A PRESENTATIONAL THEORY OF ORNAMENT

by

Daniel Richard Konstanty Maj,
Bachelor of Environmental Design, Dalhousie University, 2015
Bachelor of Honours Fine Arts, University of Waterloo, 2013

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ABSTRACT

Although ornament is typically understood to be a system of communication that operates representationally, this stance is problematic. While some ornament seems to represent disparate or even contradictory concepts, other ornament does not seem to represent anything at all. In both instances representation does not promote communication, it inhibits it. This thesis argues that while ornament may communicate representationally, its primary function is simply presentational. In this capacity ornament is used to communicate information regarding the qualities and relationships of material objects. The first half of the thesis engages with key texts and precedents in order to describe the mechanisms by which ornament is able to communicate. The second half of the thesis provides an example of how these mechanisms can inform the processes of architectural design. The thesis concludes with a reflection on the significance of ornamental communication and its role within the discipline of architecture. Ultimately, this thesis suggests that the practice of ornamentation not only helps us to define our world, but also to define our place within the world.

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REPRESENTATION AND PRESENTATION

This thesis is an investigation into the question “why ornament buildings?” The answer to this question is rooted in the understanding that the act of ornamentation begins when design extends beyond the strictly functional.¹ Similarly, “the significance of architecture lies in the distance between it and function.”² Indeed, it is exactly this distance which distinguishes architecture from the mere act of building.³ Architecture and ornamentation are therefore intimately connected in the manner in which they both exceed functional concerns. As such, an investigation into the nature of ornamentation is also an investigation into the nature of architecture. Although ornament appears to be supplementary, it may provide a profound insight into the foundations of architecture.⁴

Generally, ornament has been understood to be the means by which architecture communicates; it is designed by architects and executed by builders and craftsmen, but is ostensibly intended for the public.⁵ And, generally, this communication has been understood to be representational in nature, and largely symbolic.⁶ This position is perhaps most clearly expressed in Venturi et al’s formulation of the complementary definitions of the duck and the decorated shed: the former is a symbol, the latter is covered in symbols.⁷ In the case of the decorated shed representations of images from outside of the discipline of architecture are used to communicate information regarding the nature of the building. Likewise, many ducks are also overtly representational.⁸ In some instances these representations may convey information regarding the program of the building, or the status of its patron.⁹ In other instances they might respond to the physical or cultural context in which the building is situated.¹⁰ Or they may convey literary, ecclesiastical, or national symbolism.¹¹ This understanding is so prevalent that Levit claims that ornament is “axiomatically symbolic,”¹² regardless of whether architects acknowledge it or not.¹³

“Whatever the material limits, whatever the functional goals, symbolic motivations are formative and read into matter shaped by men. Ornament can never be reduced to a question of function and is incompatible as a category with that which simply functions or is the product of the technical logic of construction or craftsmanship.”¹⁴

According to Venturi, to the extent that an element depends on symbolic representations to express meaning, it communicates denotatively. Conversely, to the extent that an element depends on its formal qualities to express meaning, it communicates connotatively.¹⁵ However, this account of the communicative abilities of ornament is problematic for a number of reasons. First of all, as Venturi is quick to point out, the denotative capacity of ornament was lost when Modernism rejected symbolism.¹⁶ To the extent that the discipline had relied on symbolic representations to communicate, this rejection effectively dismantled the means by which architecture had traditionally engaged with culture.¹⁷ In this sense, traditional ornamentation is equivalent to a dead language which is no longer legible. Due to the diversity of contemporary society, the prospect of recovering or recreating this level of denotative meaning is unlikely. In a multicultural and increasingly cosmopolitan world representational communication is harder to accomplish, as it is difficult to achieve consensus about what exactly an architectural element might denote.¹⁸ Furthermore, whatever symbols have been inherited remain dependent on a particular cultural moment and can not operate effectively in changing conditions.¹⁹ Even those symbols which have retained their meaning require sustained attention to transmit their content – an uncommon occurrence in the lay person.²⁰

The Modernist rejection of symbolism was accompanied by the promotion of expressionism, which emphasized the formal qualities of architectural elements themselves,²¹ without reference to previously known forms.²² However, this too is problematic. To continue the linguistic analogy, this is equivalent to speaking a language in which words carry no denotative meaning, but only operate connotatively. As a solely connotative device, ornament may now proliferate any

number of interpretations. These interpretations may or may not bear any relation to the nature of the building, and may even be mutually contradictory. This may be seen in Jencks' interpretative sketches of iconic buildings (fig. 1). According to Jencks, the continued relevance of these buildings depends on their ability to accommodate a plurality of meanings.²³ Although the proliferation of interpretation is not problematic in and of itself, it does call into question the validity of ornament as a system of communication. How can something be said to communicate effectively when the content of that communication is prone to change?

However, the most significant problem which arises from a representational understanding of ornament is not the manner in which it proliferates interpretations but rather the manner in which it resists interpretation altogether. There are many instances of both ducks and decorated sheds which do not seem intended to convey meaning symbolically or even representationally. This may be seen, for example, in the complex joinery used in the construction of the To-ji Lecture Hall, which was built around 760 in Kyoto Japan (fig. 2). It is quite evident that the wooden elements in this detail exceed strictly utilitarian concerns and achieve an ornamental effect in doing so. However it is also quite evident that they do not seem to represent anything. They do communicate in some capacity, but if they do not represent anything, how might we understand the nature of that communication?

These problems may be addressed by re-framing the nature of ornamental communication. Harries suggests that an architectural element denotes its primary function through a formal code tied to habits and expectations. In addition to this, the form of an element also connotes a number of secondary functions.²⁴ This is, in a sense, exactly the opposite of Venturi's position. From this perspective it is the physiognomic characteristics of an element which operate denotatively, not its status as a symbol. To the extent that an element does communicate representationally it does so connotatively. This shift is significant because it means that ornamental communication is not primarily representational in nature – it is simply presentational. Within a presentational framework ornamentation is first and

fig. 1 - Charles Jencks' interpretations of Notre Dame du Haut

foremost a material phenomenon, not a symbolic one, and its symbolic significance always derives from its physicality.²⁵ Furthermore, as a material phenomenon ornament need not reference external criteria in order to communicate. Indeed, any ornament which must explain itself, or be explained, has failed to present its own qualities.²⁶

The shift from representational to presentational communication has consequences for how we understand architectural meaning. Although meaning is generally understood to be symbolically and linguistically expressed, this is not the case within a presentational framework. Rather, ornament which operates presentationally conveys meaning which is fundamentally existential and embodied.²⁷ It is rooted in the immediacy of the human perception of architectural elements and space²⁸ and, to the extent that it conveys information regarding these material conditions, it operates in a manner which is pre-verbal and non-semiotic.²⁹ In a sense, it is no longer accurate to refer to this as meaning at all. From a presentational perspective what matters instead is what an ornament communicates about itself, as opposed to what it communicates about other things.^{30, 31}

From a presentational perspective the challenges associated with ornamental communication may be viewed in a new light. Although Modernism did deconstruct the symbolic language of ornamentation, it did not damage its denotative capabilities in doing so. While the representational significance of past ornamentation may be lost, its physicality and architectural relevance remain. In this sense the language of ornament is still very much alive. And, to the extent that this language may be understood through embodied experience, it has a kind of “universal legibility.”³² Where representational ornamentation is culturally and temporally constrained, presentational ornamentation is able to cross cultural and temporal boundaries. Similarly, where representational ornamentation requires sustained attention to communicate, presentational ornamentation is able to communicate immediately. Within a presentational framework ornament may still proliferate symbolic interpretations. However, this is not as problematic as it would

fig. 2 - Joinery of the To-Ji Lecture Hall

be in a representational framework as the content of these interpretations is now of secondary importance. More importantly, a presentational account of ornamentation is able to explain architectural conditions which resist interpretation. Thus, the elaborate construction of the To-ji Lecture Hall need not be understood as a symbol or a metaphor, but rather as an investigation into the nature of matter itself.

