will be set aside for the maintenance, repair, and construction of oars and shells.

Some statistics on racing shells and oars. A typical racing single is 24 to 27-feet long and one foot wide. It weighs between 25 to 35 pounds and can cost as much as \$5,000. An eight is usually 60 feet long and weighs around 250 pounds. A racing eight can cost nearly \$15,000. Until the mid seventies nearly all shells were made out of wood. But now, like in so many other sports, the equipment or rowing has gone space age. It’s common now days for shells to be made out of fiberglass, and durable, lightweight composites such as carbon fiber and Kevlar. Though wooden shells are heavier and require more maintenance, they are still the standard at most Olympic and world class regattas. Oars (also called sculls), like shells, have been made typically out of wood. Today, however, they too can be found made from the same composites. Composite oars are even hollow, complete with replaceable blades. The specifications of racing oars are 12 feet, 6 pounds for a sweep and 9 feet, 4 pounds for sculls.

#### SIZE

The square footage estimates for the boathouse are flexible and contingent on further research into the size of comparable boathouses. The boathouse will need room for the storage of shells, generous and efficient circulation space that allows rowers to maneuver their 27-foot long boats in and out of a potentially crowded area. This area must also accommodate bench seating, storage for oars and rowers’ gear, parking for two club vehicles, a bathroom, and repair/workshop space. The accommodation of these things may result in a single, large communal space.

The training house is comprised of a “wet” side and a “dry” side. Program in the *wet* side consists of two training tanks for rowing instruction, a lap pool (with two lanes), three plunge pools (cold, warm, and hot), a whirlpool, a sauna, and a steam room. The *dry* side contains the exercise equipment, free weights, and stretching area.

The rowing club administrative program contains two coaches’ offices (with a shared bathroom/shower), a student’s office, the repairman’s office, two bathrooms, a janitor’s closet. Communal spaces are located nearby and consist of entry, the lounge that can open up onto an exterior patio, and two bathrooms.

**ROWING CLUB** *Square Foot Estimates*

THE BOATHOUSE

Storage for 25-35 shells	2,000 s.f.
Rigger's bay/builder's shop	1,250 s.f.
Circulation space	1,000 s.f.
Parking for two (2) vehicles	400 s.f.
Bench seating/storage	200 s.f.
Bathroom, one (1)	75 s.f.
Dock	t.b.d.
<b>BOATHOUSE TOTAL</b>	<b>4,925 s.f.</b>

ADMINISTRATION OFFICES

Common Spaces	
<i>Lounge</i>	1,500 s.f.
<i>Entry</i>	500 s.f.
<i>Bathrooms, two (2)</i>	each, 50 s.f.
<i>Patio</i>	tbd
Coaches' Quarters	
<i>offices, two (2)</i>	each, 150 s.f.
<i>bathroom &amp; shower, shared</i>	50 s.f.
Rigger's office	150 s.f.
Student's office	100 s.f.
Bathrooms, two (2)	each, 25 s.f.
Janitor's closet	25 s.f.
<b>ADMINISTRATION TOTAL</b>	<b>2,775 s.f.</b>

THE CREW HOUSE

Part I, "Dry Side"

Exercise equipment	
<i>free weights, ergometers, bicycles</i>	2,000 s.f.
Locker rooms	
<i>mens, incl. bathrooms</i>	1,000 s.f.
<i>women's, incl. bathrooms</i>	1,200 s.f.
Janitor's closet	25 s.f.
<b>"DRY SIDE" TOTAL</b>	<b>4,225 s.f.</b>

Part II, "Wet Side"

Training tanks, two (2)	each, 600 s.f.
Lap pool, two lanes	200 s.f.
Plunge pools, three (3)	each, 100 s.f.
<i>cold, warm, and hot</i>	
Whirlpool	150 s.f.
Steam room	150 s.f.
Sauna	100 s.f.
Equipment storage	100 s.f.
<i>pool equipment &amp; cleaning supplies,</i>	
<i>training oars</i>	
Unisex bathrooms, two (2)	each, 100 s.f.
<b>"WET SIDE" TOTAL</b>	<b>2,400 s.f.</b>

**ROWING CLUB TOTAL 14,325 s.f.**

FURNITURE, FIXTURES AND EQUIPMENT

- Motors (2) for moving water in the training tanks
- Water pumps and heaters for each pool
- Sauna stove
- Steam room equipment
- Exercise machines
- Free weights
- Boat repair tools
- Office furniture
- Patio furniture
- Industrial light fixtures for training house

ADJACENCIES

The programmatic elements in the rowing club are rather simple and distinct: boathouse, administration offices, and crew house. The administration offices will serve as swing space between crew house and boathouse. Its central position places the coaches and rigger in the programmatic role of oarlocks, or, if you will, thole pins. They are the location around which the rest of the structure rotates, or to which the other program is anchored.

HIERARCHIES

Hierarchy is not a word that sits easily in this pro-

gram. A far better choice is balance, both dynamic and continuous. In a shell, even the slightest action on one side of the boat's center line must be countered by an equal, opposite and immediate reaction on the other side or the boat will roll. Such is the delicate and slippery nature of remaining upright in the scull. I am not proposing that program be treated with exactly the same unyielding attention to all things being equal and countered. However, in the rowing club, program is arranged in the *spirit* of continuance and balance, where no one space is preferred over another. Again, this desire is also a reflection of the vital union in rowing of mind and body, technology and artistry, brute and grace.

In the difficult task of attempting to describe the individual elements, that when seamlessly united, comprise the sculling stroke, Richard Burnell notes:

*Sculling is not a series of positions or movements, but a live and fluid cycle. In training, the sculler must direct his attention to a succession of details, but never forgetting that it is the continuous cycle which matters.*"<sup>1</sup>

Program and design must reflect this unique reality of fluidity and mercury.

#### THE SITE

The site in this program is specific - on the west bank of the Mississippi River, above Lake Street Bridge [figs. 89 thru 91]. There are several reasons for choosing this location. Because barge traffic on the Mississippi halts at the Falls, the number of boats above the Falls is markedly less. Use of the river is limited primarily to smaller, personal watercraft. The result is a situation that's less congested and by extension far safer. In addition, river currents above the Falls are slower and the surface of the river is typically more placid, not subject to the churn generated by St. Anthony Falls, the locks, and heavy boat traffic. A final consideration is the shape of the river. Above the Falls, the bends in the Mississippi flatten and stretch, giving way to longer straights and gentler curves, all of which is ideal for rowing.

Another point that brings this project into the realm of real-world considerations, the city of Minneapolis has recently formulated and finalized development plans for miles of additional Mississippi river front north of St. Anthony Falls. Over the next 20 years, the city plans on moving present day industries (such as a concrete crushing station, manufacturing plants, and tool and die companies) off the river. In their stead will be res-

idential, commercial, and, most importantly, acres of new parks and parkways, which would extend the current Mississippi River Park northward, miles beyond its current terminus, Mill Ruins Park.<sup>12</sup> Incorporating a rowing club into the overall river front development mix would be an exciting possibility.

Earlier, when I covered program and user groups, I mentioned that the rowing club could serve as a regional rowing hub, hosting regattas of a local, regional, or even national scale. The tremendous outdoor space needed to host such an event (this would be a perfect Aquatennial feature) could easily be found in the parks adjoining the river front, adjacent to the rowing club.

#### Notes

1. *In an effort to make some of these terms clearer I have excerpted the following passage from Barry Strauss's book, Rowing Against the Current. It' is very helpful in highlighting the differences between the technical terms used in rowing.*

"Rowing refers to a sport whose practitioners race in light, narrow boats propelled by oars. The practitioners are know as rowers, oarsmen, or oarswomen; the boats are know as shells. Each rower

sits midway between the sides of the boat and, in what is known as sweep rowing, each rower works one long oar. In sweep rowing, a racing shell comprising two rowers, each working one oar, is called a pair; one with four rowers, each working one oar, is called a four.

Give a rower a pair of two short oars, rather than one long one, and it becomes possible for one person to row a shell by himself. Such a short oar is called a scull; two such oars are called a pair of sculls. A shell worked by sculls is called a sculling boat or a scull; the rower working it, a sculler; he rows or sculls the boat. A shell worked by one sculler is called a single or a single scull; one worked by two scullers (for a total of four oars) is called a double or double scull; one worked by four scullers (a total of eight oars) is called a quad.”

Rowing Against the Current, *Strauss, Barry*, ppg. 17-19.

2. In this brief article, *Cathy Kemper*, a 56 year-old Masters sculler living in San Diego, talks about the unique and solitary nature of sculling. The quote is taken from an interview with, *Voice*, a quarterly magazine publication of Carleton College, Northfield, MN.

Vol. 67, No. 2, Winter, 2002, ppg. 38-39.

3. *A straightforward, honest, and self-reflective look at the challenges presented by a later-in-life introduction to the sport of rowing. A professor of classics and history at Cornell University, Barry Strauss offers a poetic tribute to the power of rowing and its ability to elevate the most basic and elemental struggles of mind and body. An excellent insight into the culture of rowing, its history, its allure, and the sport's unique blend of discipline, rigor, and romanticism. Rowing Against the Current. On learning to scull at forty, Strauss, Barry. Simon and Schuster, New York, 1999.*

4. *Rowing history and Greek myth would be a rewarding addition to this thesis, but its scale and scope fall outside of what can be reasonably included. Suffice to say, that as an english literature major myself, and having read many of the classics as well, the energy and imagery of Greek and Roman myth will be a strong undercurrent in this project. If even only for inspiration.*

5. *One prominent feature of a generative drawing, and a means to keeping discovery open, is its ability to be simultaneously read from multiple perspectives, such as in plan and elevation. Not only can the drawings be read from both points of view after their completion, but while being drawn they are also being considered from both points of view. This adds an increasingly difficult and rich layer to the*

*drawing effort - to think of and construct a drawing while its being drawn in multiple dimensions.*

*As has been stated, following each drawing, and even while drawing, an attempt is made to interpret and to capture a drawing's potential power to inform and propel the design process. How to display and record the ideas discovered during interpretation is another critical endeavor and one that must be clearly understood. One methodology used to organize and present ideas in this thesis is hybrid or composite drawings [fig.87].*

*For centuries, drawing has played a vital and prominent role in the discipline of architecture. Anyone who has seen Michelangelo's sketches and drawings for St. Peter's Cathedral in Rome or the Laurentian library in Florence; anyone who is familiar with the dense and particular nature of Scarpa's studies; anyone who has examined the details in Peter Zumthor's drawing sets understands the complexity, the variety and the range evident in architectural representation. I believe the discipline of architecture has been undergoing a dramatic and powerful shift in how it views the role of representation. There exists within our profession a unique and exciting opportunity to explore a new way of organizing information, of making drawings, and of communicating ideas. No longer are the clean, precise, black and white drawings of 20th century modernism the standard of architectural representation. Those drawings, which so clearly reflect the period's strong ties to notions of*

logic, technology, universality, purity, even hygiene, have given way to another type of image. The “hybrid” or “composite” drawing.

By “hybrid” or “composite” drawings I am referring to a way of presenting architectural information that is fluid and limitless. The fusion and superimposition of a variety of ideas, techniques and media brings into proximity information that has previously existed independently in separate drawings. The intent and potential of composite drawings is for multiple images to be brought together in such a way they not only read as one drawing, but also provide a fuller, more complete illustration of the completed design project. The resultant sum of images is potentially far richer than each single image in isolation. To communicate various viewpoints within one drawing challenges the

tradition of attempting to record the totality of a building with singular, isolated renderings.

