I, Emmanuel O Manolukas, hereby submit this original work as part of the requirements for the degree of Master of Architecture in Architecture.

It is entitled:
Catalytic Translations: Architectural Assemblage through Methods of Printmaking

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Catalytic Translations: 
Architectural Assemblage through Methods of Printmaking

A thesis submitted to the 
Graduate School 
of the University of Cincinnati 
in partial fulfillment of the 
requirements for the degree of 

Master of Architecture 
2017 

In the School of Architecture and 
Interior Design 
by 

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B.A. in Art University of North Carolina Pembroke 
May 2013 

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Abstract:

This thesis explores the notion of 'process' defined by physical and chemical manipulation within the visual art of printmaking to formulate translations into the medium of architecture. The analysis seeks to challenge the influence of the autonomous technological designer and restore meaning into the connections and tectonic realities that architecture can spatially share with disciplines of the hand. The breaking down of hierarchical sequence of process in both acid etching and relief printing are the basis for methodology and dissection. Investigations are initiated with the analysis of various printmaking techniques through the creation of prints or artifacts that illuminate the translation from two dimensions to three. The analysis of these artifacts provide a macro-tectonic understanding towards qualities of plate, ink, and paper providing a foundational concept within printmaking to then be intersected with features and principles of architecture. These intersections serve as the drivers that guide the manifestation of an architectural assemblage that translates the nature of the sequential printmaking process into a symbolic spatial experience.
Introduction

“Within the short unit of an etching line, there are fantastic things happening in the black ink, and none of those things are what one had in mind” - JASPER JOHNS

The following work is a journey of exploration and process that crosses the boundaries of mediums, attempting to discover meaning where few have thought to look. This journey unfolds with first, the conversation of translation: a verb that describes the movement of ideas from one form of expression to another. Walter Benjamin describes translation as “finding the particular intention toward the target language, which produces in that language the echo of the original.”

To understand the nature of translation is to begin to see the hidden truths that are contained in all experiences connected through intersecting lines of thought and process. This concept is examined within several architectural projects that also seek a means to express deeper connections to the structure of process, composition, and meaning from each original art form. Elizabeth Martin seeks to embody the nature of the musical process through the expression of geometric form using complex relationships between objects and events, between space and its purpose, and between time and distance. Similar to Martin is the design of Steven Holl's Stretto House, which analyzes music as an approach of confronting pressures toward the autonomy of architecture through the comparison of an existing musical arrangement. The unbuilt design of Guiseppe Terragni’s Danteum is also examined for its program-based translation of the epic poem The Divine Comedy. Terragni formulates his design with reference to literary narrative, embedding personified spatial markers to emulate the conditional relationship between visitor experience and implied environment. Also relevant is the work of Alexander Brodsky and Ilya Utkin; both use the etching process to create theoretical structures for theoretical worlds. Their work typically confronts social and technological issues of architecture and their affect on the human condition. Using etching as their primary mode of graphic representation, they are effectively translating an expression of human emotion and criticism towards the modern city and the failure of modern technology to facilitate a tolerable human environment. These projects help provide a basic understand of methodologies others have used to generate translations across mediums.

The translation explored in this thesis specifically investigates the processes of woodcut and etching, two diametrically different approaches to the creation of an image. The goal is to re-establish the importance of the hand in architecture, articulated through the translation of process on an architectural design. The search for a methodology that expresses the nature of the various printmaking processes will be pursued through the engagement and production of artifacts from each of the respective processes. The specificity of the chosen processes are those with the widest proliferation of use associated with the sharing of knowledge and art throughout printmaking’s historical timeline. Concern with re-incorporating elements of handcraft into architecture is a response to modern technological advancements in the form of digital automation within computer aided design programs and processes. The role of the architect is in the early stages of being challenged by the development of software capable of making design decisions and formulating solutions autonomously.

As a response to potential consequences of digital automation a project was formed which takes direct inspiration from the work of Brodsky and Utkin. Using a similar approach, a prospective future is portrayed: the environment defined by current social and technological trends. The key feature of this future is the neurological integration of the human brain with the digital realm. The prevalence of cell phones is now replaced with a
Nano-biological neural insert that expands and connects the human brain directly to a digital network. The existence of this technology fosters an entirely new perception of reality and what it means to have experiences. Distribution of written documents and printed images are obsolete and have ceased production. This future provides the framework for the ideas explored in this thesis to be exemplified in the form of a monument towards the dissolution of the printed image. The monument is planned to be sited near the Google headquarters in San Jose, California and is the embodiment of the process and history of the printed image. The ability to connect with a neural insert while on the grounds is disabled, reducing the perceptions of visitors to a time before the digital link. The design of the monument is the expression of various translations of the etching process that are implicitly and explicitly embedded into the experience.

For my Parents, thank you for your unrelenting support in all my pursuits.

The production of this document would not have been possible without the help and support of:

Laura Soria, who is a wizard when it comes to InDesign.
Abby Paljieg, who is a gracious and wonderful editor.
The many M.Arch’s who have shared ideas and opinions over beers at Arlins.
The M.Arch 1’s, WGSD
The art professors of UNCP, who inspired me to pursue architecture as a new medium.
# Contents

<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>iii</td>
<td>Abstract</td>
</tr>
<tr>
<td>vi</td>
<td>Introduction</td>
</tr>
<tr>
<td>ix</td>
<td>Acknowledgements</td>
</tr>
<tr>
<td>xii</td>
<td>List of Figures</td>
</tr>
<tr>
<td>1</td>
<td>Translation and Architecture</td>
</tr>
<tr>
<td></td>
<td>On Translation</td>
</tr>
<tr>
<td></td>
<td>On Architecture</td>
</tr>
<tr>
<td></td>
<td>y - condition</td>
</tr>
<tr>
<td></td>
<td>Stretto House</td>
</tr>
<tr>
<td></td>
<td>Danteum</td>
</tr>
<tr>
<td></td>
<td>Brodsky &amp; Utkin</td>
</tr>
<tr>
<td>67</td>
<td>Print Making</td>
</tr>
<tr>
<td></td>
<td>Process Methodology</td>
</tr>
<tr>
<td></td>
<td>Woodcut</td>
</tr>
<tr>
<td></td>
<td>Line Etch</td>
</tr>
<tr>
<td></td>
<td>Soft Ground</td>
</tr>
<tr>
<td></td>
<td>Aquatint</td>
</tr>
<tr>
<td></td>
<td>Intersections</td>
</tr>
<tr>
<td>109</td>
<td>The Project</td>
</tr>
<tr>
<td>111</td>
<td>2121 A.D.</td>
</tr>
<tr>
<td>113</td>
<td>Site</td>
</tr>
<tr>
<td>115</td>
<td>Program</td>
</tr>
<tr>
<td>119</td>
<td>Design</td>
</tr>
<tr>
<td>124</td>
<td>Concluding Notes</td>
</tr>
<tr>
<td>127</td>
<td>Endnotes</td>
</tr>
<tr>
<td>131</td>
<td>Bibliography</td>
</tr>
</tbody>
</table>
List of Figures

Rempen, Malachi Ray, Itchyfeetcomic.com, https://s-media-cache-ak0.pinimg.com/originals/9c/d0/72/9cd072daa63bed4d36835b5d01c509764.png (March 18, 2017)  
Kanekar, Aarati, Schematic of Divine Comedy. Drawing. Source: Architecture's Pretexts: Spaces of Translation  
Kanekar, Aarati, Danteum Diagram. Drawing. Source: Architecture's Pretexts: Spaces of Translation  
Kanekar, Aarati, Schematic of Divine Comedy. Drawing. Source: Architecture's Pretexts: Spaces of Translation  
Kanekar, Aarati, Danteum Diagram. Drawing. Source: Architecture's Pretexts: Spaces of Translation  
<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
<th>Source</th>
<th>Image Type</th>
<th>Date</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
<td>Terragni, Giuseppe, Danteum Purgatory. Drawing.</td>
<td><a href="https://paperarch.wordpress.com/the-danteum-of-giuseppe-terragni/">Source</a></td>
<td>Photograph.</td>
<td>2017</td>
<td>78</td>
</tr>
<tr>
<td>42</td>
<td>Terragni, Giuseppe, Danteum Paradise. Drawing.</td>
<td><a href="https://paperarch.wordpress.com/the-danteum-of-giuseppe-terragni/">Source</a></td>
<td>Photograph.</td>
<td>2017</td>
<td>80</td>
</tr>
<tr>
<td>44</td>
<td>Terragni, Giuseppe, Danteum Paradise. Render.</td>
<td><a href="http://archeyes.com/danteum-giuseppe-terragni/">Source</a></td>
<td>Photograph.</td>
<td>2017</td>
<td>84</td>
</tr>
<tr>
<td>44</td>
<td>Terragni, Giuseppe, Danteum Inferno. Drawing.</td>
<td><a href="http://gellyvieve.blogspot.com/2012/11/the-danteum.html/">Source</a></td>
<td>Photograph.</td>
<td>2017</td>
<td>86</td>
</tr>
<tr>
<td>44</td>
<td>Terragni, Giuseppe, Danteum Court. Drawing.</td>
<td><a href="http://ilgiornaledellarte.com/articoli/2015/6/124606.html">Source</a></td>
<td>Photograph.</td>
<td>2017</td>
<td>90</td>
</tr>
<tr>
<td>44</td>
<td>Terragni, Giuseppe, Danteum Model. Photograph.</td>
<td><a href="http://www.kotyrba.net/architekturfotografie-braunschweig-danteum/">Source</a></td>
<td>Photograph.</td>
<td>2017</td>
<td>92</td>
</tr>
<tr>
<td>60</td>
<td>Brodsky, Alexander &amp; Utkin, Ilya, Columbarium Architecturae.</td>
<td><a href="https://www.pinterest.com/pin/571323902705928633/">Source</a></td>
<td>Photograph.</td>
<td>1984-90</td>
<td>120</td>
</tr>
<tr>
<td>64</td>
<td>Brodsky, Alexander &amp; Utkin, Ilya, Columbarium Habitation.</td>
<td><a href="https://www.pinterest.com/pin/571323902705928633/">Source</a></td>
<td>Photograph.</td>
<td>1986</td>
<td>124</td>
</tr>
<tr>
<td>76</td>
<td>Defilipis, Francesco, Dome Drawings &amp; Diagrams.</td>
<td><a href="https://www.pinterest.com/pin/571323902705928633/">Source</a></td>
<td>Photograph.</td>
<td>1986</td>
<td>130</td>
</tr>
</tbody>
</table>