This thesis argues that although ornament may operate in a representational or symbolic capacity, this is not its primary function. Instead, ornament operates in a presentational capacity, by articulating materialistic relationships and conditions. The first half of this thesis describes the mechanisms by which ornament operates presentationally. The second half of this thesis explores how these mechanisms may be used to inform the processes of architectural design. The thesis concludes with a reflection of the significance of ornamental communication and its role within the discipline of architecture.

ORNAMENTAL ELEMENTS

Ornament articulates physical relationships between various kinds of objects across a range of scales. At a small scale ornament articulates the forces and qualities within an architectural element. At a somewhat larger scale, the scale of the room or the building for example, ornament articulates the relationships between architectural elements. At the largest scale ornament articulates relationships between buildings, temporally as well as spatially. Finally, across all scales, ornament articulates relationships between the built environment and people.

The concept of articulation is integral to a materialistic and relational understanding of ornament. Articulation has two meanings which capture two qualities of ornament. Articulation may denote the act of making something distinct in relation to other parts. It may also denote the act of expressing something clearly. Articulation therefore reflects both the physicality of ornament and its communicative potential. More importantly, it suggests that these qualities are not distinct from one another but are instead intimately connected.¹ As an object becomes physically articulated it becomes expressively articulate.^{2,3}

At the scale of the architectural element ornament articulates two interrelated qualities: the materiality of the element in question and the processes of its making. It also articulates two connected physical conditions: the structure of the element and its surface. Materiality may be considered an internal force, as it is an intrinsic quality. Making may be considered an external force, as it acts upon materiality. The forms of all elements are a result of these internal and external forces.⁴ While the materiality of an element influences the process of its making, that influence is only evident in the making itself.⁵ The process of making therefore articulates material qualities, and different processes of making articulate different material qualities.^{6,7}

If making is understood as the articulation of material qualities then structure may be understood as the articulation of making. The crucial difference

between making and structure is that making is a process of articulation, while structure is a product of that process. The structure of an architectural element articulates both its materiality and the processes of its making.⁸ In the same way that different processes of making articulate different material qualities, different structures articulate different processes of making. Likewise, in the same way that structure articulates these qualities, surface articulates the qualities of structure.² Furthermore, the surface of an element also articulates the processes of its making.¹⁰ As the surface and structure of an element become more articulated they become more articulate, which is to say that as they gain more physical definition they communicate more information about the materiality of an element and the processes of its making.¹¹ The form of an element emerges from the intersection of materiality and making.¹² While each of these qualities influence one another they may be thought of in a linear fashion. Materiality is articulated through making, making is articulated through structure, and structure is articulated through surface.

The surface of an architectural element may relate to its structure in two ways. In the first approach the surface is articulated after the structure, while in the second approach the surface is articulated simultaneously with the structure. The first approach, which corresponds to a more conventional understanding of ornamentation, has been referred to as weak ornamentation. The second approach, which is associated more with tectonics, has been referred to as strong ornamentation.¹³ However, because this terminology may be unclear, the two approaches will be referred to as extrinsic and intrinsic articulation respectively.

Extrinsic and intrinsic ornamentation articulate different relationships between the surface and the structure of an architectural element. Extrinsic articulations establish a binary relationship in which a primarily ornamental surface covers a primarily utilitarian structure. Within this relationship the ornamental surface operates as a *parergon* - an accessory to work - which articulates the functional structure beneath.^{14, 15} Intrinsic articulations on the other hand establish a relationship in which surface and structure are intertwined or coterminous. Within

fig. 3 - Carved mashrabiya

this relationship both structure and surface may be simultaneously utilitarian and ornamental.

By articulating different relationships between the surface and structure of an architectural element, extrinsic and intrinsic ornamentation also articulate different architectural qualities. An architectural element which is articulated through extrinsic ornamentation is a utilitarian structure with an ornamental surface. In this instance the ornamental surface typically articulates the functionality of the structure.^{16, 17} Paradoxically, the functionality of the architectural element may only be articulated through its supplementary, ornamental articulations.¹⁸ Similarly, the ornamental surface depends upon the functionality of the structure to provide architectural qualities to be articulated.¹⁹ The structure and the surface of the element enter into a cyclical relationality in which the structure provides qualities to be articulated even as the articulations of the surface alter how the structure is expressed and perceived.²⁰ Thus, while the surface and structure remain distinct they require one another to articulate and to be articulated.²¹

While extrinsic ornamentation tends to articulate the function of architectural elements, intrinsic ornamentation tends to articulate their materiality and the processes of their making. The surface of an architectural element which is ornamented intrinsically articulates the same qualities which the structure articulates.²² As the structure is articulated through the intersection of materials and processes of making the surface is also articulated through those same characteristics.²³ An architectural element which is articulated intrinsically is therefore ornamented in the process of its making.²⁴ Within this context, ornamental differences articulate different material qualities and processes of making, as well as different understandings of those qualities.²⁵

Both extrinsic and intrinsic ornamentation may be seen in the mashrabiya, a carved wooden screen found in Arabic architecture (fig. 3). The extrinsic ornamentation includes the elaborate scrollwork on the frame which surrounds the screened window, as well as the geometric carvings on the lower panels of

the screen itself. In these instances only the surface of the elements has been articulated in an ornamental fashion. The intrinsic ornamentation includes the carved panels on the remainder of the screen. This is somewhat counterintuitive as we perceive the entirety of the screen as a surface. However, when conceived of as individual elements within a larger element, many of the panels of the screen have unornamented surfaces. Instead, the very structure of the panels is ornamental. While this is particularly evident in the purely geometric panels it is true of the floral panels as well. Indeed, the floral panels have been articulated both intrinsically and extrinsically; the structure of the panel is ornamental, and the surface of that structure has also been ornamented.

The subtle changes in the scrollwork on the frame demonstrate the manner in which extrinsic ornamentation may begin to articulate utilitarian functions. The scrollwork shifts to articulate the centre of each horizontal element, as well as the bases of the vertical elements, and the corners of the entire frame. These shifts may be understood as an expression of internal forces; they articulate the ways in which these elements are doing work. Although they also articulate a particular understanding of the material of wood, and the way in which wood is worked, their relationship to the utility of the elements is evident. It should be noted that the shifting scrollwork also articulates the ways in which these elements relate to one another spatially. However, this will be discussed in the following section.