What excites me about hybrid drawings is their potential not only to meld many images into one drawing, but also to bring two very different worlds - the intangible and the tangible - closer together. Beyond even this pragmatic possibility lies the potential for composite drawings to explore things that cannot be built, things that are becoming, which places the role of presentation drawings back at the forefront of seeking the intangible.

In the superimposition of multiple images and ideas or in the combination of various media and techniques, composite drawings have the potential to become forceful, generative fields of complex relationships. By drawing from a variety of loosely, even disparately, related parent sources,

architectural design drawings can be “cross-pollinated” with an infinite range of material. The resulting drawings may possess a power to transform architectural ideas far beyond that of their component parts, while the representational process itself could redefine how architecture is practiced and what is designed.

The hybrid drawing has had a profound impact on how architects view the role of presentation drawings. In his book, *Hybrid Drawing, Techniques* by Contemporary Architects and Designers, M. Saleh Uddin states that, “the nature of hybrid drawings has changed our perception and expectations about the role of architectural drawing. Although a hybrid drawing communicates on many levels beyond utility, it is also perceived as an artwork, a prized artifact.” This is a crucial point.



[fig. 87] *Building Study of Peter Zumthor's Vals Baths, Vals, Switzerland, hybrid/composite computer layout, 17"x4"*

This hybrid image is a prime example of multi-layered imagery integrated to communicate a rich multi-purposed meaning. This computer generated image is compiled of photos, drawings and computer imagery. The combination of various images from drawings to finished CAD details attempts to communicate both the precise and poetic nature of Zumthor's work.

*And, much like the drawings of the early modernists revealed the issues governing architecture at the time, I believe composite drawings are the sign of a new contemporary agenda within the discipline of architecture, one that may be more concerned with the construction of images than the construction of buildings.*

*Another point of curiosity is the power of the new artifact. It's reach can extend beyond utility and into the realm of art and often has a life beyond the completion of the built project. This is an issue unique to architecture and one that needs more attention. Are we simply skilled image-makers, or are we designers of buildings? Where does architecture happen? Is it in the drawing of the building or in the building of the building?*

*Although combining a large number of diverse drawings into one can result in ambiguity, or worse yet, full-blown confusion, hybrid drawings offer the opportunity to explore and experiment with a methodology that has the potential to alter how architecture is made and presented. Many architects are now conceiving of and generating drawings that present more than what is known; they are multi-layered, richly textured, dense, at times atmospheric, compositions that have strong roots in the history of graphic arts as well as the multivalent tradition of Cubism and Constructivism. An interesting consequence of this shift in the role of architectural representation is that, in many cases, the lines between representational techniques in archi-*

*itecture and graphic design have become so blurred that, at times, a distinction between the professions seems hardly to exist. This condition is at once both exciting and concerning. It asks the question, What is the province of architecture?, and, How are we distinct or separate from other disciplines?*

*Is this process engaged simply in a technical slight of hand and not the exploration of substance and validity. An even larger issue is what does this trend reveal about the issues dominating architecture today? The potential now exists for an architectural drawing to be both a modernist demonstration and a post-modernist interpretation.*

6. *The best example of this condition is Peter Zumthor's memorial and museum building, Topography of Terror, in Berlin, Germany.*

7. *The "tanks" are "long, water-filled trenches down each of which runs a concrete spine with eight seats. The water channel on either side of the row of seats is wide enough for a sweep oar to fit comfortably." Rowing Against the Current, p. 51. A motor at the front of the tanks can be turned on to simulate the current in the river. The tanks are a place to learn the techniques and rhythms of the stroke and the motion of the slide seat before heading out on the water.*

*At the highest levels, rowing projects a grace and fluid-*

*ity that masques the extreme effort needed to compete and succeed. But in sharp contrast to this graceful public exhibition is a private brutality. Historically, east coast prep school and collegiate crew rooms have been demonstrations of shoe-string, bare-bones spartanism. Rower D.C. Churbuck describes his first experience in "the tanks" at an all boys school in New England. I could have pulled a similar quote from any number of sources, from any number of boyhood recounts. His reluctance to try the tank is obvious and understandable:*

The seniors asked me if I would at least think about rowing - give it a try - even take a few seconds to come inside and try the tank, a homemade swimming pool filled with very dirty water and fitted with two oars and sets of rolling seats mounted on the side. The two oars were modified with open blades so they would move through the stationary water without too much resistance, simulating on a prep school budget the sensation of rowing. Finally, when the heat and the stench of the once-stagnant, but now roiled water was turning my stomach, I agreed to give it a try. I stepped out of the dark recesses of the basement and avoided meeting the gaze of the two coaches. To the day, I can remember that fist stroke.

The Book of Rowing, chapter 1, "The Start", Churbuck, David C., p. 3.

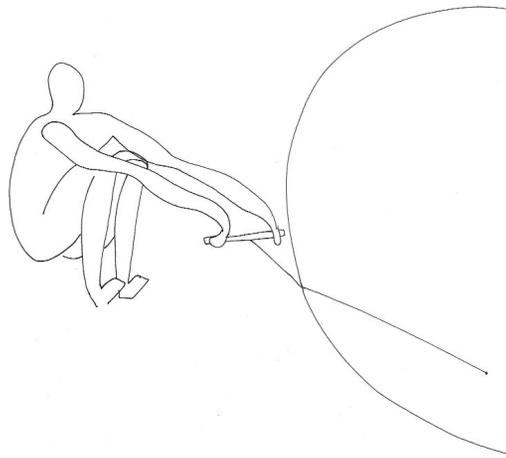
*The miasma. The primordial soup. Fun. I half expect Nellie to rise from the bottom of the tank and snap off half of his oar. But such austere conditions seem to be common for rowers. Barry Strauss, a Cornell professor in his early forties, describes his first encounter with “the tanks”:*

The name suggested a prison or bunker and the decor - tile and concrete, weights and machines, windows too overgrown with ivy to let in much natural light, a smell not of varnish [like in the boat house he describes earlier] but of disinfectant - added to that impression. Yet the space was the college crew room in a campus gymnasium. No guns or watchtowers, but the place was Spartan in spirit, a warning that rowing is about more than picturesque traditions.

Rowing Against the Current, *Strauss, Barry, p. 51.*

8. “Erg” is rowing slang and is short for ergometer (which is Greek for “work meter”). The ergometer is an exercise machine developed in the 1970s by former rowers looking for a way to keep in shape over the cold winter months. Made of metal and wood, the erg is a simple machine. With a sliding seat and a large fly-wheel [fig. 88], it has been designed specifically to mimic the act and feel of rowing. A small computer monitors your workout, displaying the revolutions of the wheel, distance travelled, and energy expended. A workout on the ergometer is boring, brutal

and immensely beneficial (and to add one more “b” to the list, the conclusion of the workout is often followed by barfing. Seriously.) I’ve been told by a friend it’s a tremendous way to maintain and strengthen rowing technique, muscle and aerobic fitness. Great. I’ll take her word for it.



[fig. 88] “Erg” Study, pencil on paper, 14”x11”

9. Admittedly, the John Irving reference is obtuse; the *thermae* connection is more evident and direct.

For all their love of bathing, Grecian structures never achieved the monumental dimensions of the Roman baths. Next to aqueducts, public baths (*thermae*), were some of the grandest civic architectural statements undertaken by Roman civilization. As evidence of their elevated standing in Roman social culture, *thermae* were typically the first

buildings constructed by Romans when establishing a new town or when conquerors of an existing city. Thousands of baths were built all over the empire. The advanced construction techniques needed to build the Parthenon are routinely attributed to the lessons learned during centuries of building baths.

Roman *thermae*, whose grand spaces were typically supported by barrel vaults and covered by domes, have a unique and very particular architecture. Public baths in the Roman world generally consisted of five main parts. These include the apodyterium, the palaestra, the caldarium, the tepidarium, and the frigidarium. The apodyterium was a changing room where the ancient bather could leave his or her shoes, clothing, and personal belongings. Some of these “changing rooms” contained niches for people to place their personal effects while other were much more simple. The palaestra of a Roman bath was a centrally located outdoor exercise yard, surrounded by a colonnade. Rather than a location for serious exercise, as in the Greek world, this area was typically a place for bathers to relax, socialize, and show off. The notions behind the layout and design of the central exercise area in the training house is a loose reference to the role of the palaestra in antiquity: it is a communal place of physical camaraderie. The tepidarium, caldarium, and frigidarium, contained warm, hot and cold water, respectively. These baths are the direct inspiration behind the plunge pools in the training house program.

Now, about John Irving. The novelist is neither a rower, nor is rowing the focus of his novels. But the attitude and tenor of his work is finding a place in my vision of the rowing club. First, the most obvious association: many of Irving's novels - *The World According to Garp*, *Hotel New Hampshire*, *Cider House Rules*, *A Prayer for Owen Meany*, *The 158 Pound Marriage* - are set in New England, which, coincidentally, happens to be the birthplace of American rowing. Okay, so why not think of Stephen King instead? Because there is another, less apparent, connection. John Irving is an enormous fan of wrestling. Wrestling? Yes, and the more I have read about the history and nature of rowing, the more I have found myself having parallel thoughts about John Irving's musings on the sport of wrestling. Irving has wrestled most of his life and continues even to this day. The sport, and the spirit of its competitors, often makes its way into his novels. In *The World According to Garp*, the main character, Garp, is a wrestler. The sport helps drive the plot and define the protagonist, serving as both foil and foundation for plot development. Within the novel are several descriptions about the nature of wrestling. Irving writes of wrestling's solitary nature and the extreme physical demands it places on its participants: the grueling, early morning practices, the intense competition at meets, the discipline and fortitude required to overcome mental and physical limits. Even his descriptions of the prep school

wrestling room Garp labors in could stand-in for the dour descriptions I've read about various crew rooms. Making the link even more powerful is that there seems to be something of the Yankee spirit in both sports: hard-scrabble determination, independence, and solitary hard work.

For Garp, wrestling serves as a retreat from the demands of the world as well as his connection to it. It acts as the primary filter through which he interprets the events of his own life. In *Garp*, Irving just as easily could have been describing crewing as wrestling: Garp might just as well have been a rower.

Or a Greek athlete.

10. This sentiment is not original to me. It is taken from Santayana's *Lost Pilgrim*, where the full quote reads:

What is there in the universe more fascinating than running water and the possibility of moving over it? What better image of existence and possible triumph?

How I wish I had written those words.

11. Richard Burnell is a rower - an Olympian in 1948 - but above all he is an Englishman. In reserved and eloquent prose, he breaks down the sport of rowing, its etiquette, its equipment, its geometry, physics, and mechanics. *The Complete Sculler* is a small book, a bible, of sorts and, for me, has proven to be a clear and indispensi-

ble guide into the subtleties and complexities of the sport. The quote is taken from the section in the book on technique, whose focus is on the movements and positions of sculling.

In addition to making use of the text, many of the graphics in my presentation drawings that diagram the movements of sculling were created based on those found in this book. *The Complete Sculler*, Burnell, Richard. Sport Books Publisher, Toronto, 1989, p. 48.

12. "The stretch of river above the Falls of St. Anthony offers the last unrealized waterfront amenity in the City of Minneapolis." So reads the first line of the City of Minneapolis's *Implementation Plan for the development of the west bank of the Mississippi River: The Upper River Master Plan*, as it is called, is one component of the city's *Comprehensive Land Use Plan* and it outlines in great detail how proposed long-term transformations of land use, re-zoning, and river front development would alter and benefit the area. An important idea to be aware of, the plans states, "re-zoning lands will halt future expansion of industry on the riverbank, while creating a climate of confidence necessary for private developers to invest in new housing construction, and other planned uses." I propose that the rowing club be apart of the "other planned uses". I cannot think of a better setting for an urban rowing club.