*Note: All images were accessed on March 18, 2017.*
<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
</table>
I

TRANSLATION +
ARCHITECTURE
ON TRANSLATION

The core and reoccurring concept of this thesis is the idea of translation. Most simply, translation is a conversion of "something" from one medium to another. Individuals most commonly experience the need for translation when encountering a foreign language. The question is: where in this scenario does the translation really reside? Is it in the literal meaning from one language converted to the other, or is it in the intent of the meaning? Walter Benjamin writes on translation and says the “task of the translator consists in finding the particular intention toward the target language, which produces in that language the echo of the original.”

For example, in German and French respectively the words “brot” and “pain” refer to a loaf of bread; what is meant is the same, but the way of meaning it is not. This difference in the way of meaning permits the word “brot” to mean something other to a German than what the word “pain” means to a Frenchman, so that these words are not interchangeable for them; in fact, they strive to exclude each other. As to what is meant, however, the two words signify the very same thing. To grasp the genuine relationship between an original and a translation requires an investigation analogous in its intention to the argument by which a critique of cognition would have to prove the impossibility of a theory of imitation. This law is one of the fundamental principles in the philosophy of language, but to understand it precisely a distinction must be drawn, in the concept of “intention,” between what is meant and the way of meaning it.

A translation, instead of imitating the sense of the original, must lovingly and in detail incorporate the original's way of meaning, thus making both the original and the translation recognizable as fragments of a greater language. This begs the question, what is the true translator's
function? Is it to take a single idea from say one language and convert the equivalent meaning over to the other language, bridging the gap of communication. Therefore is the goal communication, or is it perhaps the realization of a deeper truth?

Perhaps the more important task of the translator is to draw out a more relative understanding of intention and context through the merging of two understandings of either similar or dispirit things. In this way, the translator is taking the understanding from both sources and through the process of translating each, discovers a new unrealized meaning that is a result of the sum of the originals.⁸

The goal is not to create an imitation of one original and transpose it to another means of understanding, but rather to take the two opposing yet mutual understandings disconnected by barriers of communication and synthesize the truth of each into a greater understanding of the original.⁹

Language provides the most direct example for understanding the difficulties of translation, however the movement of ideas through visual and performative mediums also lends itself to the discovery of deeper truths. A goal of many artists, philosophers, and architects is to transcend the barriers of medium and exploit the capacity for greater variation, meaning, and understanding in forms derived across boundaries. Architecture as a medium is unique in that is expressed spatially, providing a potential to alter environmental perception while containing the capacity for implicit meaning via the incorporation of architectonics derived from literature, art, or culture. When comparing architecture to a literary creation, an individual reconstructs the pieces into whole-characters, events, places that are similar to experiencing the parts of a building in succession.¹⁰ The conceptual understanding of those sequences can then be mentally reconstructed to provide a greater depth of meaning towards the architecture.¹¹ Additionally, studies comparing architecture with other visual arts (e.g., painting and sculpture) are not uncommon. There are many instances whenin a branch of the visual arts draws
inspiration from another, and in some cases in a single work; architecture, sculpture and painting are intrinsically inter-linked to form a whole.\(^1\) Friedrich Kittler once said “To transfer messages from one medium to another always involves reshaping them to conform to new standards and materials.” There is always an element of metamorphosis when meaning is translated between one symbolic form to another so that the body of work undoubtedly becomes modified when perceived from different vantage points.\(^2\) The above quote suggests that to transfer meaning across mediums results in a transformation of form in the perception of said meaning, this also suggests that the transformation of meaning itself is inevitable. This becomes especially significant if one considers that an implicit aspect of translation is the manner of expression each medium presents content.\(^3\) In other words, the process of “making” is a determinative lens through which the conceptualization and construction of form originates within the arts. The externalization of art is implicitly linked to its medium of expression, and it is this logic of the medium that becomes significant in its conception and construction.\(^4\) The externalization of the medium needs to embrace the conceptual logic of the materiality or architectonic elements: rhythms, patterns, lines, shapes and the manner of their composition- constructional logic.\(^5\)

Comparisons between architecture and the arts may be common, however the idea of implementing the very structure of “making” or “process” from one of these arts into a concretized architectural project is not so common place. It is more often the case that the formula for a painting or sculpture is injected with principles of architecture rather than architecture embodying the principles of the former. Would it not broaden the potential of architecture to understand and utilize the conceptual logic of architectonic devices that reside within the visual arts? This question is the focus of thesis: to understand and implement into architecture aspects present in the process of making, using printmaking as a vehicle for translation. The goal of the translation is to facilitate understanding of the printmaking process and translate the logic of the medium, culminating in an architectural response that embodies the intent and expression of the process.
To defend such a thesis, investigations of existing work that utilize translation as an integral theme are necessary. These studies do not limit themselves to the visual arts but also examine architectural translations generated from fictional narrative and musical composition. The following projects are reviewed to understand: theoretical framework, methodology, and conclusion in either the form of a built project or series of drawings.

**y - condition:**
Elizabeth Martin
pp. 9

**Stretto House:**
Steven Holl
pp. 25

**Danteum:**
Guiseppe Terragni
pp. 35

**Various works:**
Alexander Brodsky & Ilya Utkin
pp. 47
Elizabeth Martin’s project, the y-condition, is a translation of music to architecture. Her title cleverly alludes to the seemingly ethereal nature of translation through what she calls the y-condition, a condition she defines through phonetics of semi-tone. Martin explains that a semi-tone is a transitional sound heard during articulation, linking two phonemically contiguous sounds such as the ‘y’ sound often heard between the ‘i’ and ‘e’ of quiet. Martin suggests the connection of the semi-tone or y-condition to a membrane that occupies the middle position between music + architecture, a condition that appears when translating one from the other.

The aim of her investigation is to explore as a design tool the idea of translation defined as a “rendering of the same ideas in a different language from the original.” The two art forms are explored in a comparative way to discover a methodology that leads to a means of expressing the y-condition. “In their rudimentary media of expression, such as notes, meters, tones and lines, colors and geometrical forms, the union is carried on by their respective systems of artistic and imaginative composition, design and execution.”
Program

Martin chose a program that she felt naturally resonated with the theories of minimal music. The program is based on the concept of what Lebbeus Woods calls an Epicyclarium, a theoretical high-tech earth station in which a synthesis of the entire field of knowledge can occur. Its structure is composed of the forms and spaces that house the instruments of an advanced electronic technology and a staff of creative scientists necessary to gather a vast and diverse body of knowledge.22
Site

The site is metaphorically connected to the natural form of a mesa. This is deduced by connecting characteristics of minimal music to a natural form that would illustrate those qualities. Those characteristics are: simplicity, repetition, illusion/perception, events, phase shifting, complexity, and sudden alteration of density. Some characteristics are only visible by the physical viewing of a mesa while, other characteristics appear when analyzing topographical maps/geo-notation systems.

Investigation

The investigation begins with an analysis of scores from minimal classical composers, such as Steven Reich, Terry Riley, and Philip Glass. Martin defines minimal music as an extreme reduction of the musical means in terms of harmony, counterpoint, and the theory of form. A breakdown of these terms:

- **Harmony** – the doctrine of chords and their possible connection with regard to their tectonic, melodic, and rhythmic values and relative weights.
- **Counterpoint** – the doctrine of the movement of voices with regard to motivic combination.
- **Theory of form** – deals with disposition for the construction and development of musical thoughts.