In contrast to the extrinsic ornamentation on the frame of the screen, the intrinsic articulation of the panels within the screen do not primarily articulate utility. Rather, they articulate an understanding of materiality and the processes of working. If each panel individually expresses a particular understanding of wood and how it may be made into architectural elements, then collectively they express a fuller understanding of materiality and making. The complex figuration of the panels articulates an investigation into the processes of sawing, sanding, carving, gauging, joining and mitering. These processes in turn articulate an investigation into the qualities of the wood itself; its density, grain, strength and workability. It should be

noted that the ornamentation of these panels, like the ornamentation of the frame, also articulates a spatial dimension. In many instances the centre of each panel is differentiated from the edge of the panel, which is likewise differentiated from the corner. This concept will also be discussed further in the following section.

The primary difference between extrinsic and intrinsic ornamentation is not the architectural qualities articulated by each, but rather their respective positions in the process of design. While extrinsic ornament articulates a design which is already functionally complete, intrinsic ornamentation operates within the process of design itself. Intrinsic ornamentation is therefore generative and reflexive. As the structure of an element is articulated so is its surface, and as the surface is articulated, so is its structure.²⁶ Elements which are intrinsically articulated are ornamented in their making in a process which moves from generality towards increasing specificity.^{27,28} Articulation in this sense does not simply denote the expressive capacity of architecture, it denotes the process by which it is made.²⁹

If the primary difference between extrinsic and intrinsic ornamentation is their place within the process of design then their primary similarity is the manner in which they relate surface to structure. Although the two approaches articulate different kinds of relationships between surface and structure, both extrinsic and intrinsic ornamentation articulate a connection between the two which is referred to as veiling or masking.³⁰ These terms reflect the idea that the surface of an element may articulate its structural qualities, even while it appears to be obscuring them.³¹ The ornamental connection between surficial articulations and structural qualities is corroborated by the words cosmetics and cosmos. The two terms share an etymological root in the Greek word kosmein, which denotes the act of adorning as well as the act of arranging.³² The common origin of these words suggest a connection between the notions of surficial ornamentation and structural order:³³

The veil covers, but does not cover up; it dresses but does not dress up. It is not a disguise but a revelation. Encrusted with its own material, the veil is not just a self-

fig. 4 - Beam from the Sanmon at Engaku-ji

shadowing but a self-adornment. Far from hiding the depth behind the surface, it allows us to feel the depth in the surface.³⁴

The capacity of surficial ornamentation to simultaneously reveal and conceal structural characteristics produces an ambiguity which invites investigation. Like ornament itself, ambiguity has generally been understood representationally. However, ornament may also produce a representational ambiguity in which the very physicality of an element resists categorization. Thus, a surface which has been ornamented extrinsically may articulate the utilitarian nature of the structure beneath while also questioning the very functions it articulates.³⁵ Similarly, by working with and against material properties intrinsic ornamentation may simultaneously reveal and conceal different aspects of those properties.³⁶ Furthermore, an ornamental surface which reveals and conceals different material properties necessarily reveals and conceals different processes of making.

The concept of veiling may be seen in this carved wooden beam from the Sanmon at Engaku-Ji in Kamakura, which was rebuilt in 1785 (fig. 4). Here, the extrinsic ornamentation of the surface of the beam simultaneously reveals and conceals aspects of its materiality. While the smooth, sanded top of the beam and its chamfered underside follow and accentuate the grain of the wood, the carved spiral of the cloud motif deliberately interrupts it. While one ornament reveals a material quality, the other suppresses it. Although each ornament individually articulates a particular understanding of wood, together they articulate a more complex and nuanced understanding. The two conditions do not simply articulate the materiality of the beam, they mutually articulate one another.

The extrinsic ornamentation of the surface of the beam also reveals and conceals processes of making. This may be most clearly seen at the complex intersection of geometries which marks the connection of the beam to its supporting column. While it is not difficult to imagine the manner in which the underside of the beam was chamfered, it is quite difficult to imagine the different processes which

fig. 5 - Interior of Bar Raval

were required to execute this ornamental condition. In the same way that the spiral motif articulates the materiality of the wood even while it works against it, this confluence of lines articulates the process by which the wood has been made into an element, even while it conceals those same processes. The result is a rich tension between material qualities of the beam and the manner in which those qualities are articulated.

Finally, the extrinsic ornamentation of the surface of the beam reveals and conceals the function of the beam. The carvings differentiate the top of the beam from the bottom, the centre of the beam from the edge, and the middle of the beam from the end. This process of differentiation articulates each part of the beam in relation to each other part of the beam, and articulates the entirety of the beam as a discrete architectural element in relation to the other elements around it. While this process of differentiation locates the beam in space, it also articulates the forces at work within the beam. By differentiating the top of the beam from the bottom, the ornament articulates the different forces of compression and tension within the beam. Similarly, by differentiating the middle of the beam from the end, the ornament articulates the different forces of bending and shear within the beam. It is perhaps in this capacity that the surficial ornamentation of the beam operates most successfully as a disguise and a revelation. The location of the ornamentation articulates the function of the beam even while the form of the ornamentation obscures it.

While intrinsic and extrinsic ornamentation represent different methods of articulation they are not in conflict with one another. Rather, they are complementary. Indeed, the distinction between the two approaches to ornament should not be overstated. The chronology of articulation in the processes of design and making can be difficult to determine. As such the relationship between the surface of an architectural element and its structure is not always obvious. Many elements are articulated both intrinsically and extrinsically, and their ornamentation articulates a range of architectural qualities and characteristics. This may be seen

in the wooden panels which clad the interior of Bar Raval in Toronto, which was designed by Partisans in 2015 (fig. 5). Here the sculptural structure of the panels may be considered intrinsic ornamentation, while the sinuous grooves which articulate their surfaces may be considered extrinsic ornamentation.

While the surficial ornamentation of the panels is, conceptually, a secondary process of articulation, in this instance the surface and the structure of the elements were articulated simultaneously, using the same process of making. Even so, the fact that some of the panels are grooved while others are not suggests that the grooves are, in some capacity, surplus. Although the panels may be analyzed in terms of intrinsic and extrinsic ornamentation, their articulation in the process of design is not so precise.

ORNAMENTAL RELATIONS BETWEEN ELEMENTS

At the scale of the building ornament articulates two more interrelated qualities: continuity and difference. Continuity and difference are articulated through figuration and the configurations of figures. In this sense continuity and difference are similar to materiality and making in that they are architectural qualities which are being articulated. Figures and configurations, on the other hand, are comparable to the structures and surfaces of elements in that they are means of articulation. In the same way that different structures and surfaces articulate different material qualities and processes of making, different figures and configurations of figures articulate different types of continuity and difference. However, this analogy should not be overstated as the relationship between the concepts do not correlate exactly. While materiality and making are qualities which exist in isolation within an element, continuity and difference exist largely in the relation between elements. Similarly, though the relationship between structure and surface is articulated within individual elements, the relationships articulated through figuration and configuration often occur between elements.