SITE + CONTEXT *Context Plan, Site Section & Site Elevation*



[fig. 89] *Context Plan*, underlay, oil bar and colored pencil on paper; overlay, scanned site plan, 36"x28"

*“By making a drawing we gain access to the world of ideas and establish a position from which a point of view may emerge. But all of the latent potential in drawing is contingent upon first making a mark. For drawing is neither a passive nor a mechanical process and judgements are continuously being made as to the quality, density, variety or paucity of marks made on the page. It is a conversation that seeks to balance multiple considerations and multiple possibilities. There seems to be a certain correlation between a successful drawing’s richness and the number of senses employed, both in the making and the subsequent viewing.”*

PART I: THE INQUIRY  
“The Intangible Nature of Tangible Things”



[fig. 90] *Site Section at Lake Street Bridge*, oil bar and colored pencil on drawing paper, 24”x16”

*There is something about being on the water, below the sky and above the earth. Rowing seems much to be about place - this drawing attempts to articulate that place.*

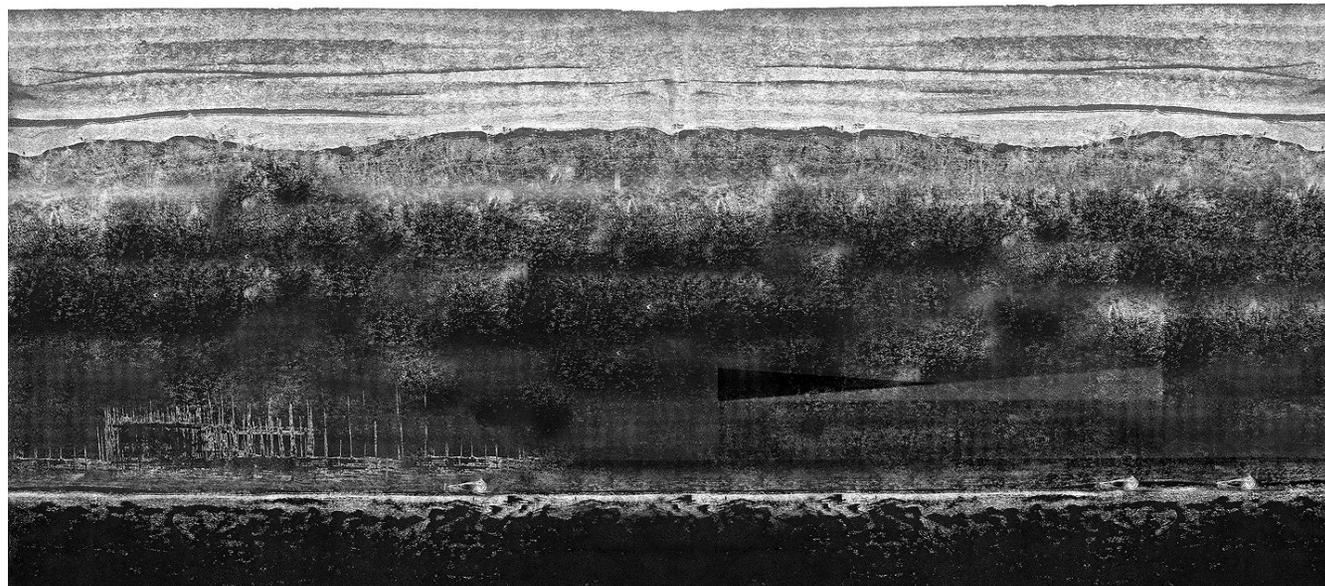
At the foundation of this thesis is the question, 'Where do ideas come from?' This thesis claims that architectural ideas can be generated through the unique act of making drawings. It is not the subject of the drawing inquiry that is of importance; rather, it is the *effort* of drawing that is of primary importance. By *making* drawings one may find, capture, even manipulate the intangible nature of tangible things.

Essentially, this thesis is a drawing inquiry, a deeply reflective and generative probe into the essence of Things and ideas. Ideas generated through these drawings reveal not only the intangible natures' of these things, but more importantly, inform ideas about program, building, and architecture. The design of the boatbuilding workshop is based on the ideas found through the process of drawing.

Ideally, the ideas are not directly linked to the artifact. The drawings are to be *interpreted*. Through interpretation, the drawings are uncoupled from the limits of appearance, released from what is known, and begin to function as surrogates for larger ideas. The drawings make room for architectural possibilities.

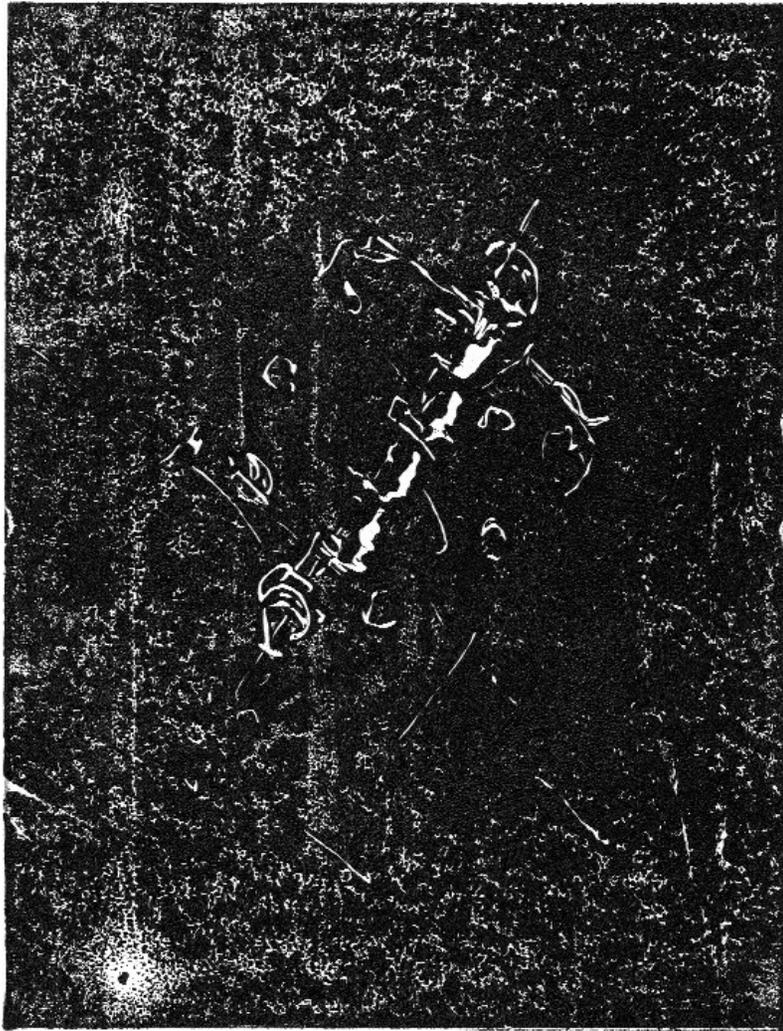
River Road Elevation

Mississippi River Elevation



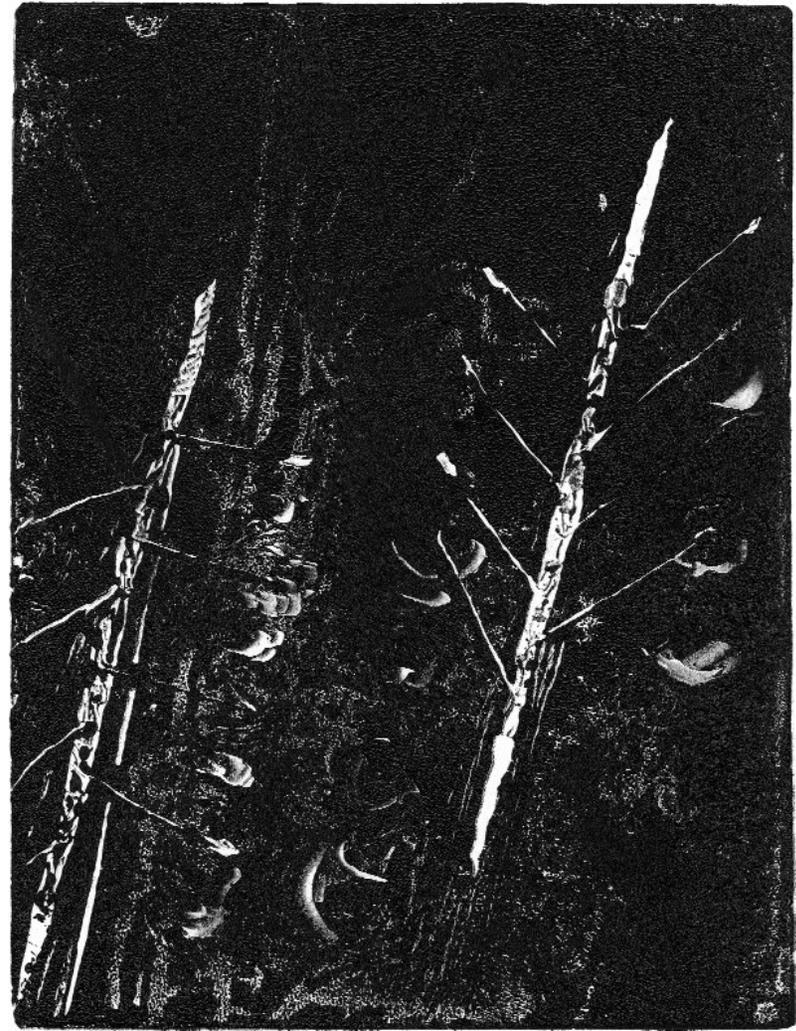
[fig. 91] *Site Elevation*, printmaking ink on printmaking paper, 17"x14"

*A view of the site from the Mississippi River. The secluded site is dramatically below West River Road, accessed by a narrow switch back dirt road.*

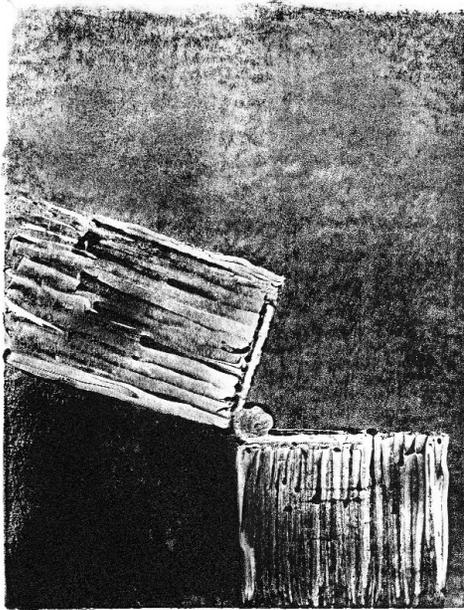


[fig. 92] *Outlines*, printmaking ink on printmaking paper, 14"x11"

*This section places images from different drawing threads side by side. Fig. 92 was one of the first images to cross over from a drawing of an artifact - the hinge - to an image about water, suspension & floating. Here the hinge drawing serves as a direct antecedent to the Regatta print [fig. 93].*



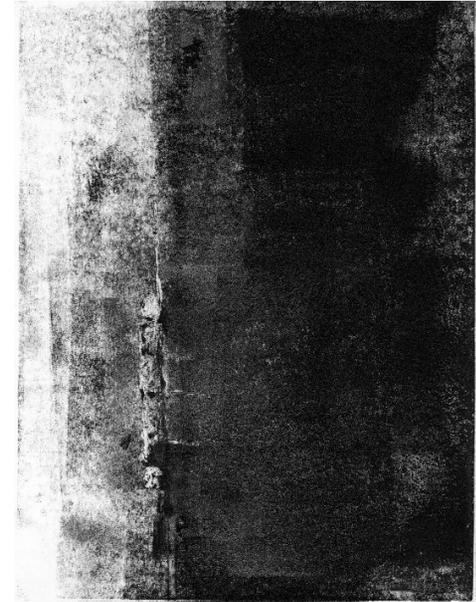
[fig. 93] *Regatta*, printmaking ink on printmaking paper, 14"x11"