Martin’s analysis defines six attributes to dissect the nature of minimal music into concepts that will function as a foundation for translation and drive the formulation of design tools. Each attribute is accompanied by a graphic Martin’s original analysis.
I. LINEAR-CYCLICAL

Creates cycles of events rather than a linear sequence. A linear sequence is end-oriented, similar to a traditional classic novel where the denouement resolves the conflict of the plot. A cycle of events the stages that is reminiscent of an assembly line in a factory.

II. TRADITIONAL REPETITION

Focuses on musical components like rhythm, melody, and harmony. Pre-figured by underlying dramatized construction, symbolization of situations, and limitation of action.

III. MINIMAL REPETITION

Creates a feeling of movement. The pulse pulls attention away from the details of the form to the overall process. The piece of music is literally the process.

IV. OBJECT-SPACE RELATIONSHIP

Sudden alterations of density, a once modular figure is stretched and contracted over a constant pattern of sound material.
V. LAYERED PLANES

CREATES LAYERED TEXTURES OF MUSICAL PLANES BY MESHING DIFFERENT TEMPOS AND RHYTHMIC PATTERNS. PENETRATES THE INNER ESSENCE OF SOUND BY BRINGING OUT THE SIMPLICITY AND COMPLEXITY. 30

VI. PHASE-SHIFTING

FOCUSES ON REPETITIVE CYCLES WHERE THE BASIC FORM IS REPEATED AND PHASE-SHIFTED. A FIXED PART REPEATS THE BASIC PATTERN THROUGHOUT THE PIECE WHILE THE SECOND PART ACCELERATES TO TAKE IT OUT OF PHASE. 31

5

Methodology

Using the attributes defined in her investigation, Martin begin a methodology that systematically sequences the structure of her analysis to generate a design for her building.

Graphic Music

Elizabeth composes a graphic piece of minimal music using a numerical system, which she also used to create a building. In the graphically composed music drawing, one square equals one eighth note, within a range of forty-five notes and a pattern of duration; symbols are assigned to various modes of articulation and a simple set of rhythmic cells are created, connected by lines of chord members and successive notes at the same dynamic level to complete the structure. 32
In composing the building: One square equals the smallest unit represented as a beam, wall, or floor plane—within a range of forty-five units and a pattern of duration; symbols \((a_1, a_2, a_3\) and \((b_1, b_2, b_3)\) are assigned to various modes of articulation and a simple set of spatial units are stretched and compressed in time and then connected by lines of relationships with the same spatial quality to complete the structure. The resulting drawing is the framework for her y-condition.

**Cycle of events**

In minimal music, tempos and rhythmic patterns are meshed together, creating layered planes. At certain points all lines in the piece emphasizing the first beat of a particular measure interlock, creating a cycle of events. Specifically, a cycle of events are coincidental meetings of the different phases at a point of interlock following a mathematical system determining a spatial position.

**Alteration of Density**

Another characteristic of minimal music is that it is structured to create the feeling of movement. Due to the sudden alteration of density, one modular figure is added or subtracted from itself and layered over a constant pattern of sound material. The result is a number of rising and falling composite figures that are stretched and compressed, creating a restricted or extended time-sense. This affects the cubic elements of the Epicyclarium, which move along a mechanical track that is divided into 365 increments. This movement represents the cycle of the year. The movement of the structures creates an ever-changing spatial relationship in a rhythmic-arithmetic manner, resulting in an alteration of density.
Phase-Shifted space
For the cycle of events that occur in the Epicyclarium, the phase-shifted space determines the form. In the phase shift, a fixed part repeats the basic pattern throughout a composition while the second part accelerates to take it out of phase.\textsuperscript{40} This produces an ever-changing alignment against the first part and results in the stressing of constantly different notes.\textsuperscript{31} In this particular case, the first plane remains a constant while the second and third planes are shifted slightly.\textsuperscript{42}

Transformation of Dimension
Using measurements of defining structural, sectional, and site relationships, Elizabeth calculates a dimensional analysis of internal and external space conditions using proportional factors.\textsuperscript{43} This analysis helps determine dimensions of the façade. She argues that setting up such a series of relationships is analogous to the method for initiating the composition of the piece of minimal music.
Repetition as a form of Discovery
The y-condition creates things removed from their conventional architectural or musical representations. The Epicyclarium, one possible manifestation of the y-condition, describes complex relationships between objects and events, between space and its purpose, between time and distance, between visual and aural, between movement and object. The process of exploration of the y-condition leads to a discovery that can only be seen against the backdrop of another discovery and another and another and another.

Takeaway
The y-condition provides an insightful precedent for approaching the concept of translation through a process-based methodology. This provides her with a clear foundation to generate an architectural design through similar methods one would compose a minimalist musical arrangement. The main takeaway is her method of “rendering of the same ideas in a different language from the original”. Martin’s breakdown of the compositional process of minimal music provides her with the design tools needed to generated architecture that relates to directly to the structure and formulation of music.
“Stretto in music is applied to the entrances of compositional themes, usually in fugal works, where the different voices do not wait for each other to finish stating the fugal subject but pile in on top of each other. It is important not to confuse the polyphonic form of a cannon with the device of the Stretto. In a cannon the imitation is continuous, preserving a fair distance between voices, while in a stretto it is momentary and accelerated—occurring in rapid succession. The result is an allusion of concentration of musical matter and an accelerating clash of musical events.” - KLAUS LIEPMANN

The analogies made between music and architecture have historically generated an overwrought territory of comparison along narrow channels of interaction: number, rhythm, notation, and proportion. Where music has materiality in instrumentation and sound, architecture attempts an analogue in space and light. Transference of essential properties or ideas from one art to another could occur through channels not primary to either. In order to look further into transposition along other lines, one could think of architecture and music as unknowns and solve an equation for two unknowns.

In this case the basis for translation from music to architecture is Bela Bartok’s 1936 *Music for Strings, Percussion and Celesta*. Steven Holl uses this composition as a sort of raw material to then design the house in parallel to it.
Located outside Dallas, Texas, the site is adjacent to three ponds with existing concrete dams. The Stretto House projects the character of the site in a series of concrete block “spatial dams” with metal framed “aqueous space” flowing through them.\textsuperscript{51} Coursing over the dams, like the overlapping Stretto in music, water is an overlapping reflection of the landscape outside as well as the virtual overlapping of the space inside.\textsuperscript{52}

In music as well as in architecture, form, rhythm, proportion, and mathematics are the elementary importance.\textsuperscript{53}

“We are concerned not only with achievements of purely scientific issues, but also those which have a stimulating effect on composers. According to the natural order of things, practice comes theory”.\textsuperscript{54} – Bela Bartok

In architecture the process often informs the result; in the case of the Stretto house, the process involves the breakdown of Bartok’s composition to understand the ways in which architecture may relate through space and light. Bartok’s composition contains four movements and has a distinct division in materiality between heavy (percussion) and light (strings).\textsuperscript{55} Correlatively the Stretto House is formed in four sections, each consisting of two modes: heavy orthogonal masonry and light curvilinear metal. The materials not only relate to the nature of the sounds but are common within the Texan architectural vernacular.

Throughout the house and guesthouse, Steven Holl creates a dichotomy of spatial perception through the geometry of the drawing and relationship of plan and section.\textsuperscript{56} The plan of the main house is purely orthogonal, while the section is curvilinear. The guesthouse on the other hand is an inversion of this relationship with the plan curvilinear and section orthogonal; similar inversions are present in the first movement of Bartok’s score.\textsuperscript{57}
The spatial relationship created from the rectangular contrasted with the curvilinear becomes a mismatch that results from the meeting of the golden mean with the curve. In the main house, aqueous space is developed by several means: floor plans pull the level of one space through to the next, roof planes pull space over walls, and an arched wall pulls light down from a skylight. Since the aqueous spaces remain through the medium of the mismatches, there also results a multi-layered combination of mismatches similar to that used by Bartok in his score.
The house provokes a feeling of a buried secret or perhaps an underlying theme that resides outside of the perceived architecture. The secret is a result of Bartok’s mathematical obsession within musical composition and Steven Holl’s ensuing translation.

Bartok’s use of the Fibonacci sequence in his score defines the movements and layering of mismatches as the piece unfolds with each bar. The movements from bar to bar follow the Fibonacci’s unending sequence of numbers: 1, 2, 3, 4, 5, 8, 13, 21, 34, etc. where each term is defined as the sum of its two predecessors or $a:b = a + b$, $a<b$.

Based on this unending numerical sequence, Bartok orchestrates major movements within the piece based on the corresponding bar measure, with 89 in the entirety of the piece. The layering of mismatches is a compositional tool deployed by Bartok throughout his music. This same concept is then applied to the architecture of the Stretto house and provides the raw material that defines resulting details in the house.