An ornamental figure denotes any articulation beyond functionality. Configuration denotes the arranging of figures. These concepts are mutually defining; there can be no figuration without configuration and no configuration without figuration. This means that an ornamental figure is never articulated in isolation, it is always articulated in relation to other figures. Although figuration will be used here to specifically denote ornamental figuration, it should be noted that figuration occurs in all architecture. Purely functional buildings may include a large number of figures in the service of utility. Furthermore, even buildings which are devoid of ornament are themselves figures within a landscape.¹

Although continuity and differentiation may seem like contradictory conditions, they depend on one another for their mutual realization.² Continuity is articulated through differentiation and differentiation is articulated through

continuity. Like figuration and configuration, the articulation of continuity and difference occurs in all architecture. However, the more figuration a building contains, the more it articulates these qualities. In other words, the articulation of continuity and difference depend on the expressive capacity of ornament.³

Continuity and difference between elements are articulated in two complementary ways. First, the figuration and configuration of architectural elements may articulate a continuity or difference of quality. As the materiality of elements or the processes of their making differ, they mutually define one another. Similarly, as the articulation of surface and structure differ between elements, they also inform one another. While shared features articulate a qualitative continuity, disparate features articulate a qualitative difference.⁴ In this manner, the qualities of architectural elements are not simply articulated in isolation, they are articulated through comparative relationships with one another. Furthermore, these comparative relationships are also capable of articulating qualities which isolated elements are simply not capable of articulating. Although this comparative articulation occurs between elements, it largely relies on the figuration of individual elements.

Ornamental figuration is most successful when it articulates qualitative continuity in addition to difference.⁵ Figures which articulate only difference do not invite comparison and therefore do not establish complex or informative relationships between elements. Likewise, figures which articulate only qualitative continuity also do not invite comparison. Rather, figures which articulate both continuity and difference across elements invite investigation into the qualities which generated those figures. This articulation of continuity and difference requires that the elements in question share some qualities and not others.⁶ Thus, elements of the same material which have been made in different ways articulate both a type of continuity and a type of difference. Likewise, elements of different materials which have been made in the same way also articulate both continuity and difference. The same is true of elements which have been made from the same material using the same processes of making but which have different structural

or surficial characteristics. This is also true of elements which are structurally and surficially similar although they are made of different materials which have been processed in different ways. Each of these instances articulates different kinds of qualitative continuity and difference. Through this form of qualitative comparison the figuration of architectural elements can articulate many aspects of a material, a process of making, a structure or a surface. While the articulation of a single element can reveal and conceal certain characteristics, the articulation of that element in relation to other elements can reveal and conceal exponentially more.

A particularly elegant articulation of continuity and difference may be seen in a detail from a well in Japan (fig 6). A wooden column has been connected to a stone base using a scarf joint. Although they are made of different materials and have likely been formed using different processes of making the structural and surficial figuration of the two elements is identical. Individually, each element articulates a particular understanding of materiality and making; together, they articulate a much more complex understanding. The continuity of the structural and surficial characteristics of the figures heightens both the continuity and the difference in the materiality of the elements and the processes of their making. The relationship between the elements conceals material qualities and processes of making to the same extent it reveals them. The result is rich ambiguity which invites investigation. How is wood like stone and how is it different? How is sawing like carving and how is it different? How is a column like the base which supports it, and how is it different?

The figuration and configuration of architectural elements may also articulate a continuity or difference of relationship or of space. As the relationships between elements differ, the configurations of those elements differ. Similarly, as spatial conditions differ the figures and configurations which articulate those changing conditions also differ. In contrast to comparative articulation this form of articulation relies less on the figuration of individual elements and more on the configuration of elements in relation to one another. Like figuration within an

fig. 6 - Scarf joint from a Japanese well

element, the configuration of elements in relation to one another is more expressive if it articulates both continuity and difference. A purely continuous space is not articulate because it has not been articulated.⁷

The configuration of elements occurs in all architecture and is not always ornamental. Generally, the relationships between elements have some basis in functionality. However the configuration of elements may become ornamental if it exceeds functional considerations. Configurations may become ornamental in two ways. In some instances the relationship between elements may be articulated through the introduction of mediating figures. These figures may be located within the elements themselves or may take the form of entirely new elements. Additionally, the very configuration of architectural elements may produce a new figure. In this way even un-ornamented elements may be used to generate ornamental figures.

Ornamental figures which mediate between elements are typically located within the thresholds or margins between those elements.⁸ However, ornamental figures may also mediate between elements by merely implying the thresholds between them. In either instance the expressive potential of mediating figures depends on the articulation of physical or spatial points of exchange.⁹ Because of this, ornamental figures rarely cover the entirety of an element.¹⁰ Paradoxically, the use of mediating figures indicates that the seemingly excessive act of ornamentation is most articulate when it is restrained.

The articulation of spatial continuity and difference through the use of mediating figures may be seen in the detailing of the cantilevered balconies on the Harold C. Bradley house in Madison, Wisconsin, designed by Louis Sullivan in 1909 (fig. 7). Here, the relationships between architectural elements are articulated through the addition of ornamental panels of wooden scrollwork. Although the figuration of the panels differs, their configuration in relation to other architectural elements remains relatively continuous. As a result, the scrollwork differentiates each spatial condition from the others, even as it articulates the similarities between the various conditions. Indeed, the scrollwork does not simply articulate spatial continuity,

fig. 7 - Balcony of the Harold C. Bradley House

it articulates a continuity of materiality and of making. The configuration of the mediating elements is continuous in part because the system of construction is continuous. Within this context the different figures of the scrollwork take on new meaning. In addition to articulating a particular spatial condition each ornamental panel also expresses a particular understanding of how wood might be made into architectural elements. Together, these mediating figures articulate a relationship between materiality, making, and space.

Ornamental figures may also emerge through the configuration of architectural elements, regardless of whether those elements possess any ornamental qualities or not. Through acts of configuration, each element is articulated in relation to the elements around it.¹¹ These relationships may influence the figuration of the elements involved as much as the materiality of those elements or the processes of their making.

The ornamental configuration of elements may be understood through two concepts: nesting and adjacency. Nesting denotes the articulation of architectural elements through figure ground relationships. The figures in question may be elements, parts of elements, or combinations of elements. In the process of nesting each ornamental figure is considered in terms of context. The figure articulates the context and the context articulates the figure in a relationship which is mutually defining.¹² In other words, the figure configures the figures around it and is simultaneously configured by them.¹³ If the figure nests another figure within it, it serves as a ground for that figure and is likewise configured by it.¹⁴ Each of these acts of figuration and configuration depend on one another for their realization. In their mutual dependency they articulate the continuity of space, even as they articulate its differentiation into discrete spaces.¹⁵

The ornamental nesting of figures may be seen in the canopy which covers the entrance to the Holy Trinity Orthodox Cathedral in Chicago, which was also designed by Louis Sullivan in 1903 (fig. 8). Here, the figure of the gilded wooden arch is articulated in part by the figures of the three carved mandorlas nested

fig. 8 - Entry canopy at the Holy Trinity Orthodox Cathedral

within it. The figures of the mandorlas are in turn articulated by the circles, tulips and whiplash curves nested within them. These figures are also articulated by the triangles, diamonds, and foils of negative space which surround them. Perhaps the finest detail in this series of figure ground relationships are the trefoils, which are distinct figures in and of themselves, but which also simultaneously articulate the figures of the circles, the tulips, and the whiplashes. The trefoils elegantly demonstrate the relationship between figuration and configuration, and the manner in which this relationship articulates spatial continuity as well as difference. Additional instances of ornamental nesting may be seen in the coffered soffit of the canopy, the pyramidal pendants that articulate its ends, and the panelled lintel of the door.