[fig. 94] *Hinge Study*, printmaking ink on printmaking paper, 9"x12"

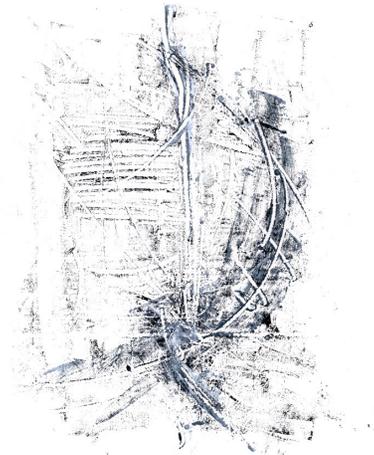


[fig. 95] *Hinge Study*, oil bar and charcoal pencil on paper, 18"x24"



[fig. 96] *Hinge Study*, printmaking ink on printmaking paper, 9"x12"

*These three hinge study images are the best representatives of dozens of drawings in their ability to suggest ideas beyond the hinge artifact. The ideas of inside and outside [fig. 94] of motion and flow [fig. 95] and edge and threshold [fig. 96] are as much about boathouse and architecture as they are about qualities of a door hinge. The notion of light and ephemeral versus heavy and anchored can be found in fig. 96 and is the impetus for fig. 97 on page 100. It serves as the guiding design logic for a large portion of the boathouse, where there is a thick solid wall serving as a counterpoint to a curvilinear delicate frame.*



[fig. 97]



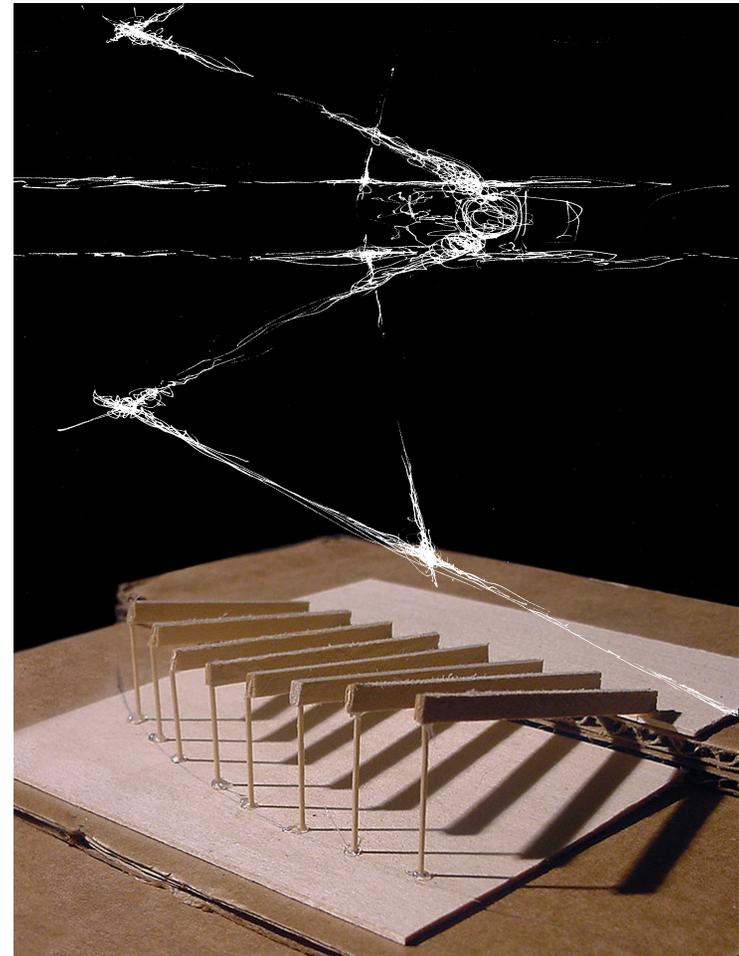
[fig. 98]



[fig. 99]



[fig. 100]

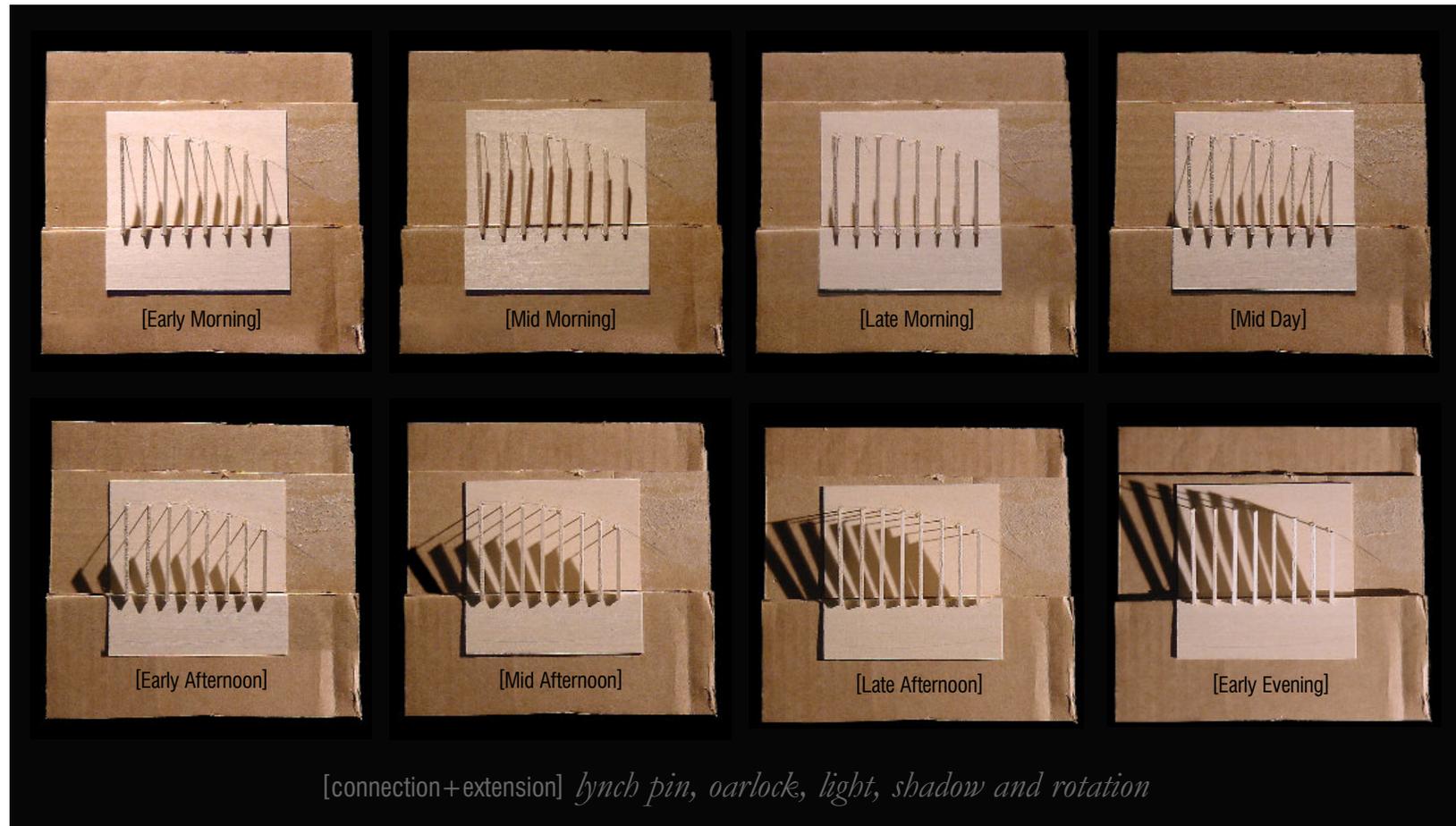


[fig. 101]

[figs. 97 thru 100] *Rotation Prints*, Nos. 2, 3, 4, 5 out of 10, printmaking ink on paper, 17"x14"; [fig. 101] *Conceptual Model*, cardboard and basswood, not to scale  
*The Rotation Prints [figs. 97 thru 100] set up a second logic within the boathouse design, that of fulcrum and rotation. These prints are perfect compliments to the series of rowing study drawings found in PART III [figs. 58 thru 66] and laid on top of the study model in figs. 101 and 102. The ideas of levers has been unlinked from hinge and rowing to architectural notions of light and shadow. The series of study models that follow are a test of the play and movement of shadows throughout the day.*

*The unique act of making drawings, even drawings not directly about building, can lead to ideas about architecture.*

PART I: THE INQUIRY  
“The Intangible Nature of Tangible Things”



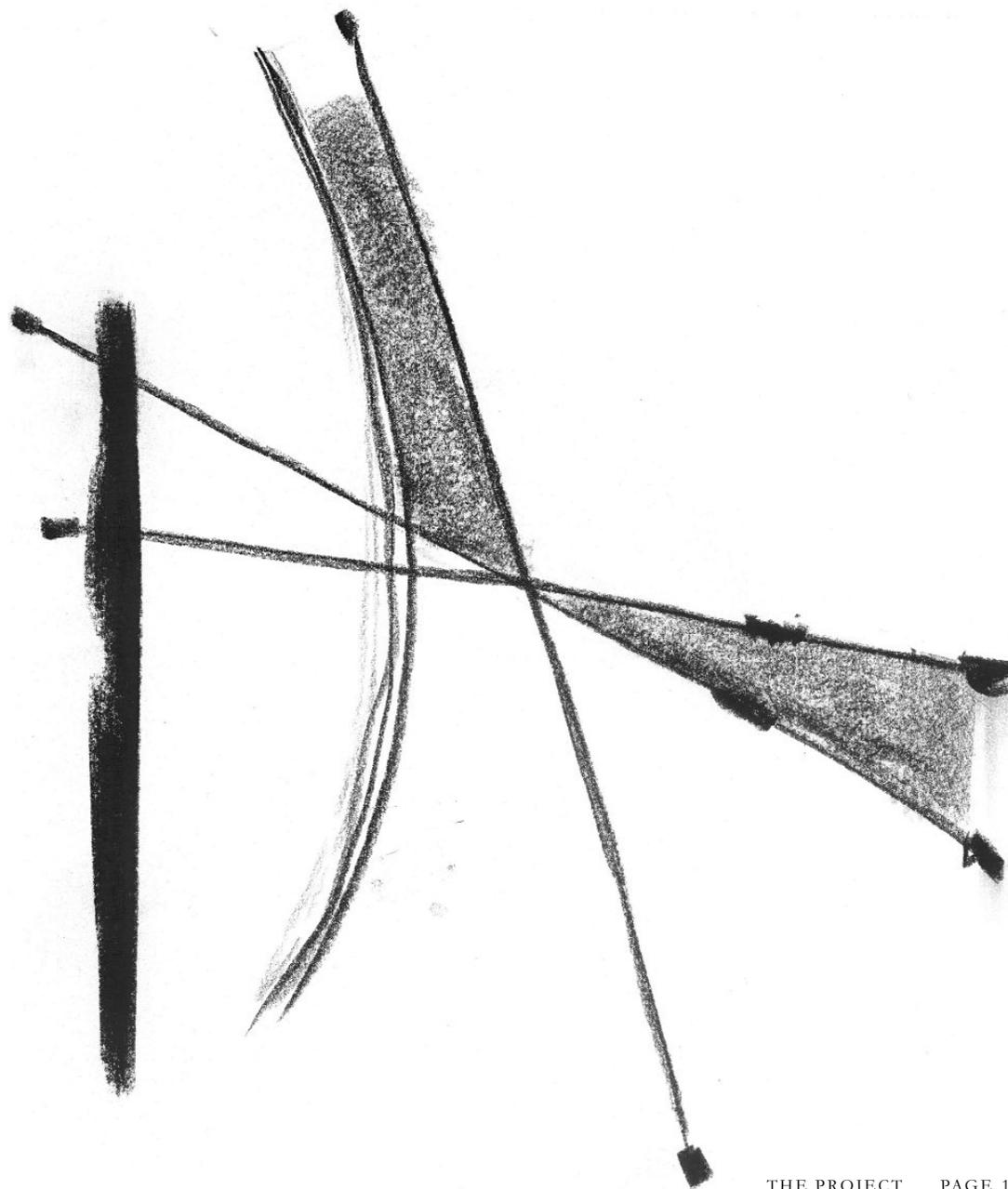
[fig. 102] *Light and Shadow Study Models*, cardboard and basswood, not to scale