The Golden Section is defined as the portion of the two divisions of a straight line such that the smaller is the sum of the two. The Stretto house also uses Golden section relationships throughout expressed by: solid/void relationships of walls and openings, window mullions, mirrors, cabinets, and drawers. Almost every surface has a trace of the Golden Section overlaid with a second set of curved references.
Conclusion

"Two children from totally different cultures, lacking a shared language, could meet and "interact" by means other than verbal correspondence."66 "Collapsed boundaries open crossroads and galleries of connection between mediums creating opportunities to establish a more direct architecture in the dynamic condition of twentieth-century culture."70 Analyzing music as an approach to architecture is only one way of confronting pressures toward autonomy of architecture, or its validation by historical precedent alone.71

Takeaway

The methodology of comparison between Bartok’s composition and the representation of physical structure in diametrically opposing geometries as expressed through plan and section are integral to the further exploration of translation within architecture. Holl’s approach of articulating the form of solid/void relationships of architectural features through Bartok’s implicit numerical expressions of both the Fibonacci sequence and golden ratio serve to provide foundation on how one might directly link foreign structures of language into a spatial expression.
The translation and representation of fictional narratives in theater, music, paintings, and even sculpture is quite widespread, but the same cannot be said about their representation in architecture. Guiseppe Terragni’s unbuilt Danteum project has long been the prime example for discussing narrative space due to its direct relationship to Dante’s poem *The Divine Comedy*. The project is of special interest precisely because it takes the poem as its architectural design program. Guiseppe Terragni created the design for Danteum project for the 1942 exposition in Rome. The project, as mentioned above, was never constructed yet serves as a prime example how an iconic piece of literature can be translated into a spatial narrative experienced through architecture. Using the analysis of Aarati Kanekar, and understanding of narrative in architecture is extracted from the designs of the Danteum.

The building is articulated in four major parts: an entrance court open to the sky, an area adjacent to the entrance with a dense regular grid of marble columns, two rooms intended to represent purgatory and inferno, and a second floor over the grid of columns with floor and columns made of glass to representing paradise. Terragni uses a variety tools to define the journey depicted in *The Divine Comedy*. One example is the typological connections to byzantine churches in the idea of ascending spatial hierarchy; labyrinth patterns on church floors represent the underworld while the high vaulted ceilings represent the heavens. The unfolding of events along a specific path reinforce the idea narrative; a device used by architects since ancient times. Connecting major areas “thresholds are handled so as to emphasize discontinuity rather than flow.” The poetic map is a medium through which emotions are expressed. The Danteum succeeds in capturing this particular and rather central aspect of the
Particular design decisions are justified by analogy to aspects of the formal compositional structure of the poem, including numerical relationships. What the Danteum does above all else, as architecture, is stage the column; not the column as a structural element, but the column as a device that organizes space, or as a figure that makes claims over space in its own right. In staging the column as a means and also as an end of spatial organization, the Danteum sets itself up to face both the classical tradition for which the column is the main bearer of the definition of the orders of architecture, and the modern perception of the column as a minimal structural element that frees the organization of space. The tight control of overall geometry, the adherence to a proportional system, and the consistent treatment of wall surfaces suggest a unifying intellectual rigor aimed at containing what is otherwise such a strongly diversified collection of intense spatial experiences.
2 Design / Methodology

The hermetic closure of the building as a whole evokes less the form of a statue, the typical mode of representation that reconstitutes presence, and more the tomb/cenotaph, which normally monumentalizes absence. Upon entering the visitor first confronts 100 travertine columns laid out on a 10x10 grid; this is taken to represent the forest at the beginning of the poem in which the poet becomes lost. The columns may also symbolize “human multitude” with the columns as abstracted personifications of the human body. The dense spacing of the columns serves to separate and disperse visitors that transverse the area.

The second interaction with columns happens in the Inferno portion. Seven columns of decreasing radius are centered on an arrangement of squares successively inserted within golden-section rectangles, so as to suggest a spiral. The largest column faces the entrance, while the smallest is the furthest back. Each column supports a corresponding detached portion of ceiling at variable heights; simultaneously the sections of floor around each column are recessed in a descending proportional manner. The idea of seven references the seven deadly sins rather than 9 rings of hell described in the poem; however the proportional decline in horizontal plane and discontinuity of the ceiling suggest a representation of the separate levels of inferno in which the elements of light and compression are manipulated as the spiral downwards.

The next area, purgatory, is completely void of columns. The floor planes, like in inferno, are based on golden-section rectangles and proportionally step up in as the visitor transverses the space much in the opposite manner as the inferno. “The room is open to the sky; there are only small zones covered by slabs and a pattern of beams that resonates with the
arrangement of the floor. Thus, one is given the strong impression that the absent columns could be provisionally replaced by the transient bodies of visitors and distributed over this stratified environment as if in the landscapes of Purgatory.  

Paradise is similar to the entrance court in that it is a grid of columns directly above the forest below; however the columns in this room are made of glass, as is the floor between the columns revealing the forest and visitors below.  

As visitors engage with the space, views and perception of distance become blurred, refracted, and reflected by the glass, creating a pattern of co-presence at undecipherable intervals of distance. The glass columns are believed to represent the pure souls of angels described in the poem.  

The Empyrean, an intermediate feature, acts as a hallway that connects purgatory, paradise, and the entrance/exit. This space is potentially missed if the visitor explores paradise directly from purgatory. It is also a space that the visitor could potentially reach first by entering the building from the exit stair, providing views of all other prospective spaces of the building emulating a God-like view that enlightens the view to the journey and tension the narrative spaces create. This aspect in terms of representation symbolizes the possibility of the visitor ascending to a communal space with God immediately from the physical world; this is only understood if the visitor chooses to experience the building in the reverse direction.
Throughout the Comedy, great stress is placed on the contrast between Dante’s body and the souls of the dead, some of whom long for their living body while suffering. In the inferno bodies are classified in a strongly discontinuous landscape, as if to create a map of both sin and punishment for all time. In purgatory the bodies are indirectly referenced by their shadow, or its absence. In paradise space is only differentiated according to the intensity of light and the presence of bodies, however dematerialized. Thus, the body forms the map in paradise, while the map situates the body in the Inferno.
Conclusion

"The translation becomes not a reproduction but a reincarnation of the original, taking on a life of its own in a new language: The task of the translator consists in finding that intended effect upon the language into which he is translating which produces in it the echo of the original."\(^{103}\)
Terragni’s architectural project can be read more easily as a metaphorical statement about the transfigurations of the human body than as an attempt to represent or to stage the environmental settings decried in the poem. In this context, the difficulty of depicting paradise is resolved in an ingenious way that directly bears on the dual function of physical structures in architecture, both as devices that transform and organize space and as material constructions subject to the laws of physics.\(^{104}\)
At the deepest level of design formulation, Terragni recognized that a monument is an extreme moment for architecture and, therefore, associated the design of the Danteum with a reflexive questioning of architecture’s fundamental premises: ground, structure, support, stability, boundary.\(^{105}\)

Takeaway

Terragni’s project is presented because of the way that it uses symbolic and spatial architectural forms as a vehicle to translate meaning from a narrative structure of a separate medium. The narrative of this thesis, unlike the Danteum, is the narrative of physical process rather than literary progression. The nature of the minimal yet monumental spaces created are devices that inform structures within the final project.
Alexander Brodsky and Ilya Utkin were classmates at the Moscow Institute of Architecture (MArkhi) in the mid-70’s. They collaborated closely throughout their schooling and even shared a joint thesis project. After graduating they continued to collaborate, creating projects in the manner of “paper architecture” utilizing etching as their primary graphic representation style.

Many of the resulting prints were designed as critical social responses and submitted to a variety of international design competitions for foreign magazines and corporations. Their designs often take on an otherworldly aesthetic that seek “to address the human condition in all its psychological and social dimensions, and not merely to provide shelter for physical bodies.” Within the work they often elude to “The abysmal failure of modern technology” to provide tolerable environments as well as co-exist within social and cultural infrastructures within the cold war era USSR.

The work is heavily influenced by the Beaux-Arts-style composite drawing or “analytique” The format of the analytique creates a collage of plan, elevation, section, perspectives, and details sometimes at varying scales. Paragraphs of text accompanying many of the plates elaborate on the designers’ conception of the project. Their shared love of historical architecture, architectural relics, literature, cultural motifs, mythology, and the metropolis of the time often heavily influence the content of both the text and images they produced.

The work of Brodsky and Utkin is highly influential to this thesis as it is the only precedent that utilizes the language of printmaking to comment, critique, and criticize the social and developmental ramification
of architecture. The nature of the graphic quality expressed in each of their images is a resultant of the various process and sub-process within etching. They serve to create a quality of visual representation that aids in the narrative and believability of the typically absurd and exaggerated theoretical scenarios and designs.

The following are a collection of various design submissions for architecture competitions:
Plate 6. Crystal Palace. 1989/90. (32 7/8" x 23 1/4")

Sea-weed swarms with
Transparent [minnows] Catch them-
They shall thaw without a trace.