If nesting defines figures through their relation to the figures which contain them, adjacency defines figures in terms of their proximity and orientation to other figures around them. Put in different terms, nesting considers figures in terms of the scales above and below them, while adjacency considers figures in terms of their own scale. The configuration of adjacent figures in an ornamental fashion may be seen in the Bishop Edward King Chapel in Oxfordshire, designed by Niall McLaughlin in 2013 (fig. 9). The ceiling of the chapel is defined by a series of intersecting glulam ribs. While each of these ribs operates as a figure nested within a ground, their configuration as individual figures within that ground is not inherently ornamental. Furthermore, the ribs do not serve as a ground for nesting other figures. Instead, their ornamentality is achieved through their configuration in relation to other figures at their own scale, namely one another. Each rib is articulated in part by the rib which shares its base, in part by the rib which it intersects, in part by the corresponding rib on the opposite side of the room, and in part by the series of ribs in which it is included. While the individual ribs are not particularly ornamental, the pattern which results from these spatial relationships is highly ornamental. Furthermore, this pattern is able to express a subtle and complex understanding of continuity and difference. The similarity in the figuration of the ribs and the manner

fig. 9 - Sanctuary of the Bishop Edward King Chapel

in which they are configured in relation to one another articulates both qualitative and a spatial continuity. However, the different geometrical conditions in the ceiling also demonstrate that the ribs are not completely identical. Through subtle differences in figuration and configuration the ribs are able to articulate a series of discrete moments in space, even while they articulate the continuity between those moments.

Like extrinsic and intrinsic ornamentation, the distinction between ornamental nesting and adjacencies should not be overstated. All figures, ornamental or not, are nested within a ground, even if they do not nest other figures within themselves. Similarly, all figures have some spatial relation to the figures adjacent to them, even if that relationship is incidental. Although any figure may be discussed using either term, most figures lend themselves to one term rather than the other.

Like the articulation of individual elements, acts of figuration and configuration may occur at different points within the process of design. Mediating figures articulate elements which are in some capacity already structurally or functionally complete. In this sense they are not unlike extrinsic ornamentation. In contrast, the configuration of elements into ornamental figures articulates those elements as they are being designed and made. In this sense, ornamental configuration is similar to intrinsic ornamentation. Elements which are configured in relation to one another articulate each other in a process of increasing specificity.¹⁶ This process of continuous definition is both reflexive and generative.¹⁷

The articulation of qualitative continuity and difference through figural comparison is more complex than the articulation of spatial continuity and difference. The articulation of the qualities of any architectural element occur in parallel with the articulation of every other element. The intrinsic ornamentation of an element may occur before, after, or at the same time as the intrinsic ornamentation of another element. The same holds true for the extrinsic ornamentation of an element. The figuration of an element may therefore be informed by the figuration of any number of other elements and may inform the figuration of many more. In

fig. 10 - Dining room of the Robie House

this way, comparative figuration may also be reflexive and generative, though it is not always so.

The distinction between the figuration and configuration within elements and between elements should not be overstated. Nor should the distinction between comparative and spatial continuity and differentiation. The figuration of an element can quickly transition into the configuration of many elements and back again. Likewise, differences in the qualities of elements are partially the result of their spatial configuration, and differences in their relations to other elements are partially the result of their qualities. Like the articulation of individual elements, the articulation of elements in relation to one another is a continuous process which moves from generality towards specificity. Indeed, the process of differentiation can progress almost indefinitely as architectural elements become increasingly more articulated both individually and in relation to one another.¹⁸

Regardless of when they occur within the process of design, ornamental figures and configurations may be used to articulate continuity and differentiation where they do not actually occur. Or, to phrase it another way, ornamental figures may be used to actually generate continuity or difference where they would not otherwise occur. Like individual elements, the relationships between elements may conceal material qualities and processes of making as well as reveal them. They may also simultaneously reveal and conceal the functional qualities of elements. Furthermore, the configuration of elements may also reveal or conceal qualities about the relationships between those elements. These acts of simultaneously revealing and concealing architectural qualities or spatial conditions are similar to the concept of veiling. In this capacity figuration and configuration may articulate a level of ambiguity which does not simply operate within an architectural element but also operates between elements. Any quality or condition that may be articulated within an architectural element may be further articulated in the relations between elements.

The articulation of ambiguity through figuration and configuration may be seen in the dining room of the Robie House in Chicago, designed by Frank Lloyd

Wright in 1909 (fig. 10). The ceiling of the dining room is divided into a series of different spaces using wood trim. Although this practice is not uncommon, what makes this instance unusual is the manner in which the trim interacts with the bulkheads which run along either side of the ceiling. By continuing from the surface of the ceiling down the side of the bulkhead, the wood trim articulates an unexpected spatial continuity, even while it simultaneously emphasizes a spatial difference. In doing so, the trim not only articulates spatial continuity and difference, it also suggests qualitative continuity. By treating the two elements in the same manner, the trim articulates their shared qualities, namely their surficiality. At the same time however, the trim also works against that very surficiality by implying a volumetric form. By articulating these seemingly disparate qualities the trim generates a rich tension which invites consideration and interpretation.

ORNAMENTAL RELATIONS BETWEEN BUILDINGS

At the largest scale ornament articulates relationships between buildings. The relationships which ornament articulates between buildings are not unlike those which it articulates between elements within buildings. Like elements, buildings articulate continuity and difference. Like elements, buildings articulate these qualities and relationships through figuration and configuration. Finally, like elements, the continuity and difference between buildings may articulate material qualities, processes of making, or spatial conditions. However the relationships articulated between buildings differ in a critical way from those articulated within buildings. Within the context of a building architectural elements generally exist simultaneously. Therefore the relationships between elements are primarily physical in nature, not temporal. Buildings on the other hand relate to one another temporally as well as physically. This may be readily observed through the use of precedents in architectural design. Buildings and the elements they contain are not articulated in isolation, nor are they merely articulated in physical relation to one another, they are articulated in relation to a vast body of architectural work that extends backwards in time. The articulation of materiality, making, structure, and surface each occur in relation to past articulations of those same qualities and conditions. The same holds true for the use of figuration and configuration in the articulation of continuity and difference. It is through the articulation of these temporal relationships that architecture operates as a reflexive discipline.

The temporal relationships articulated through ornament may be described in terms of convention and invention.¹ To understand convention and invention it is necessary to reiterate the two meanings of articulation. Articulation denotes the act of making something distinct in relation to other parts as well as the act of expressing something clearly. An element which has been articulated is articulate – it expresses a particular understanding of material qualities. Considered in this way, ornamental conventions are not simply common methods of structural or

superficial figuration and configuration. Rather, ornamental conventions represent a continuity of understanding.² If an ornamental figure articulates certain material qualities, a variation of that figure may articulate slightly different qualities. Similarly, If an ornamental figure articulates a certain process of making, a variation of that figure may articulate a different process of making. The same is true for ornamental configurations; if an ornament articulates the relationship between two elements or figures then a variation of that ornament may articulate a different relationship.