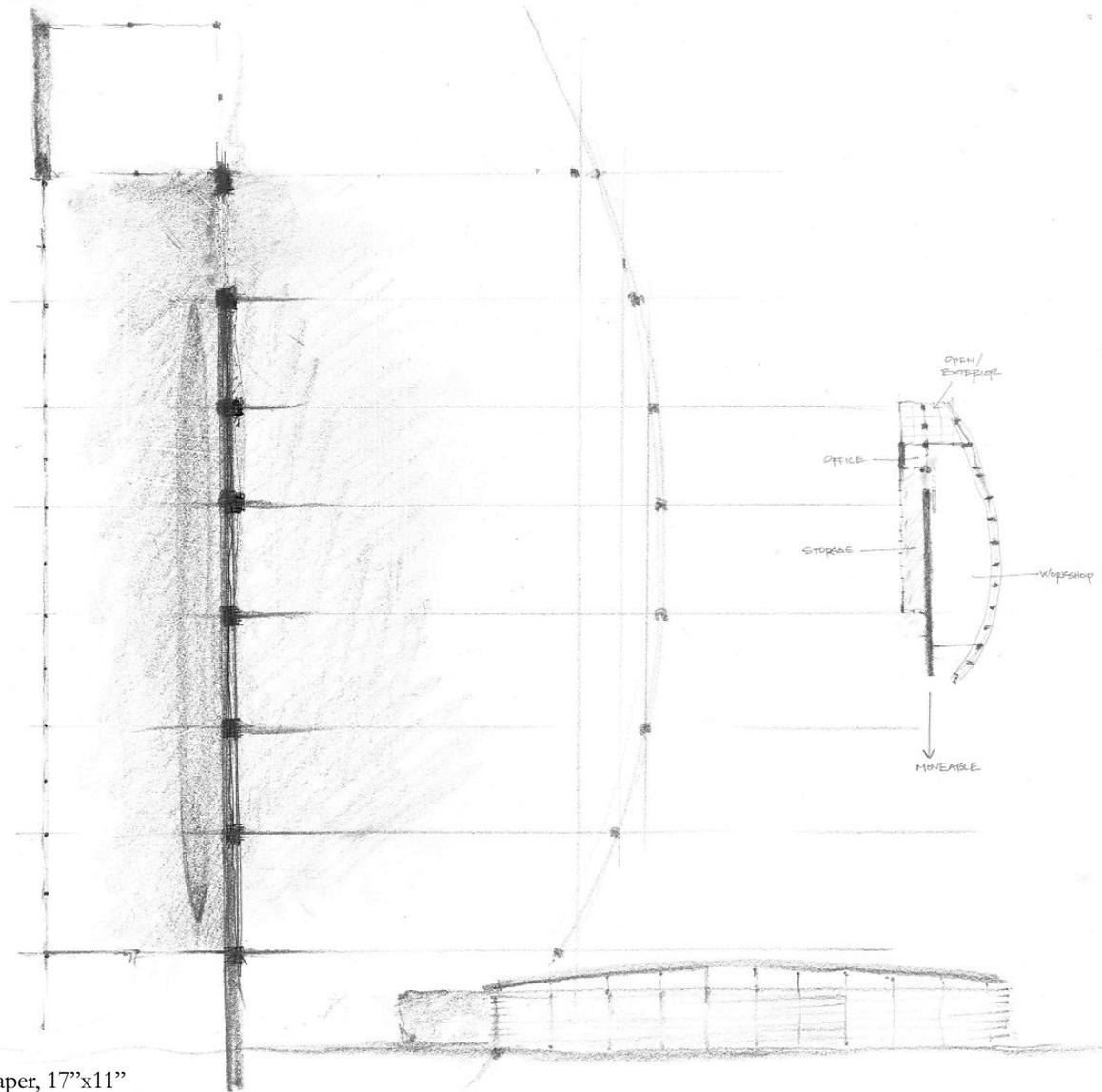
*Conceptually, the building functions much like a lynch pin, or more appropriately, an oarlock, around which the sun rotates, casting shadows that move like oars through water.*

[fig. 103] *Workshop Study*, charcoal on paper,  
11"x17"

*This drawing, shown earlier on page 31, is one of the best representations of a transitional drawing, one that has an obvious link to both the rowing study as well as architectural possibility. It is a lynch-pin effort that effectively inhabits two worlds, possibility and reality.*

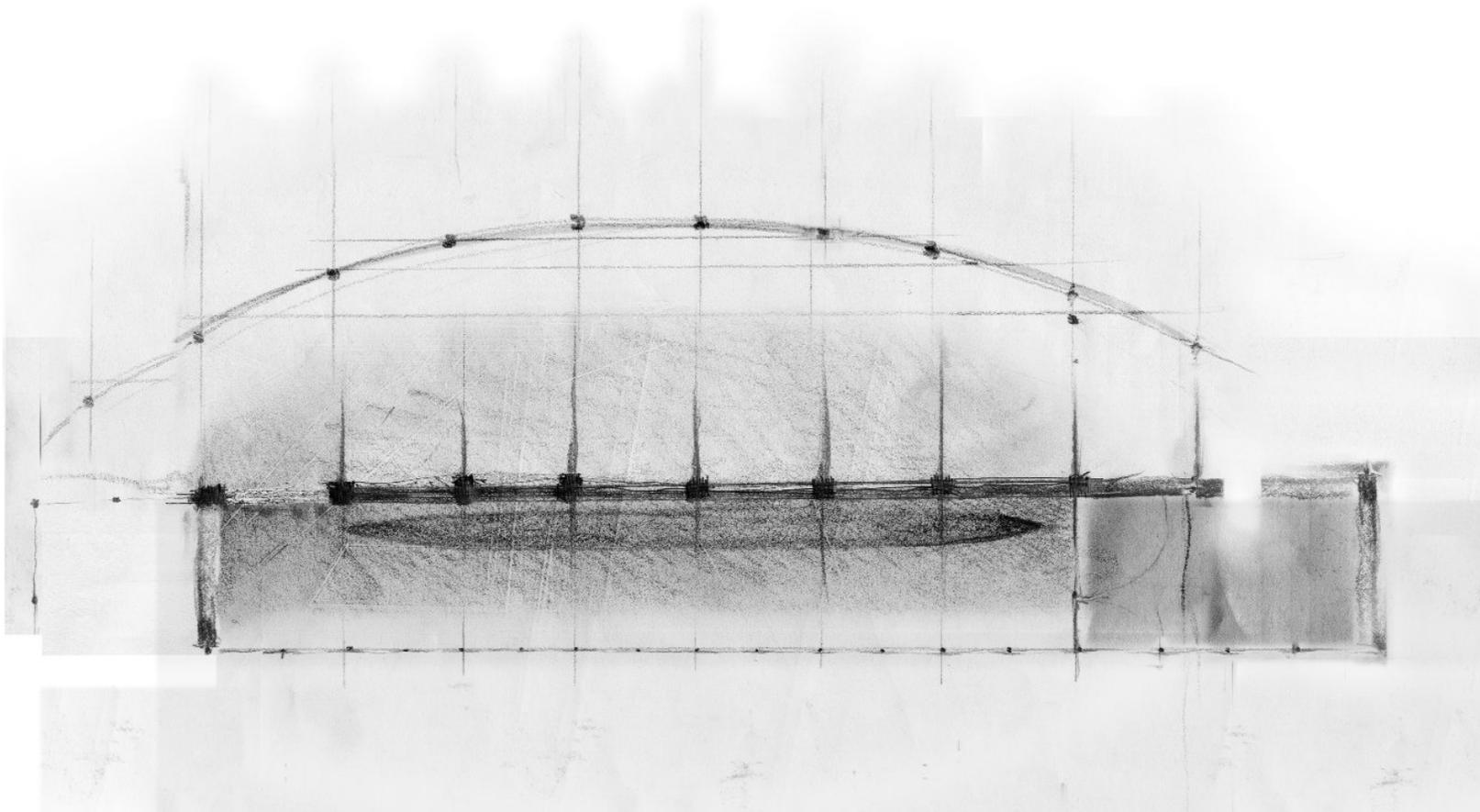
*It is also a record of having made a decision. Out of the various possibilities evident in a transitional drawing, a direction and choice must be made. The result is a more focused drawing effort, one that features a singular idea or logic. The drawings that follow this study do not continue in a linear fashion toward a design solution; ideally, they continue to oscillate back and forth, between open and generative drawings and more fixed studies of ever increasing clarity.*





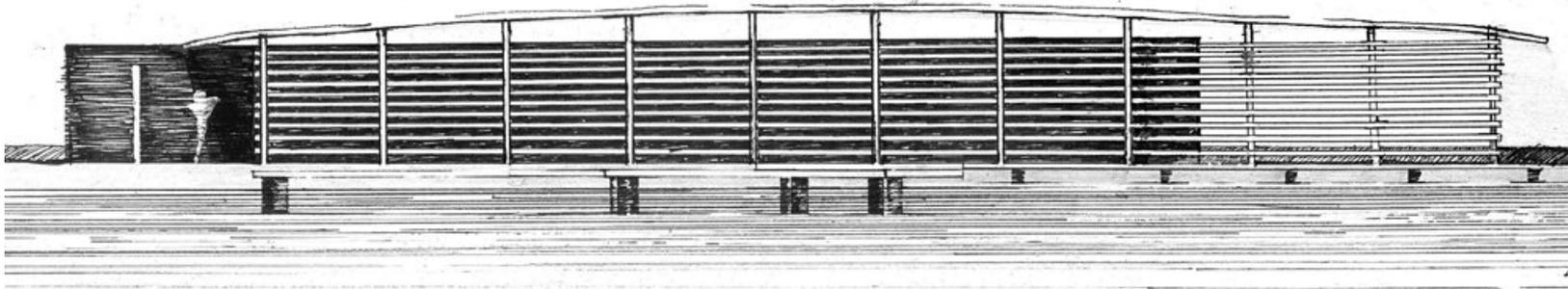
[fig. 104] *Boathouse Study*, pencil on paper, 17"x11"

*This boathouse image can clearly be seen as referring back to the ideas posed in earlier hinge studies [fig. 96]. A heavy wall to which various elements are attached anchors the design logic.*