Basho

Crystal Palace is a beautiful but unrealizable
dream, a Mirage which calls you always, seen
at the edge of [the] visible. But as each dream [is seen] in
close examination, it will prove the other thing
than it seemed [from] afar. [It stands on the edge of the city.]
A person who wants to visit it
will make a long way through the town
borderland, blocks of slums and dumps but coming
at last to the Palace find neither roof nor
walls – only the huge glass chink to another, a visitor will
walk [through] the Palace . . . and find himself at
the border of a small square, where the Landscape
commences . . . Did he learn the very essence of the Crystal
Palace? Will he have a desire to visit it once more?
Nobody knows . . ."}

Notes:
Took first prize in the 1982 Japanese competition. Marked the pair’s
breakthrough to a means of visual and verbal expression that they would
continue to exploit throughout the eighties and that characterizes the
majority of the etchings documented here. To approach the structure one
must journey through the fragments of the city: slums, blocks, dump via a
long path or promenade. The glass nature of the structure gives the illusion
of depth and changing complexity of lines from a distance. However upon
approaching one realizes there are no walls or roof, only giant glass plates
stuck into large raised platform. The mirage remains a mirage, at the end
revealing the lie and framing a view of the natural landscape beyond.
Why does a Man build a Tower?
To fight off enemies? To transmit TV programs?
To house more inhabitants and to
economize high costly earth? No, no [and] no!
That’s a lie and the masking of the real [and]
the only true function of a Tower [-] to shout
as loud as possible: “Here I am! Look how strong
and mighty I am!” All the rest – the elevators,
the floors and the countless clerks
filling the Tower [-] exist only to put on a mask.
Let us build at last the Real Tower- “A Glass
Tower for a Little Man.” It will be a gigantic
glass cylinder standin[g] in the very
center of a town. There will be nothing inside
but a little glass room with a narrow
and steep glass staircase leading to it.
A man can go upstairs, and at the moment
he enters the room, his Old Dream comes true:
Due to the newest technical inventions and
wonderful nature of glass, a little Man will
fill in by himself the gigantic Tower. And
all the town will see him, and every tremendously
enlarged spot on his nice face will
shout: “Look, here I am!” Afterwards the
Little Man will go downstairs and the Great
Man will disappear to give place to the next
one . . . So welcome to the Glass Tower! ! !
(Works day & night).
Notes:
Provides an intriguing perspective on the true nature of large structures that emulate the current state of technological advancement, subtle reference to the Tower of Babel. The text effectively sets up a “futuristic” scenario in which this structure would exist; yet relates itself to the timeless desires of “Man” as well as the nature of monumental architecture of the past (pyramids/babel). A diagram at the bottom of the page discreetly compares the tower with the pyramids: in ancient civilizations the tiny corpse of a pharaoh was hidden within a windowless stone tomb; modern man dreams rather of exhibiting himself on a colossal scale. Mythological motifs, such as the winged figures in the background are representative of Icarus, a reference to the pursuit and danger, when combined with pride, of invention.
Plate 18. *Island of Stability*. 1989/90. (31 1/8” x 23 1/4”)

Island of Stability
or the open-sky museum of stone sculpture in the centre of the town.

For those who are tired of plastic vanity, for those who feel sick of foam rubber life, for those who believe in heavy things that are difficult to move . . . 116

Notes:
The idea of the relentlessness of time and the transfer of values, resulting in the building up of statues, architectural relics, and monuments that are heaped and discarded in the public square. Preservation of historical features, (architecture, art, monuments), to direct allusions to the past through the process of updating them for current use to preserve the heritage in our collective memory. The sentimentality towards historical artifacts in this piece is likely a response to their perception of the modernization of Moscow and the loss of urban identity.
Plate 2. Columbarium Architecturae (Museum of Disappearing Buildings). 1984/90. (32 1/8” x 22 1/2”)
Union of Architects of USSR Competition, Moscow, USSR, 1984.

[English translation of Russian text]

Museum of Disappearing Buildings

“They had to tear down an old house in order to build a new one in its place. I led the architect through the empty rooms and among other things told him various stories. Torn wallpaper, dirty windows, blackened furnaces - all this bore the traces of recent life and evoked memories. On this very staircase, for instance, a drunken group once carried a dead man; they tripped and tumbled downstairs along with the coffin; the living were painfully bruised, but the deceased was very serious and shook his head as if nothing had happened when they lifted him from the floor and placed him in the coffin once again. There are three doors in a row: young ladies lived there; and as they frequently entertained guests, they dressed better than all the other inhabitants and punctually paid the rent. The door at the end of the hallway leads to the laundry where they washed clothes during the daytime and at night drank beer . . . and in this room a poor musician lived for ten years. When he died they found twenty thousand in his feather bed.”

Anton Chekov, The Old House
Houseowner’s Tale

The building that we propose for the given plot we have called “The Museum of Disappearing Buildings.” It’s hard to say how many old buildings, both large and small, beautiful and not very beautiful, have disappeared from our city in recent years. It’s even harder to say how many of them will disappear in the near future.
Some were torn down in order to build new ones in their place; others because they stood too close to a new construction site and might ruin the view. Yet others were destroyed simply to create more open space, or perhaps even for other reasons. In any event, one fine day the building was surrounded by a fence and people who had seen it every morning throughout their lives knew: tomorrow it wouldn’t be there any longer. The museum that we propose is called upon to preserve the memory of all disappearing buildings, regardless of whether, during their lifetime, they were architectural monuments or were visited by great and famous people. Each disappearing building, even the most unprepossessing, is an equal exhibit in the museum. After all, each is suffused with the soul of its architect; builders, inhabitants, and even the passerby who happened to cast an absent-minded glance its way.\textsuperscript{118}

The Inhabited Columbarium or the reservation for old little houses and their inhabitants in a large modern city

A House dies twice – the first time when people leave it; then it can be saved if they return. The second time finally when it’s destroyed . . . In some big city where the modern architecture almost pushed out old buildings there are still a number of old little houses with people living there for many years. All these houses must be destroyed according to a general city plan and people living in them must receive flats in new buildings. There is only one possibility for the owner of such a house to save it: let them take the house from its place and put it into a Columbarium – a huge concrete cube standing in the center of the city. But they do it only if the owner and his family continue living in their house – now standing on a shelf in a concrete box. While they live in it the house lives also; but if they cannot live in these conditions any more and refuse,
their house is destroyed.
And its place becomes empty
waiting for the next one . . .

3

Takeaway

The work of Brodsky & Utkin is possibly the most influential in the final production of a project to embody this thesis investigation. The use of etching as graphic medium for representation of architectural ideas and criticism is not only powerful but also relevant to this analysis of process and the qualities that visual expression as they pertain to the affects of the various steps. Additionally the method of creating futuristic narratives that pertain to the present conditions of architecture and the human response, open up possibilities for how a potential design could be sited in the realm of conception and meaning towards any particular criticism in the future.
II

PRINT MAKING
## Process Methodology

The first step in the research methodology involves an examination of both relief and intaglio techniques through the production of blocks, plates, and prints. Engaging in these processes and isolating the various techniques and sequential sub-processes is an essential step in order to explicate their distinct natures and tectonic relationships to the various elements involved (plate, ink, paper). Defining these relationships provides the foundational drivers for architectural translation.

## Techniques

<table>
<thead>
<tr>
<th>Technique</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woodcut</td>
<td>pp. 69</td>
</tr>
<tr>
<td>Line Etching</td>
<td>pp. 81</td>
</tr>
<tr>
<td>Soft Ground</td>
<td>pp. 89</td>
</tr>
<tr>
<td>Aquatint</td>
<td>pp. 97</td>
</tr>
</tbody>
</table>
1

Historical Influence

The art of printing from woodblocks was invented in China around the ninth century. The process was primarily used for the creation and reproduction of illustrations as well as written text, usually containing some religious context.

From China it spread westwards via the expansion of the Islamic world. During the 13th century, its use in Europe was limited to stamping of designs onto textiles, as the lack of production and supply of cheap paper posed a commercial impracticality. By the 15th century, the medium became established as a minor art primarily used for playing cards and religious illustrations of a crudely drawn nature.

In 1493 the first great illustrated book, Weltchronik, was published in Nuremberg by Anton Koberger, Albrecht Durer’s godfather, for whom Durer was an apprentice for, contributing to the book. The success of the book prompted publishers to realize there was a market for implementing woodcuts into books that was both cheaper and easier than engraving the production of illustrations. In the next few years, Durer legitimized the woodcut as a sophisticated form of art on its own with his brilliant woodcuts including “Apocalypse” 1499 and the “Great Passion” and “Life of the Virgin” 1511. Durer’s example was decisive, and the first thirty years of the sixteenth century saw the greatest efflorescence in the history of the woodcut, both in single sheet designs and in book illustrations. The most important aspect of the historical context of woodcut is that it was truly the first vehicle for the sharing of ideas in both the form of text and image.
Process Description

Traditionally the material used is wooden block about an inch thick. The wood is taken from the plank of a fairly soft wood tree such as: pear, sycamore, or beech.\textsuperscript{126} The artist’s design is either drawn directly onto the block or onto a piece of paper that is then glued to the surface. The “cutter” uses a knife similar to a penknife to carefully cut away wood from the sides of the lines the artist has drawn.\textsuperscript{127} Chisels and gouges are then used to remove large unwanted areas between the line work.\textsuperscript{128} When finished the image will appear as network of lines standing out in relief from the carved areas.\textsuperscript{129}

Next the artist must prepare to print and follow a series of steps: The first step before printing is to tear enough paper to size. The second step is to set up a system for printing registration; many artists have different ways of doing this, the most common is the use of registration pins onto a gridded printing bed; this is especially important and you are layering multiple blocks.