An ornamental articulation does not simply express an understanding of a single quality of an element – it may express any number of qualities. Similarly, it does not articulate these qualities separately from one another. Instead, the ornamental figuration of the surface and structure of an element articulates an understanding of many of the qualities of that element, the manner in which those qualities relate to one another, and the manner in which they relate to the qualities of other elements. The scope and complexity of qualities and relationships which may be articulated through ornamentation is therefore very large. A conventionalized figure presents a continuous understanding of how all of these qualities relate to one another in a given condition. Furthermore, it allows these qualities and relationships to become legible through its repeated usage.^{3,4} In this way an ornamental convention represents collective historical knowledge,⁵ and its continued use represents the continued relevance of that knowledge. Conventions articulate the continuity of material qualities, processes of making, and spatial relationships,^{6,7} and allow buildings and elements throughout time to mutually define one another.⁸ Without conventions, communication would be impossible.^{9,10}

If ornamental conventions articulate particular understandings of material qualities, processes of making, or spatial conditions, then inventions articulate new understandings of these same qualities and conditions. However, the expressive potential of ornamental inventions depends on the continuity of conventions.¹¹ Conventions provide a basis for invention and serve as the standards by which ornamental inventions may be understood.¹²

Like qualitative continuity and difference more generally, inventions are more expressive if they articulate both continuity and difference. If an ornamental invention articulates a different material quality, it should articulate a continuity in the process of making. Similarly, if it articulates a different process of making, it should articulate a continuity of material properties. Again, if an ornamental figure articulates a different spatial relationship, it should articulate a continuity of materiality and making. Simply put, the differences expressed by ornamental inventions are more clearly articulated through contrast with the continuity of convention.¹³ While even the most radical inventions do maintain a dialogue with convention, inventions which deviate too far may undermine the continuity of experience and hamper communication.¹⁴ Although it is counterintuitive, successful inventions are not only based off of conventions but must also largely adhere to them in order to remain intelligible.¹⁵ Conventions do not hamper inventions - they fuel them.¹⁶

Convention and invention are mutually defining. While conventions provide the basis for invention, inventions also prompt the continued reexamination of conventions.¹⁷ Historical conventions allow contemporary architecture to articulate itself in relation to the past.¹⁸ At the same time, inventions also articulate the past in relation to the present by providing new insights into the conventions from which they deviate.¹⁹ This process is similar to the way in which elements within a building mutually articulate one another through comparative figuration. Buildings and the elements they contain mutually articulate one another in a continuous, reflexive process.²⁰ The ornamental articulation of a material quality or a process of making rearticulates other instances of that quality or process. It is through this process that architecture is able generate new insights into the physical world²¹ and cause us to re-examine how we engage with that world.²²

The concept of ornamental convention may be seen in the typological photographs of Bernd and Hilla Becher. One of their pieces, entitled Framework Houses, depicts a number of simple half-timbered houses (fig. 11). The individual

fig. 11 - Framework Houses

wooden elements which constitute the frames of these houses have not been ornamented structurally or surficially. However, while the figuration of these elements is largely utilitarian, their configuration is highly ornamental. The ornamentality of the configurations is not in conflict with their utilitarian functions. On the contrary, each ornamental configuration articulates a new understanding of the functions of the elements it contains. Furthermore, while the qualities of the elements certainly informed their configuration, it is also possible that the act of ornamental configuration informed the structure of the elements themselves, as well as the structure of the buildings which contain them. Each of the buildings photographed by the Bechers articulates a particular understanding of wooden elements: their material qualities, the manner in which they are made, and how they relate to one another. Together, they articulate an even richer understanding. Each configuration of elements provides further insight into each other configuration.

If the photographs of the Bechers reveal an ornamental convention, then the unbuilt Wildensbuch houses, conceived by Marazzi Reinhardt in 2018, represent an ornamental invention based on that convention (fig. 12). In their description of the proposed houses the architects explicitly reference farmhouses like those documented by the Bechers. Like conventional half-timbered houses, the elements of the Wildensbuch houses are not ornamented structurally or surficially. Furthermore, these elements have also been configured in an ornamental manner. However, the configuration of elements within the Wildensbuch houses is clearly different from the configurations of elements in conventional half-timbered houses. The absence of diagonals, for example, and the manner in which the elements are offset from one another are both immediately apparent. These differences in configuration articulate a different understanding of how wooden elements might relate to one another spatially. By extension they also articulate a different understanding of the materiality of these elements. The significance of these differences can only be appreciated against the back drop of convention.

In the same way that the Wildensbuch houses are articulated in relation

fig. 12 - Wildensbuch House

to conventional half-timbered houses, the houses photographed by the Bechers are re-articulated in relation to the project by Marazzi Reinhardt. The inventive configuration of elements in the Wildensbuch houses prompts a new understanding of the conventional configurations depicted in the photographs. Furthermore, in articulating difference, the Wildensbuch houses also articulate continuity. The similarity in the figuration of individual elements articulates a continuous understanding of the processes of making those elements. The Wildensbuch houses affirm convention even while they challenge it.

ORNAMENTAL RELATIONS TO THE BODY

Ornament does not simply articulate material conditions and relationships in the abstract. Instead, ornament is an inherently experiential phenomenon which articulates these conditions and relationships to people.¹ Indeed, articulation, as the act of stating something clearly, actually presupposes the existence of a subject. And to the extent that ornament operates on a materialistic level, it must be engaged with by the viewer in a materialistic fashion.² Put slightly differently, materiality implies an encounter with a material subject.³ The nature of our relationship with ornament is not primarily intellectual, verbal, semiotic, or metaphorical - it is embodied.^{4,5,6} These additional layers of meaning arise from an embodied condition and depend on that condition. Although this might seem to hinder communication, it is actually beneficial. While intellectual and linguistic frameworks may be culturally bound, the condition of being embodied is both universal and immediately comprehensible.⁷ Our bodies serve as the mechanism by which we measure, organize, and ultimately comprehend our world.^{8,9}

Our physicality is so intertwined with the physicality of our world that experience and tectonics are essentially coterminous.¹⁰ As a result, ornament not only articulates materialistic conditions, in doing so it also articulates an embodied relationship to those conditions. In addition to communicating information about the material world, our embodied experience of ornament also shapes how we understand ourselves as material entities in that world.¹¹ This relationship between the external world and the embodied subject is reciprocal and recursive; the more we articulate the world, the more we articulate our place within in.¹² Through this cyclical process both the world and the subject co-emerge.¹³

To the extent that ornament articulates qualitative and spatial information about the material world, our relationship to ornament may also be understood in these same terms. As a spatial phenomenon our relationship to ornament is primarily configurational. As we configure the world around us, we configure ourselves in relation to that world.¹⁴ Like ornament, we may therefore be described through a

complex network of nestings and adjacencies.¹⁵ These configurations allow us to orient ourselves in relation other things, to register our own presence in the world, and ultimately to locate ourselves.¹⁶ By experiencing these configurations at different distances as we move through the world, we are able to place ourselves within a broad range of scales.¹⁷ Furthermore, these configurations are not passive but active; they invite us into a diverse array of actions and interactions with the world.¹⁸