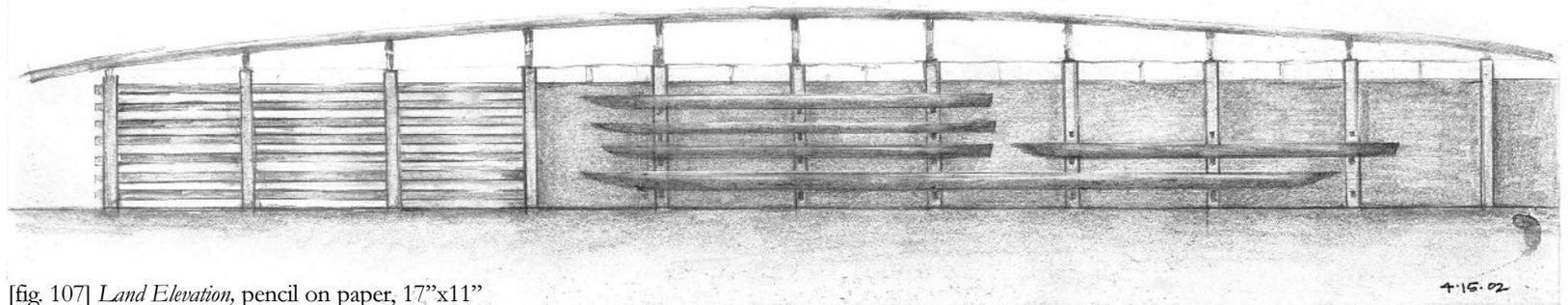
[fig. 105] *Rigger's Bay Detail*, pencil on paper, 17"x11"

*What is the nature of the thick line in plan? This line has served as the anchor, or more correctly, the spine upon which the design is ordered. Various connections and attachments act as "spurs" radiating out and away from the wall. So what is nature of this wall? Is it simply a divider of space or is it inhabitable? Figure 105 becomes another more detailed study of a particular element found with the more generative drawings. The heavy wall, much like the barrel of a metal hinge, is the spine around which the boathouse is ordered. On one side of the wall skulls are stored; on the other side, a delicate and translucent structure is attached. Conceptually, the boathouse workshop plan can be read much like a flattened hinge.*



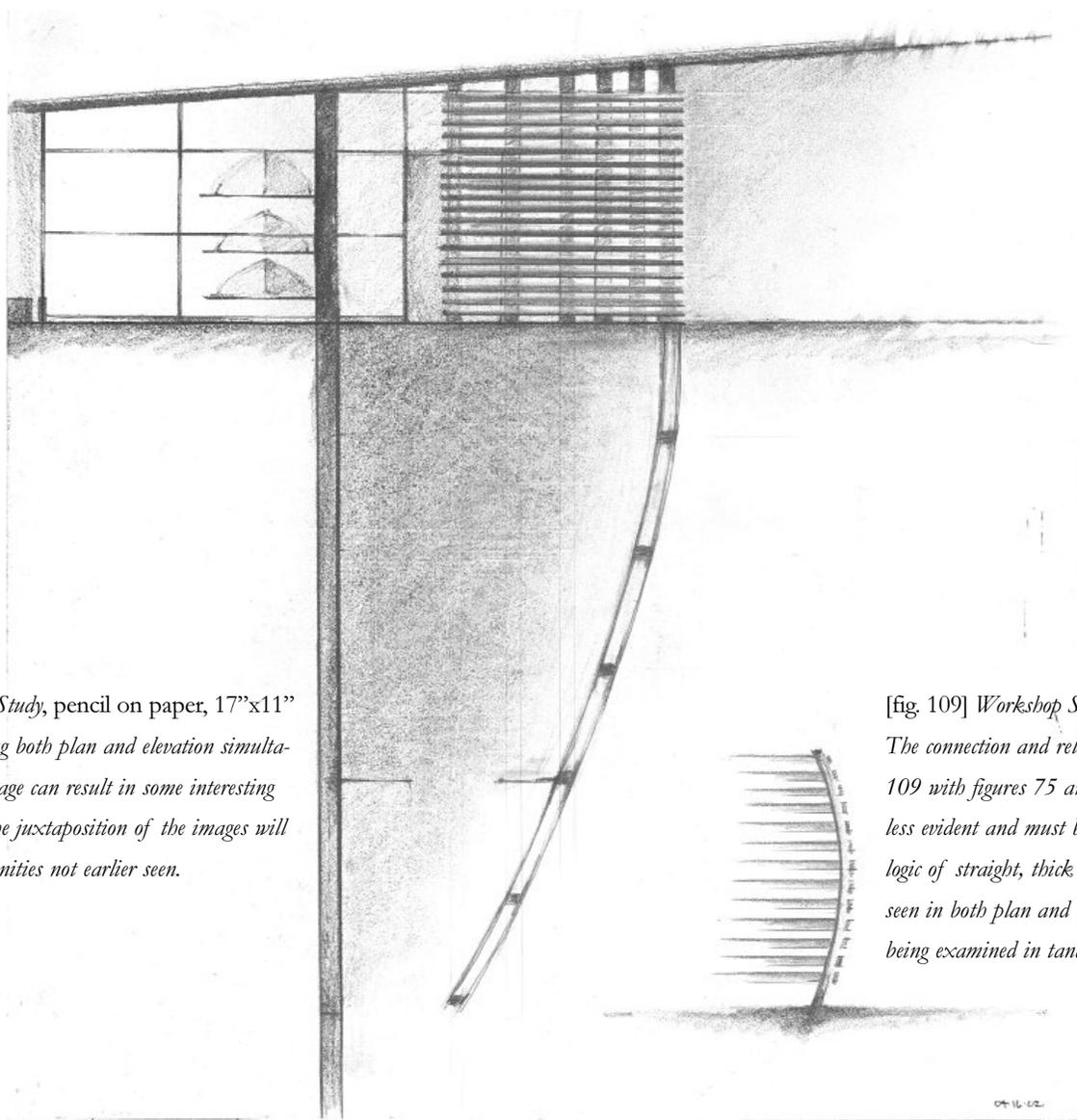
[fig. 106] *River Elevation*, material description, 17"x11"

*This is perhaps the best graphic representation of the rhythm studies. The opacity and density is a counterpoint to the thin and translucent wood slats. An attempt is made to create visual depth, as well, by the accumulation of vertical layers, walls of different material characteristics, sliding along side one another, like a scull over the water.*



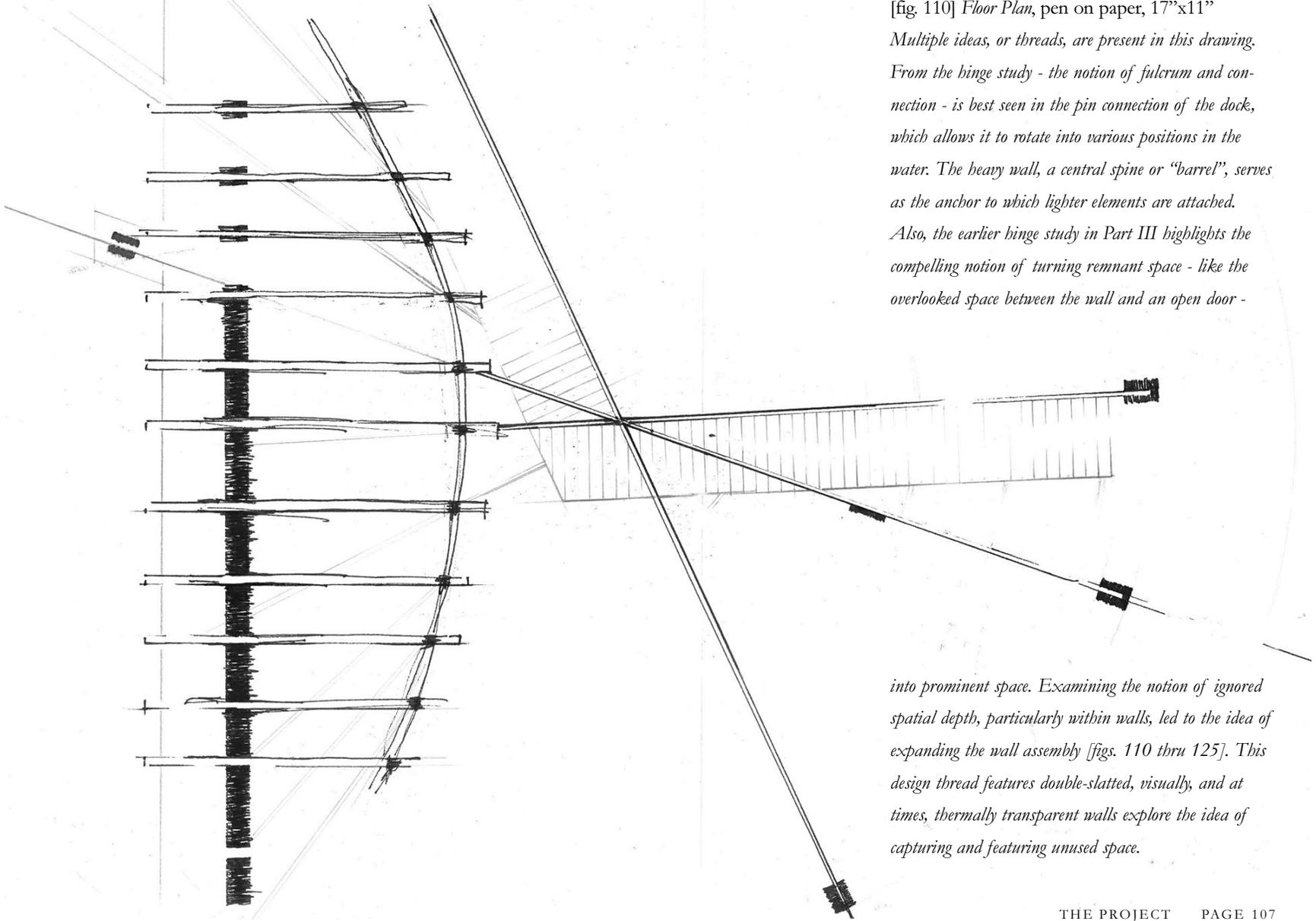
[fig. 107] *Land Elevation*, pencil on paper, 17"x11"

*Figures 106 and 107 are prime examples of how ideas developed in plan are drawn with other views in mind, in this case elevation. There is an effort made while drawing to carry ideas into all dimensions. Here, the scull storage is shown hung against the heavy wall with the delicate horizontal slats shown in the background. Notice the elevated roof that floats above the structural columns, again in a delicate connection much like what is seen in plan. The roof is also a curved form much like the curved, river-side slat wall seen in the images that follow. The density and paucity of the physical form and material is also an extension of the rhythm studies, which highlight the compression and extension of the rowing stroke.*



[fig. 108] *Workshop Study*, pencil on paper, 17"x11"  
*The notion of working both plan and elevation simultaneously on the same page can result in some interesting compositions. Often the juxtaposition of the images will suggest design opportunities not earlier seen.*

[fig. 109] *Workshop Study*, pencil on paper, 17"x11"  
*The connection and relationship between figures 108 & 109 with figures 75 and 76 is quite evident. What is less evident and must be noted is how the organizational logic of straight, thick wall to delicate curvilinear form is seen in both plan and elevation. Both perspectives are being examined in tandem under the lens of new ideas.*



[fig. 110] *Floor Plan*, pen on paper, 17"x11"