Steps:

1. Set pressure of the press with block and layered blankets.
   a. Blanket order from bottom to top is: size catcher, embosser, and pusher.
   b. Initially set press roller at a height so that roller has just enough pressure to roll block through; tighten by small increments until proper pressure is achieved.

2. Apply ink onto block with a roller.
   a. Remove ink from ink can in circular motion, removing only a thin layer at a time; place ink onto glass slab.
   b. Spray open ink can with vegetable oil, place wax paper over ink, reseal ink can.
   c. Add a few drops of dryer, usually a heavy metal liquid, to the ink on slab. Mix well.
   d. Spread ink with ink knife is a gridded pattern on glass slab in thin strips.
   e. Roll ink with roller in many directions until ink is evenly spread into a mass on the slab; ink will begin to glisten and have “furry” texture when roller is fully coated.
   f. Slowly roll the roller over the block to apply ink to raised areas.
   g. Repeat steps d and e until block is fully coated with ink.

3. Printing.
   a. Place block back on press.
   b. Carefully place paper on block.
   c. Place newsprint and blankets over block.
   d. Crank through press.
   e. Carefully remove blankets and newsprint; slowly pull paper from block.
   f. Hang pulled print on clips attached to hanger line.
   g. Repeat steps 2-3 for desired number of prints in the edition.

4. Clean up.
It started with a very simple form, that over the series of five equally sized blocks become more fragmented while implying a sense of forced perspective. The pattern and fragmentation are informed from abstracted classical stereotomic forms of coffered cathedral domes; one place that relief and architecture are connected through material expression. The purpose is to demonstrate the field ground relationship that is created by carving a wood block, while exploring the expressive nature of the abstracted forms. The act of carving removes material from the block, which in turn reveals the desired image; this can essentially be thought of as drawing in reverse. The field, represented by the black (positive), of the block is that which remains untouched from the carving process; While the ground, represented by the white (negative) areas, is where material is removed. The revealing of form, or space, through subtractive means is a theme that is recursive throughout these processes.

Carving notes:

**Block 1:**
Blank block

**Block 2:**
This block is carved more deeply from the center so that the ink that is rolled on does not mark the peaks of the carve marks when being printed. This becomes less of an issue in the other blocks since each subsequent block has more un-carved material.
**Block 3:**
Addition of implied perspective lines that reveal a form inside the carved void.

**Block 4:**
Emphasis on the edges of the perspective lines with the addition of cardinally symmetrical vertical and horizontal divisions.

**Block 5:**
Fragmentation of the zones contained in each region bounded by the perspective lines, implication of voids forms through perception of line thickness.

**Block 6:**
Additional fragmentation creates perception of solid mass with voids now appearing solid.

---

**4 Printing:**

Before inking the blocks, embossments are made by running them through the press at an increased pressure setting. Following the embossments, the blocks are inked to produce the final print. (see: process description for details on process sequence)
Simultaneous to the production of the prints, the medium of bronze casting is also being investigated as a possible analogous process to woodcut that yielded a three-dimensional object rather than a two dimensional print. The connection between the two mediums resides in the operation of creating a matrix, specifically a negative from a mass, to ultimately yield an object (print, sculpture).

The lost wax technique is the process of choice. This starts with working the wax by hand; initially creating 2D carved forms in the same manner as the woodcuts. The 2D carved forms are then folded onto themselves to create a three-dimensional object. This wax form is then placed into a formwork and covered with a mixture known as “investment” that hardeneds, producing a solid mold. The wax on the inside of the mold is then melted out and replaced with molten liquid bronze; form #1 is the result.

Pushing this idea even further, two of the final woodcut designs are lasercut out of plexi-glass and used in exactly the same way as the first wax form. This is an experiment in the transition of form from two dimensions to three dimensions through the method of folding the form onto itself in all directions; form #3 is one of the acrylic replacements for the wax, form #4 is the bronze form result.
The inked prints and the blocks share the same figure ground relationship; the raised areas of the block are black/"positive" while the recessed areas are white/"negative".

Interestingly when looking at the embossed prints this relationship changes. Without the relative perception of the figure ground created through the use of ink, only the impression of the block remains. This impression is the inverse of the wood block, now showing protrusions that look similar to extruded structure in places where the block shows negative carved areas. The negative spaces of the block yield a positive type of “structure” that looks architectural in nature and completely disassociated from the classical stereotomic forms that initially inspired their creation.

The casting relates directly to the expression of the embossments. The embossment is created when the high pressure of the press forces the paper into the voids, raising them away from the positive field of the block. The bronze casted form expresses a similar relationship; the molten bronze when poured fills the void left by the absence of the wax form, creating a similar representation of structure as the embossment in three-dimensions.
Historical Influence

Etching was invented as a method of decorating armor prior to the fourteenth century. This sort of decoration involves painting the design in resist and then etching away the background in order to leave the design standing out in relief. Printing an etching, as it is currently done, did not occur until some seventy years after the invention of printing from engraved plates. The earliest etching dates to 1513, of which only an impression of Urs Graf’s original etching exists. An important distinction between engravings and etchings is the fact that engraving is a physical manipulation to the plate, whereas the depth of mark in etching is created through a chemical reaction. It has been customary in history to deplore the fact that later engraving, in comparison with fifteenth-century work, was so largely reproductive rather than “original”; however the entire history of western art may have been quite different if engravings had not rapidly disseminated every stylistic innovation across Europe. In the Netherlands Lucas van Leyden, Dirk Vellert, and others use etching merely as a less laborious method of achieving the effect of engraving; when, as sometimes happens, the two techniques are combined on the one plate, they can be very hard to distinguish. Following their lead, artist and book producers began increased proliferation of etching in comparison to engraving as means of rapid production of imagery.
Process Description

The essential principle of etching is that the metal of the plate is removed by eating into it with acid rather than by cutting it out with a tool as in engraving. To successfully accomplish this, there are series of steps that must be followed. Line etching, specifically, is the first process in a list of sequential etching processes that must be completed before moving on; as the name implies, it is the process of etching lines into a metal plate using acid. This can occur on a variety of metals, such as iron, steel, zinc, and most commonly copper. The metal plate is shaped, cleaned, and given a ground; an application of asphaltum, beeswax, rosin, and lithotene. This ground serves as the resist that the artist then scribes an image or text into, it is important to remember that what ever is scribed onto the plate surface will ultimately appear mirrored in the final print. The plate is then immersed in acid, which eats away at the exposed scribe marks made through the ground. The artist must then remove the ground from the plate in order to apply ink into the etched grooves of the plate. Through the pressure of the press the paper is forced against the plate and into the grooves to receive the ink transferring the image.

Steps:
1. De-grease and polish the plate
   a. Use comet to degrease the plate
   b. Use steel wool to polish the plate
2. Apply hard ground to plate
   a. apply with foam brush
   b. allow 30-60 mins to dry
3. Transfer/Scribe image onto plate
   a. Trace image onto plate with iron oxide paper
   b. Scribe image into hard ground w/variet of mark making
4. Etch plate in acid bath
   a. etch in timed increments for a range of line weights
      Delicate <3 mins
      Medium-Delicate 5-7 mins
      Medium 7-10 min
      Medium-Heavy 20-30 min
      Heavy lines 30-60 min
      Heavy, Bold lines 60-80 min
   b. apply stop-out to cover completed areas between increments
5. Clean Plate
6. Tear & prepare paper
   a. paper must be soaked or dampened prior to printing
7. Set pressure on press
8. Mix ink w/easywipe
9. Ink plate
   a. using a mat board or plastic card, spread an even thin layer of ink across the plate.
   b. use a tarlatan (starched cheesecloth) to rub ink into plate
   c. use second tarlatin to rub ink in while removing excess ink
   d. use news print or phone book pages to remove ink from surface
   e. buff surface, clean edges, clean back of plate
   f. place plate on the press bed
10. Print
    a. layer blankets: size catcher, embosser, pusher
    b. run through press, repeat from step 9
11. Clean up
3

**Line Etching**

The plate expressing the process of line-etch is in and of itself creates an analysis of the process. Inspired by the “analytique” format of the Beaux-Arts style composite drawing, the analysis is an arrangement of three plates, each a different size and each containing a different expression of the tectonic interaction between acid and plate at a macro-scale. Both the soft ground and aquatint prints follow the same format. The content of the plates is as follows:

**Plate 1:**
The raw expression of the technique as it is used in many works of art. The form is that of a series of rotating triangles moving through space. The content represents a simple geometric form expressed, through line, in a complicated proportional pattern.