Through conventional acts of configuration ornament articulates what may be called the continuity of spatial experience. It is evident that the experience of our bodies is not limited to the present but may be recollected through time.¹⁹ It is through this bodily memory that we are able to understand the world and humanize it.²⁰ Within in this context, conventional acts of configuration articulate our shared experience of being embodied.²¹ To the extent that these conventions reflect our experience, they provide the basis for our continued engagement with the world.²² As material configurations become conventionalized, the manner in which we interact with those configurations also becomes conventionalized.²³ Furthermore, as these conventions become internalized, they also provide the basis for inventive configurations and our engagement with those configurations.²⁴

While conventional configurations provide the basis for our continued engagement with the world, inventive configurations provide the opportunity to craft an identity in relation to that world. Through inventive acts of configuration ornament articulates the difference of place within the continuity of space.²⁵ The differentiation of space into places provides us with existential footholds in the world²⁶ and allows us to dwell in what would otherwise be a uniform, alien landscape.^{27,28} Ornament elevates places above the anonymity of space,²⁹ and in doing so it protects us from being displaced.³⁰ “We, our identity and the physical world, are intimately and inseparably connected by the way we create space, and the way we exist in it.”³¹ As we settle in place, place settles in us.³²

While the ability of ornament to communicate spatially is more immediate, the ability for ornament to communicate qualitatively is more profound. As a

qualitative phenomenon our relation to ornament may be understood primarily in terms of figuration. As we create figures in the world, we articulate our own figures in relation to them. In the same way in which our experience of objects in space informs our understanding of ourselves as spatial entities, our experience of the materiality of an object informs our understanding of ourselves as material entities. The relationship between the materiality of our bodies and the materiality of the world is at its most intense in the act of making. The processes of making articulate as much about the materiality of the maker as they do about the materiality of the made.

Through conventional acts of figuration ornament is able to articulate what may be called the continuity of material experience. Like our experience of space, our embodied experience of materiality persists through time. While conventional acts of configuration present a shared understanding of space, conventional acts of figuration present a shared understanding of both our own materiality and the materiality of the external world. These conventional figures also provide the basis for our continued engagement with the world and allow us to comprehend figural inventions intuitively.

Like inventive configurations, inventive figures provide an opportunity to refigure our relationship to the world.³³ However, where acts of configuration explore how we exist in space, acts of figuration explore our own embodiment in relation to other things. Through inventive acts of figuration ornament articulates different ways of conceptualizing the nature of embodiment.³⁴ Each inventive figure provides a new context against which we may compare our own figure. Each investigation into the materiality of an element is also an investigation into our own materiality.³⁵ Similarly, each investigation into the process of making an element is also an investigation into how our bodies work.

A presentational theory and practice of ornament offers architects a powerful tool for communication. On one hand ornament may be used to articulate a shared understanding of the material world and what it means to be an embodied

person in that world. On the other hand ornament may also be used to question that very understanding and provide new insights into the nature of the world and ourselves. Ornament may be used to help us settle into place and frame an identity in the world. Or it may be used to unsettle us, and to reframe that identity.³⁶ In whatever capacity it operates ornament beckons us to consider both ourselves and the world we live in.³⁷ Within this context ornamentation, and by extension architecture, is the art of articulating our place in the world.³⁸ It is an investigation into what it means to be human.³⁹

AN ORNAMENTAL DESIGN METHODOLOGY

The theory of ornamentation outlined in the first part of this thesis is primarily descriptive in that it provides a conceptual framework for analyzing and discussing existing designs. This framework consists of a series of interconnected terms and definitions. Although these terms and definitions are useful as analytical tools, to the extent that they are descriptive they do not facilitate the process of design. In order to so they move from being primarily descriptive to being primarily prescriptive. The transition from a material theory of ornamentation to a material practice of ornamentation therefore depends on re-framing the terminology involved.

This may be accomplished by using the key terms as the basis for a series of inquiries into the nature of an architectural element. Thus, instead of describing the materiality of an existing element, we may inquire about the materiality of a potential element in the very process of its design. The other terms introduced in the first part of this thesis may be re-framed in a similar manner. Furthermore, these questions may be posed in conjunction, and may inform one another in the same way in which the terms themselves do. Instead of simply inquiring about the materiality of an element in isolation a designer may investigate multiple characteristics of an element in an ornamental fashion at once.

The resulting questions may be summarized as follows. What material is this element made of, and what are the processes by which it is made? How are the materiality of the element and the processes of its making articulated in its structure? How are they articulated on its surface? How is this element qualitatively continuous with – or different from – the elements around it? Similarly, how is a space continuous with – or different from – the spaces around it? How are qualitative and spatial continuity and difference articulated in the figuration and configuration of elements? Finally, how might an element be conventionally articulated, and how might it be articulated inventively?

Although this series of inquiries corresponds to the three scales outlined

in part one, ornamental design is by no means a linear or sequential process. An architectural element is not simply articulated in its totality before other elements are addressed. Rather, ornamental design, like design more generally, is an iterative and somewhat cyclical process which moves gradually from the general to the specific. Within this process architectural elements mutually articulate one another. Thus, the articulation of material qualities in one element may inform the articulation of material qualities in another element. The articulation of material qualities in the second element may then alter the articulation of the first element, or inform the articulation of a third element. This process of mutual articulation may occur many times between many different elements. Furthermore, this process is obviously not limited to the articulation of materiality – any of the qualities of an element may inform the qualities of another element. The articulation of a certain process of making in one element may inform the articulation of a different process of making in another element. Likewise, the configuration of elements in one space may inform the configuration of elements in another, and so on.

fig. 13 - Multi-Faith room at Ryerson University

DEFINING THE PROJECT

The initial step in defining the design project was determining a program that could serve as a suitable vehicle for the exploration of ornament as a non-representational or a-symbolic phenomenon. This process proved to be a challenge: although a given building may have ornamental qualities, there is no particular program which is inherently ornamental. A palace, for example might be richly ornamented, but it need not be. Similarly, there is no particular program which inherently precludes the use of ornament. A water treatment plant might be entirely unornamented, but it also need not be.

Ultimately, a multi-faith space was chosen as an ideal program for the investigation of a material practice of ornamentation. This program is well suited to this investigation because it accentuates the complex relationship between ornamentation and representation. Many multi-faith spaces are empty, white, often windowless rooms.¹ The design of these facilities is predicated on the correct notion that individuals should not be confronted by the symbolism of other traditions.² However, in their attempt to promote pluralism and universal accessibility these spaces tend to be architecturally featureless. They are not only devoid of explicitly representational iconography, they are devoid of any form of ornamentation altogether. Implicit in this aesthetic sensibility is the conflation of architectural articulation and representation. The removal of architectural articulation is premised on the idea that these acts of ornamentation communicate in the same manner in which a cross, a crescent moon, or a Star of David communicate. However, multi-faith spaces which are designed in this fashion are in some sense self-defeating. The more universal they attempt to be, the more placeless they become. Furthermore, as these spaces are stripped of architectural articulation they become increasingly incapable of differentiating sacred from profane space.³ A drywall room with an acoustic tile ceiling does not inspire the awe or mystery which are typically associated with places of worship.

fig. 14 - Multi-Faith Centre at the University of Toronto

This may be seen in the existing multi-faith room at Ryerson University (fig. 13). The space is architecturally nondescript; its grey carpet tile and fluorescent lighting recall commercial office interiors. Although the space does not contain any iconography which might be considered exclusionary, it also does contain any architectural features which might recommend it as a place of worship. The space is universal, but only because it is mundane.