*Multiple ideas, or threads, are present in this drawing.*

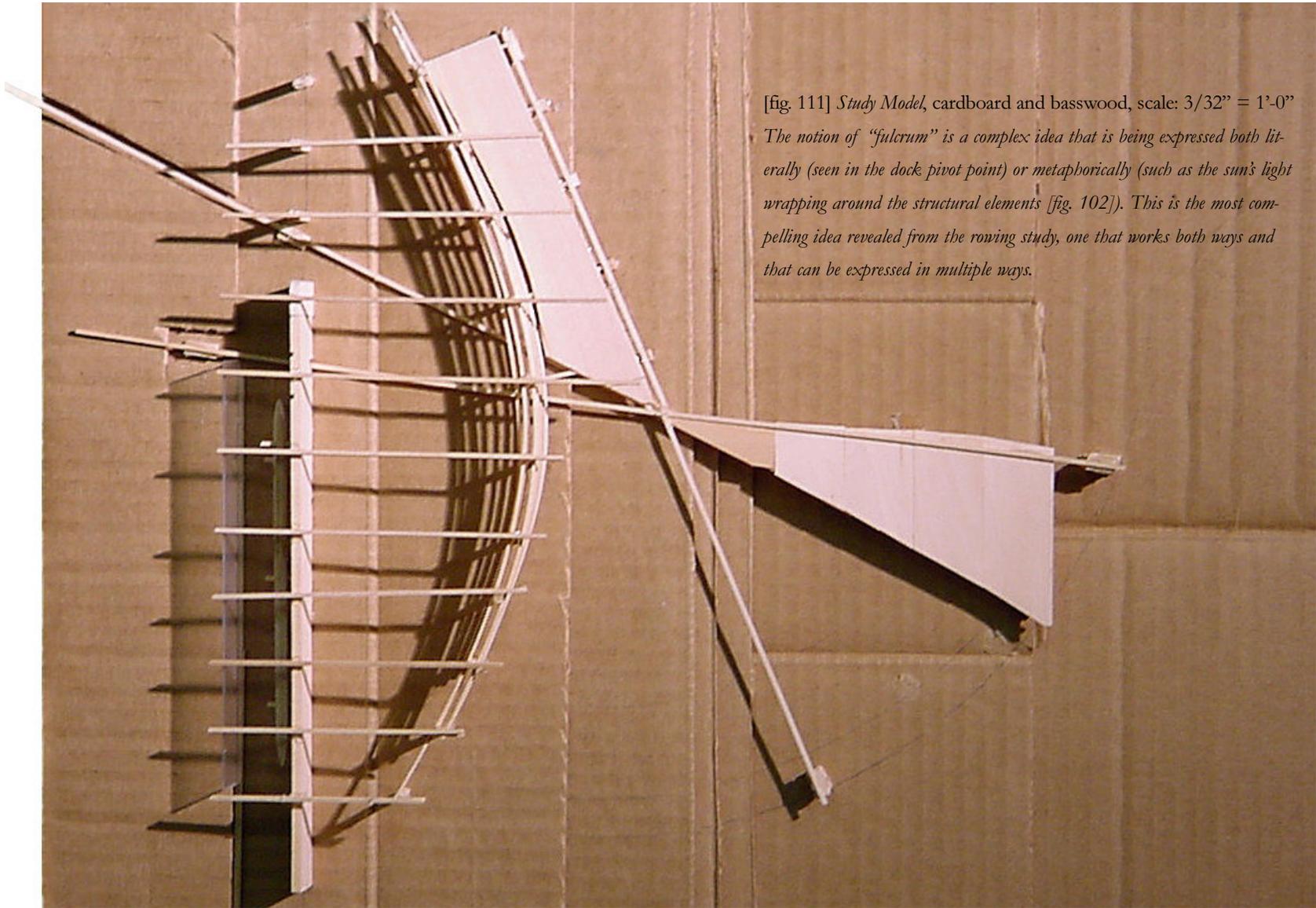
*From the hinge study - the notion of fulcrum and connection - is best seen in the pin connection of the dock,*

*which allows it to rotate into various positions in the water.*

*The heavy wall, a central spine or "barrel", serves as the anchor to which lighter elements are attached.*

*Also, the earlier hinge study in Part III highlights the compelling notion of turning remnant space - like the overlooked space between the wall and an open door -*

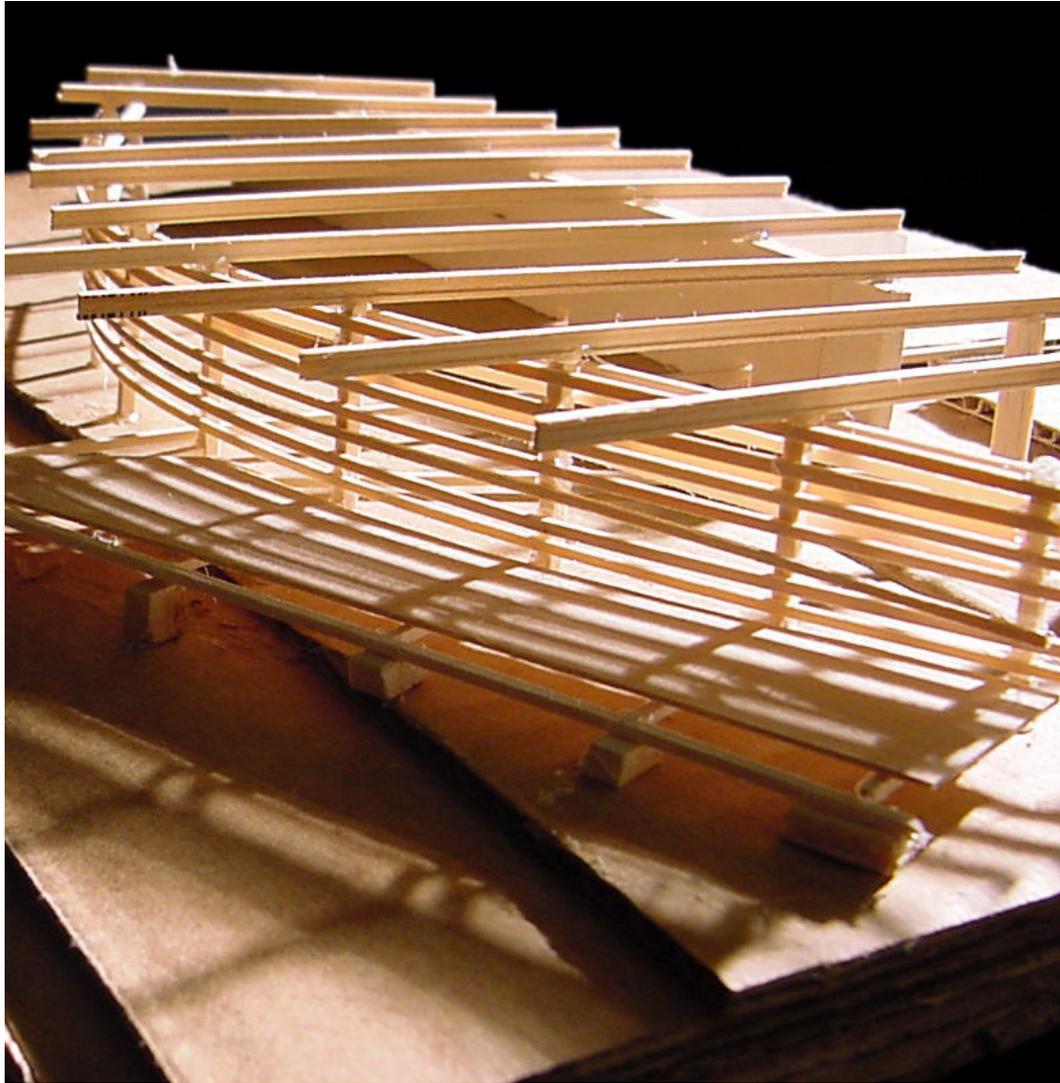
*into prominent space. Examining the notion of ignored spatial depth, particularly within walls, led to the idea of expanding the wall assembly [figs. 110 thru 125]. This design thread features double-slatted, visually, and at times, thermally transparent walls explore the idea of capturing and featuring unused space.*



[fig. 111] *Study Model*, cardboard and basswood, scale:  $3/32'' = 1'-0''$   
*The notion of "fulcrum" is a complex idea that is being expressed both literally (seen in the dock pivot point) or metaphorically (such as the sun's light wrapping around the structural elements [fig. 102]). This is the most compelling idea revealed from the rowing study, one that works both ways and that can be expressed in multiple ways.*



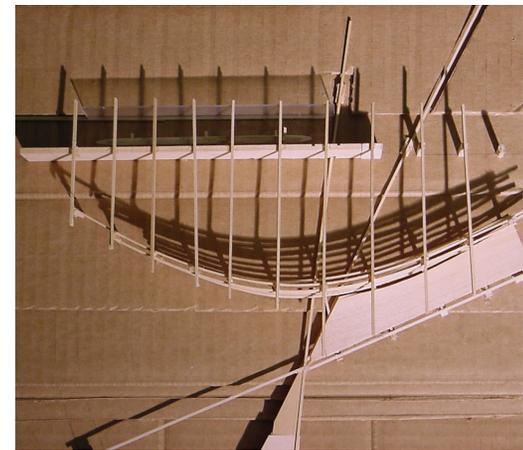
[fig. 112] *Study Model*, cardboard and basswood  
*The idea of “extension” found in the rowing study is expressed in the elongated, sinuous, structural elements, which initiate in the river and complete carved into the land (this idea is also seen in figure 111, which shows one element in the upper left hand corner running off the edge of the model).*



[fig. 113] *Study Model*, cardboard and basswood  
*The transparency of the double slat wall reinforces a connection, in this case visual, with the water.*



[fig. 114] *Study Model*, cardboard and basswood  
*Conceptually, by stretching or pulling the exterior walls from the spine, material is shredded and thinned.*



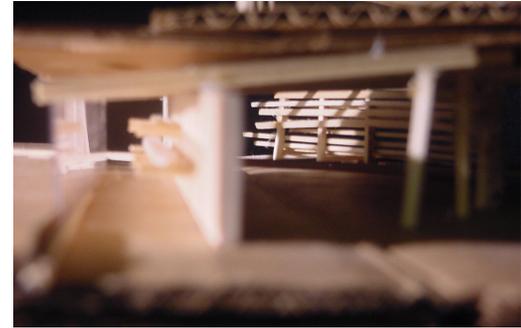
[fig. 115] *Study Model*, cardboard and basswood  
*Penetration of light through the wall.*



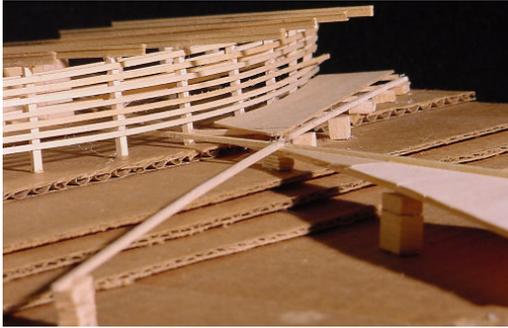
[fig. 116]



[fig. 117]



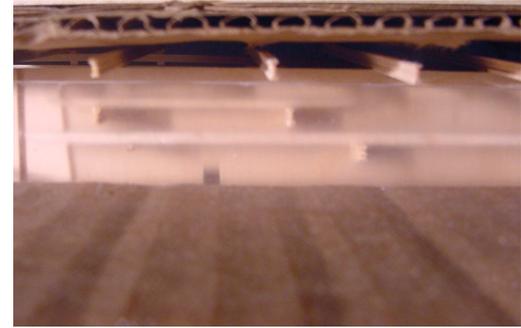
[fig. 118]



[fig. 119]



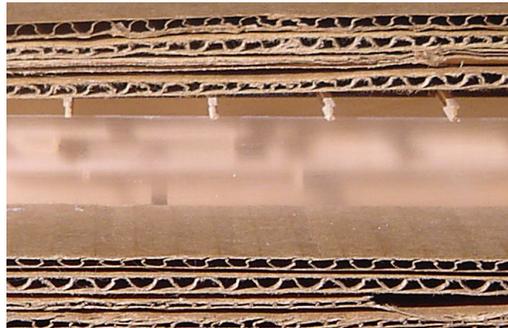
[fig. 120]