**Plate 2:**
A graphic depiction of the relationship between duration of exposure and depth/weight of mark. Listed are the time increments used in the etching process; paired with macro-graphic representation of the resulting plate form.

**Plate 3:**
A macro perspective view of the resulting form of the plate post etching process. The articulation of the valleys references plate 2.
Of all the etching processes, line etch is possibly the most important. It is the simplest means by which the content of the image is defined in terms of contour and outline. Each line becomes a permanent mark that can define, contain, or separate the element within the image. What is learned from this print is the architectonic nature of the acid’s ability to create valleys in the plate. At a macro-scale these alterations to the plate are quite pronounced, and the relationship between time and depth is emphasized. At this scale the other zones of the plate/image are literally separated by valleys where material has been removed. It is the missing material that defines the content.
Soft ground is a technique invented in 1758 by J. C. Francois as a result of a series of experiments. This technique was popular at the end of the 18th century in England, where it was widely used for making facsimiles of drawings. In the twentieth century, there has been a revival of interest in the technique, once it was realized that material of any texture could be pressed into the ground and the pattern transferred to the copper plate.
2 Process Description

Soft ground refers to the resistive ground, similar to the hard ground in line etching, which is placed onto a plate. Soft ground gets its name for being softer than the hard ground. Both grounds are made of the same elements but of a slightly different ratio; this allows for the soft ground to absorb the details of materials or marks that are pressed into it. The impression is then left on the plate and etched into the plate in a similar way to how line etch works. This technique is advantageous because it allows artists to incorporate found textures into their work or to create facsimiles of drawings. This technique most typically occurs immediately after line etch.

**Steps:**

2. Apply soft ground to plate
   a. apply with foam brush
   b. allow 30-60 mins to dry

3. Apply found material
   a. place found material on soft ground, cover with wax paper
   b. run plate through press
   c. gently remove wax paper and material

4. Etch plate in acid bath
   a. etch in timed increments for a range of impression depth
      - Delicate <3 mins
      - Medium-Delicate 5-7 mins
      - Medium 7-10 min
      - Medium-Heavy 20-30 min
      - Heavy lines 30-60 min
      - Heavy, Bold lines 60-80 min
   b. apply stop-out to cover completed areas between increments

5. Clean Plate

6. Tear & prepare paper (see line etching for details)

7. Set pressure on press

8. Mix ink w/‘easywipe’

9. Ink plate (see line etching for details)

10. Print (see line etching for details)

11. Clean up
3

Soft Ground

The soft ground print incorporates a found material as the primary content to express the nature of the process. The etched impression on the plate can be step etched in a similar fashion as line etching, using stop out. This process resulted in the creating of two plates and the presentation of the found material.

Plate 1:
The raw material expressing the use of the technique, two copper mesh patches were layered in the impression onto the plate. The copper mesh is a material with a structural system reminiscent of an architectural diagrid, the layering of these systems creates interesting intersections.

Plate 2:
Where a plate should be is rather the found material itself, expressing the original that has affected plate 1.

Plate 3:
A macro perspective view mid impression of found material to soft ground of the plate.
Soft ground is the primary method by which information is duplicated or transferred in the etching process. It is suitable to be used as a collage tool or to provide an area bounded by line etch with a found texture. The found texture from this process yields in the macro scale an inverse to the post-etch plate. What this produces is a lock and key arrangement of plate to found object, allowing the possibility to use the found material as the replacement of the etched copper to make the plate whole again.
Aquatint is a process that existed in obscurity between the 16th -18th centuries as a tightly held secret amongst individual artists not willing to publish or share the means by which they achieved various tonal effects. This resulted in many variations of methods and was not properly mastered until the work of Francisco Goya. Goya usually laid his aquatint over an etched foundation, often combining it with the use of acid washes and the burnishing tool. This technique was ideal at a period when most watercolors were executed simply in transparent washes over a pen outline, particularly since the aquatints could easily be hand-colored after printing to complete the effect. It was, therefore, the technique pre-eminently employed for illustrating the great series of color-plate books, which enjoyed a remarkable vogue in Britain between about 1790 and 1830.
Process Description

Aquatint has the ability to mimic the effect of a watercolor wash. The key is a special variety of etching ground, which consists of particles of resin which are fused to the plate and act as a resist to the acid. Since the ground is porous, the acid bites into the plate in tiny pools around each particle. The etched portions of the plate will then retain ink after the plate has been wiped. The fineness of the particles can be controlled in a gradient allowing for a full tonal range to be achieved. This technique is typically the last etching process used before printing the plate.

Steps:
1. Clean plate with alcohol
2. Apply aquatint to plate
   a. use a lacquer spray paint (metallic gold works best)
   b. place plate flat on the ground, mist plate at a distance
   c. rotate the plate 90 degrees and repeat up to six times
   d. coat until 50% is evenly covered with spray particles
3. Stop-out areas you wish to remain without tone
4. Etch plate in acid bath
   a. etch in timed increments for tonal range (always test)
      Delicate   <3 mins
      Medium-Delicate  5-7 mins
      Medium        7-10 min
      Medium-Heavy  20-30 min
      Heavy lines  30-60 min
      Heavy, Bold lines  60-80 min
   b. apply stop-out to cover completed areas between increments
5. Clean Plate
6. Tear & prepare paper (see line etching for details)
7. Set pressure on press
8. Mix ink w/‘easywipe’
9. Ink plate (see line etching for details)
10. Print (see line etching for details)
11. Edit tones with scraper and burnisher
12. Repeat steps 9-10
13. Repeat step 11, 9, 10 until desired affect is achieved
14. Clean up
Aquatint

The key to this technique of aquatint incorporates the use of metallic spray paint, or lacquer spray paint. Both provide a strong and consistent ground for the creation of tonal aquatint gradients. The step etching of tonal zones allows for value control.

**Plate 1:**
The raw material expressing the use of the technique shows a variety of tonal range as well as particle size, achieved through step etching from the outside in.

**Plate 2:**
A graphic depiction of the relationship between duration of exposure and depth/tone of etch. These values can be manipulated and worked through the subtractive process of scraping and burnishing.

**Plate 3:**
A macro perspective view of the resulting surface of the plate after the etching of the aquatint. The spires are formed via the resist particles.
4
Analysis

The porous nature of the etched area around the resist forms a unique structure on the plate. The macro-scale plate expresses this structure with the depiction of thousands of tiny columns, each preserved by the resin at their peak. The longer the exposure time, the taller and thinner the spires become, creating more fill space for the ink. This understanding of form and depth in relation to time and resist is similar to the line etch methodology, however this process deals in tonal shifts.
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<td><strong>Edge</strong></td>
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<td><strong>Screen</strong></td>
<td><strong>Gradient</strong></td>
<td><strong>Visibility</strong></td>
<td><strong>Pressure</strong></td>
<td><strong>Expansion</strong></td>
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<td><strong>Border</strong></td>
<td><strong>Wall</strong></td>
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<td><strong>Materiality</strong></td>
<td><strong>Tonal Range</strong></td>
<td><strong>Light</strong></td>
<td><strong>Layering</strong></td>
<td><strong>Compression</strong></td>
</tr>
<tr>
<td><strong>Hatch</strong></td>
<td><strong>Reveal</strong></td>
<td><strong>Pattern</strong></td>
<td><strong>Perforation</strong></td>
<td><strong>Resist</strong></td>
<td><strong>Screen</strong></td>
<td><strong>Order</strong></td>
<td><strong>Grid</strong></td>
</tr>
<tr>
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<td><strong>Mullion</strong></td>
<td><strong>Texture</strong></td>
<td><strong>Porosity</strong></td>
<td><strong>Particle</strong></td>
<td><strong>Transparency</strong></td>
<td><strong>Registration</strong></td>
<td><strong>Threshold</strong></td>
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<td><strong>Step-bite</strong></td>
<td><strong>Beam</strong></td>
<td><strong>Layer</strong></td>
<td><strong>Canopy</strong></td>
<td><strong>Step-bite</strong></td>
<td><strong>Density</strong></td>
<td><strong>Transfer</strong></td>
<td><strong>Plane</strong></td>
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<td><strong>Offset</strong></td>
<td><strong>System</strong></td>
<td><strong>Coverage</strong></td>
<td><strong>Dimension</strong></td>
<td><strong>Ink</strong></td>
<td><strong>Termination</strong></td>
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<td><strong>Arch</strong></td>
<td><strong>Fill</strong></td>
<td><strong>Web</strong></td>
<td><strong>Resist</strong></td>
<td><strong>Definition</strong></td>
<td><strong>Proof</strong></td>
<td><strong>Symmetry</strong></td>
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<tr>
<td><strong>Stop-out</strong></td>
<td><strong>Spaceframe</strong></td>
<td><strong>Soft ground</strong></td>
<td><strong>Truss</strong></td>
<td><strong>Pourous</strong></td>
<td><strong>Column</strong></td>
<td><strong>Water</strong></td>
<td><strong>Hierarchy</strong></td>
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<td><strong>Fill</strong></td>
<td><strong>Deconstruction</strong></td>
<td><strong>Repetition</strong></td>
<td><strong>Sequence</strong></td>
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<tr>
<td><strong>Resist</strong></td>
<td><strong>Tunnel</strong></td>
<td><strong>Transfer</strong></td>
<td><strong>Peel</strong></td>
<td><strong>Scrape</strong></td>
<td><strong>Surface</strong></td>
<td><strong>Mirror</strong></td>
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<tr>
<td><strong>Acid</strong></td>
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The adoption and proliferation of digital computers and record keeping marked the first digital revolution in the twentieth century. The Second revolution occurred in 2075 and marked the integration of the human experience with the digital realm. Advancements in bio-nanotechnology have produced neural implants which expand human capacity for thought and perception. Individuals connect without wires or batteries directly to the infinite data-verse.

Google incorporated was at the forefront of research and development to this neural technology. Consumers across the globe embraced this new frontier for digital immersion. With exclusive rights to the patents, and the business infrastructure already in place for rapid international distribution, Google transformed from billion-dollar company into an unprecedented global force of power and influence. Google searches and digital transactions are no longer constrained by physical technology, connections are proliferated via a network that allows the mental sharing of thoughts, images, and information. Books and knowledge are no longer read or communicated via tangible means, but are instead understood directly through neural input.

Analog has been lost. The world has been digitized. All printed material is considered obsolete and has nearly ceased to exist. Libraries have been abandoned to make room for immense server farms. Galleries no longer house physical art, but rather have become shells for neurally engineered experiences. The production of printed or analog material is a concept that current generations have trouble even comprehending. Recognizing the impact of this loss, Google has commissioned a monument to the printed image.
The site is a large empty swath of land located in San Jose, California; north of the Googleplex. Primarily used for walking and exercise, the empty lot is only utilized during events, such as concerts, for parking. Google has donated the land and turned it into a public park in an effort to commemorate the importance of the printed image as a symbol of shared knowledge and growth of the human condition.
3
Program

The program of the memorial is based off the sequential processes of the etching process regarding the printing of an image. This is broken down into the major sub-processes of etching and terminates in a spatial translation of the printing process. The four sequences are: line etch, soft ground, aquatint, and printing. Upon completing the sequence the visitor will have an alternate path to return to the start of the monument. The return path, like the four initial sequences, correlates and represents additional subtleties of each process from a different point of view, relating to post-process edits and voyeuristic views into another artist’s work, much like viewing an actual print.

Sequence 1:
Structural Frame / Line Etch

Sequence 2:
Surface + Texture / Soft Ground

Sequence 3:
Density + Light / Aquatint

Sequence 4:
Expansion + Compression / Printing
TOP Monument section concept (etching)

BOTTOM Monument plan concept (etching)
The Design

Each sequence of the design expresses an architectonic translation of technical steps in a symbolic and representational expression of architectural form, correlating to the nature of both the architectural element and etching technique. The procession of the monument carves through the site from southeast to northwest. The expanding and contracting quality of the length of the monument relates both to the duration of time and impact each process has while also referencing the sectional quality of a typical mark made in a woodcut. The spacing of each sequence and level of expansion and contraction are specific to each sub-process. As a whole the monument reads as a series of experiences imbedded into a single carved path forming a canyon through which the visitor must transverse.

Sequence 1:
The architectonics of the line etching process is expressed through the manifestation of a space frame. The form of the space frame is derived from the concept of the line, forming the boundaries and structure of an image. The articulation of the structure is based on the method of mark-making used in this process; hatching & cross-hatching. The plane at which those marks are made are duplicate in the x, y, and z to bring the form into three-dimensions. The thickness and height of the frame correlates to the proportional relationship of recession of the ground plane, just as the etching plate and paper print would interact.

Sequence 2:
The process of the soft ground technique incorporates a found texture and impresses itself upon the plate allowing for replication of form. This aspect is implemented in the form of structural diagrid canopy that has
begun to remove itself from the floor plane in a gentle peeling motion. The canopy terminates into the floor merging into one continuous surface that is no longer entirely floor or ceiling. The nature of the process creates an inverse artifact of the original form. The diagrid canopy structure yields an extruded diamond pattern floor, which elevates the ground plane enough to allow the flow of water through the voids of its area.

**Sequence 3:**
The aquatint process concerns itself with relating to the principles of scale, proportion, light, and kinesthetic. The space is divided into zones related to the amount of time a plate is immersed in acid to yield a range of tonal values. The columns are symbolic of the dotted resist used in the process to protect a 50% coverage of the plate. The proportion and spacing of the columns is correlated to the dissolution of the resist, decreasing in diameter and having greater spacing the longer the exposure. The columns are also structural elements supporting and penetrating the roof allowing sunlight to wash down their height into the space. With this understanding the amount of sunlight entering the space begins to represent the range of tonal gradient.

**Sequence 4:**
The final sequence relates to the actual process of printing, embodying the characteristics of registration, preparatory process, expansion & compression, and reflection. The threshold consists of a recessed pond with large waling stones that indicates the beginning of the printing process. The water is a symbol of cleanliness needed throughout the process. The stones are spaced in such a way to require the patron to focus on their steps; the shape and proportional dimension of the stones are correlated to the pre-tearing and sizing of paper that must be soaked before printing.

The raised area and roof structure is symbolic of the press and the required layers used when placing a plate on the press. The spacing of the skylights and telescoping roof are a reference for the need of a registration
grid for precise placement of materials. The compressed area under the roof gives the patron an impending feeling of being crushed by the weight overhead, reinforcing the idea of pressure while traversing the space. Upon exiting the visitor is invited to return via a different route starting with the stairs leading into the roof structure from the outside.

5

Concluding Notes

A print is in essence a pictorial image which has been produced by a process which enables it to be multiplied, and therefore requires the previous design and manufacture of the printing surface. At a more sophisticated level it is sometimes held that a print is a secondary object as compared with a painting or, more particularly, a drawing: the print is simply a drawing which the artist made on wood or copper or stone in order to be able to turn out many copies of it. Therefore, it is held, a drawing on paper must be superior since it preserves the direct intention of the artist without the distorting filter of the reproductive process. This objection is groundless. Printmaking’s unique possibilities, arising from the interaction between printing ink, plate, and paper to produce aesthetic effects unrealizable in any other way. Thus the great prints of the world are not reproduced drawings but works of art deliberately created through the medium of printing.\textsuperscript{141}

Just as the entire mode of existence of human collectives changes over long historical periods, so too does their mode of perception.\textsuperscript{142} The way in which human perception is organized—the medium in which it occurs—is conditioned not only by nature but by history. The alignment of reality with the masses and of the masses with reality is a process of immeasurable importance for both thinking and perception.\textsuperscript{143}
The future, as an idea, can be thought of as a measurement of time from the viewpoint of current technology, to the development of a more advanced version. In the world’s present climate this measurement is exponentially becoming shorter with the development of each new technology. Machines, mechanical automation providing maximum efficiency and productivity towards a specific goal, are a direct result of how knowledge and technology can synthesize solutions. Machines can provide automation, the programmed assembly of other complex machines such as vehicles, televisions, and cell phones. The reality is that machines are becoming smarter, so smart in fact that it might not be long before they are capable of designing architecture far better than a human architect is capable of. Fortunately, design fields have not yet become an automated consumer business. However, design fields are integrating more smart technology into their process. Within the development of architecture, many firms rely on programs such as Revit, which allow the structure, material, and detailing of “architecture” to be selected, organized, and implemented from a library of choices with the click of a button. While this type of technology expedites the production process for a drawing set, it is also beginning to do something else. It is the first step in the cataloging of architectural expressions, controlling the means by which ideas are articulated and setting of boundaries towards all the possibilities that architecture might become. In essence the world of architecture is beginning the transition of handing over its license for creative thought and exploration. The computer must not become the designer and the architect must not simply become the overseer of a mapped and automated experience. This is not a new concept, only one that is becoming more believable the more technology grows.

The project outlined in this thesis focuses on the possibilities and variety that come from architecture when it is informed by the arts, specifically the process of making art. The importance of process, as seen in etching, is derived from the generation of a unique aesthetic and unpredictable physical product that is a direct result of the semi-controllable nature of the reaction between plate and acid. The breakdown of the etching process provides the basis for a translation that amplifies the nature of the acid as a catalyst for form. Architectural features are then injected with the tectonic and symbolic qualities of the form becoming a new catalyst, expanding the implicit meaning and explicit expression of the architecture.

This thesis uses printmaking as a vehicle through which the relationship between the ‘nature of art’ and architecture is expressed. While architecture is a service and will likely remain so, the rise of automation threatens to create a static paradigm driven only by cost and efficiency. As technology expands, architects must find ways to reinsert the nature of art into their designs, that is to say the means and the catalysts by which artists react and produce work. The proliferation of such an architecture could work harmoniously with the development of new technologies to create a limitless variety of spatial expressions embedded with meaning via art, culture, and history.
End Notes

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5. Ibid, 256.
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