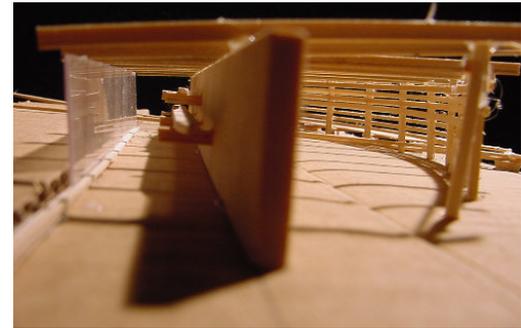
[fig. 121]



[fig. 122]

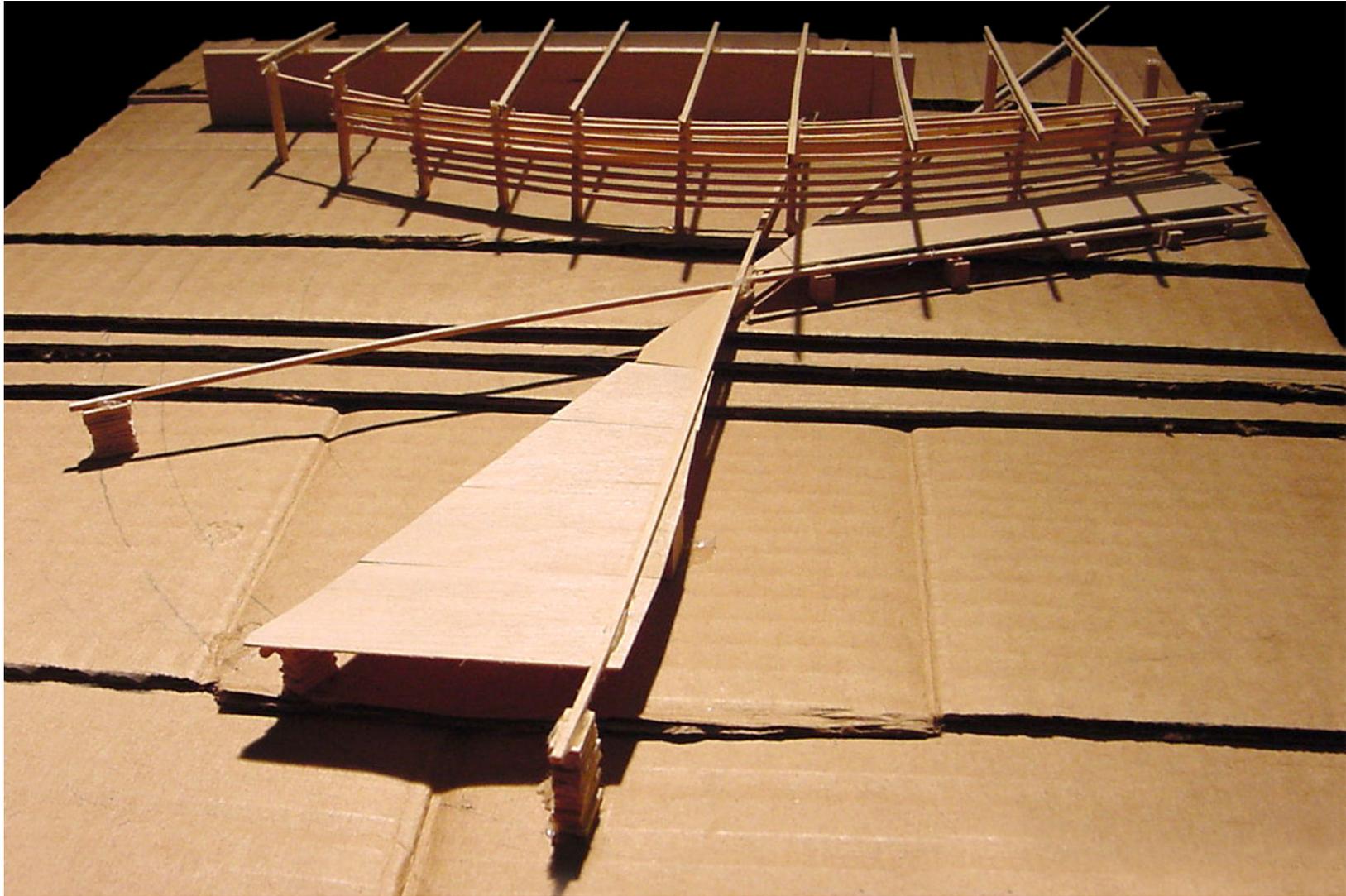


[fig. 123]



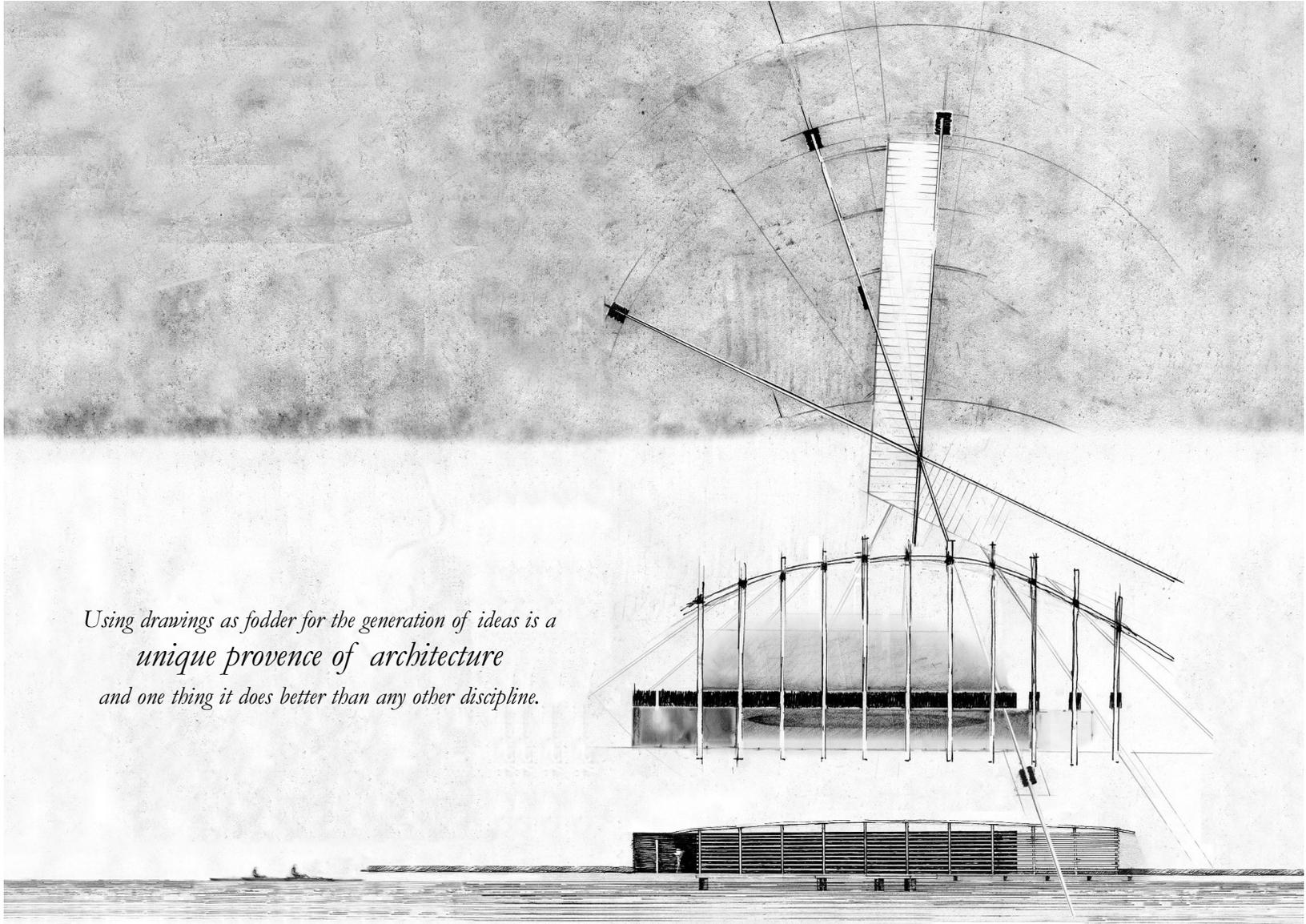
[fig. 124]

[figs. 116-124] *Study Model*, various images of interior space of threshold and border, scale: 3/32" = 1'-0"



[Above, fig. 125] *Study Model*, boatbuilder's workshop as seen from the river; [Page 113, fig. 126] *Final Study*, pen and pencil on trace, 17"x11"

*It is only appropriate that the final image on page 113 be a drawing, an image that best captures and reveals the intangible and unique nature of a boat builder's workshop. Fini!*



*Using drawings as fodder for the generation of ideas is a  
unique province of architecture  
and one thing it does better than any other discipline.*

# PART V: BIBLIOGRAPHY

## Bibliography

- American Rowing, Its Background and Tradition*, Robert F. Kelley, G. P. Putnam's Sons, New York, 1932
- Architectural Rendering, The Techniques of Contemporary Presentation*, Albert O. Halse, McGraw Hill, New York, 1988
- Architectural Representation Handbook*, Paul Laseau, McGraw Hill, New York, 2000
- Architecture and its Image, Eds.*, Eve Blau and Edward Kaufman, MIT Press, Cambridge,  
Arranged by Center Canadian d'Architecture, Montreal, 1989
- The Book of Rowing*, D. C. Shurbuck, The Overlook Press, Woodstock, 1988
- Branching, The Art of Michael Mayer*, Susan Danly and Rachel Rosenfield Lafo, Thames Printing Co., Inc., Norwich, 1997
- The Complete Sculler*, Richard Burnell, Sports Books Publisher, Toronto, 1989
- Complexity, Architecture/ Art/Philosophy, Ed.*, Andrew Benjamin, Academy Editions, Singapore, 1995
- Design Media, Techniques for Watercolor, Pen and Ink, Pastel and Colored Marker*, Ron Kasprisin, John Wiley & Sons, Inc. New York, 1999
- The Domain of Images*, James Elkins, Cornell University Press, Ithaca, 1999
- Drawing and Perceiving*, Douglas Cooper, 2nd. Ed., Van Nostrand Reinhold, New York, 1992
- Drawing Into Architecture, Ed.*, Dr. Andreas C. Papadakis, St. Martens Press, New York, 1989
- Envisioning Architecture, An Analysis of Drawing*, Iain Fraser & Rod Hesusie, Van Nostrand Reinhold, New York, 1994
- Jim Dine, The Alchemy of Images*, Marco Livingstone, The Monacelli Press, New York, 1998
- Michael Mayer, L'Inferno Di Dante*, Giorgio Marini & Ceil Friedman, Electa, Milan, 2000
- The Object Stares Back*, James Elkins, Simon & Schuster, New York, 1996
- Practice Architecture, Technique and Representation*, Stan Allen, Onescus Publishers Association, Singapore, 2000
- The Prints of Michael Mayer*, Trudy V. Hansen, Hudson Hills Press, New York, 2000
- Seeing is Forgetting the Name of the Thing One Sees*, Lawrence Weschler, University of California Press, Berkeley, 1982
- A Short History of American Rowing*, Thomas C. Mendenhall, Charles River Books, Boston, 1982
- Techniques of the Observer, On Vision and Modernity in the Nineteenth Century*, Jonathan Cray, MIT Press, Cambridge & London, 1991
- Thomas Eakins, The Rowing Pictures*, Helen A. Cooper, Yale University Press, New Haven, 1996