However, although many multi-faith spaces are devoid of both symbolism and architectural ornamentation, there are some which do contain the latter without the former. These examples are significant because they demonstrate that ornamentation is not inherently representational. Rather, they emphasize the tectonic nature of ornament and its basis in the realities of construction. One such space is the Multi-Faith Centre for Spiritual Study and Practice at the University of Toronto, which was designed by Moriyama & Teshima Architects in 2007 (fig. 14). The primary space in the project is the main prayer hall, which is characterized by a backlit ceiling and feature wall made of translucent white onyx. As individual elements, the ornamentation of these stone panels is entirely intrinsic, it is achieved through the articulation of structure. The treatment of the panels collectively articulates a particular understanding of the material qualities of stone, and the manner in which it may be made into architectural elements. Simply put, the translucency of onyx is articulated by sawing it into thin sheets. The dimensions of each panel articulate the physical limits of the material when treated in this manner. While a similar ornamental effect might be achieved using different materials or different processes of making, these panels articulate an understanding which is highly material-specific.

While the figuration of the individual panels articulates qualitative continuity, their configuration in relation to one another articulates both spatial continuity and difference. The particularities of the stone notwithstanding, the panels are identical because their materiality and the processes of their making are identical. The loose grid pattern in which the panels are organized simultaneously articulates particular spaces while also articulating larger architectural elements, namely a ceiling and a

fig. 15 - Inter-Faith Centre at Northeastern University

wall. The ceiling and the wall which are made from the onyx panels are qualitatively continuous with one another and qualitatively different from the other elements within the multi-faith centre. Furthermore, they are also spatially continuous with one another and spatially different from the rest of the multi-faith centre. Through the specific treatment of material they articulate a space which is different from the spaces around it, which is to say they articulate a place.

A comparable example may be seen in the Inter-Faith Spiritual Centre at Northeastern University in Boston, designed by NADAAA in 1998 (fig. 15). Like the Multi-Faith Centre at the University of Toronto, the primary prayer hall in this project is defined by an ornamental ceiling. In this instance, however, the ceiling features three spiraling domes made from metal plates. These metal plates have been arranged into a series of uneven rhomboids and perforated. The rhomboids have then been configured adjacent to one another to generate the larger figures of the domes. Both the figuration and the configuration of the plates articulate their materiality. The unusual shape of the plates, their extreme thinness, and the manner in which they are perforated articulate a particular understanding of the ways in which metal may be made into architectural elements. The way in which these qualities inform the configuration of the panels in relation to one another further articulates this understanding.

Although the figuration of the plates is not identical, it is similar enough to articulate a continuity of materiality and making. The fact that the figuration of the plates is not reflected elsewhere in the project clearly articulates a difference of materiality and making. The configuration of the plates into three identical figures articulates a continuity of space. At the same time however, the figuration of the three spiraling domes articulates spatial difference. The domes articulate a further level of spatial difference as they may be used to control the lighting within the prayer hall. Like the onyx panels, they articulate the difference of place in the continuity of space.

The multi-faith spaces at the University of Toronto and Northeastern

University both employ ornamental elements without relying on representation or symbolism. Rather, in both projects ornamentation is used to articulate material and spatial continuity and difference. Although it they are asymbolic, these acts of ornamentation are used in the service of programmatic considerations. By articulating different places in the continuity of space these projects are able to differentiate the sacred from the profane. By doing so tectonically, without representation, these spaces are also able to achieve a certain universality. In short, it is through the use of ornamentation that these spaces are able to fulfill their programmatic functions.

A multi-faith space is not only a suitable program because it brings the relationship between ornamentation and representation into high relief. It is also a suitable vehicle for the investigation of ornamentation because the programmatic requirements associated with such a space are neither numerous nor complex. This allows more attention to be placed on the process of ornamentation itself. The primary space in any multi-faith centre is the prayer hall. It is critical that this space be flexible.⁴ It must be large enough to accommodate sizable gatherings, but it must also be easily divisible to allow for more intimate occasions. In addition to accomodating groups of various sizes it must also accomdoate a variety of seating arrangements.⁵ The space must also have several focal points which afford different spatial orientations, most commonly towards the East or Mecca.⁶ The space must have direct access to storage spaces.⁷ While some of these storage spaces may be used for mundane objects such as tables, chairs, or rugs, others may be used to store sacred texts or artifacts.⁸ Some prayer halls have two entrances to accommodate traditions which maintain a separation of the sexes. However, in these instances it is important to ensure that although the distinction is clear to those for whom it is important, it does not affect the experience of those for whom it is not.

In addition to a sanctuary, a multi-faith space must also include a number of secondary service spaces. These include a space for divestment,⁹ spaces for ablutions,¹⁰ and washrooms. The divestment space is used for the removal and

storage of shoes, coats and bags before entering the sanctuary. The ablution spaces are used for ritual purification and include standardized stations for washing. The primary concern in the design of the service spaces is controlling access. While these spaces should be easily available to those who require them, they should also afford some privacy. Furthermore, they should not interfere with the experiences of those who do not require them.

In addition to fulfilling strictly programmatic requirements, a multifaith space must also take certain architectural considerations into account. To begin with, it should include a clear procession which incorporates a series of distinct thresholds.¹¹ This procession serves to differentiate the sacred from the profane,¹² and may be used to create an appropriate sense of awe, mystery, or reverence.¹³ A multi-faith space should also integrate the careful use of light, particularly natural light. Like a clear threshold, the considered treatment of light may be used to distinguish a space as a place of worship. Light is also significant because it is universal and as such it provides the basis for an experience which may be shared regardless of tradition or creed.¹⁴ This may be seen in both the Multi-Faith Centre at the University of Toronto and the Inter-Faith Center at Northeastern University. In these spaces light itself is handled as yet another material which may be figured and configured in an ornamental fashion. Finally, a multi-faith space should feature a natural material palette. Like light, materials such as wood and stone articulate a connection to the natural world which transcends cultural boundaries.¹⁵

From an architectural perspective, the existing multi-faith centre at Ryerson University is not a suitable space for prayer. It lacks the appropriate focal points which should recommend various spatial orientations. It lacks a clear series of thresholds to distinguish it as a space for worship. It lacks the careful treatment of light and materiality which would emphasize that distinction. It lacks integrated storage spaces and intentionally designed spaces for divestment and ablution. Perhaps most significantly, it lacks adequate space to service the student body. As such, the decision was made to locate the proposed design on the Ryerson campus as

fig. 16 - Site Plan

a replacement for the current space. Although many multi-faith centres are located within existing buildings, this option was rejected as it would have introduced an additional layer of complexity which would have detracted from the overall intent of the design. Instead, the proposed design is for a new, free-standing structure.

The site for the proposed multi-faith centre is the P Quad, which is, apart from the Kerr Hall Quad, the only green space on campus (fig. 16). The space is easily accessible to the entirety of the student body and as such it possesses a certain neutrality which provides an appropriate context for a multi-faith centre.¹⁶ The quad itself is roughly trapezoidal, and is bounded by Church Street to the west, the Architecture Building to the north, and the Rogers Communication Centre to the south. The eastern side of the quad is defined by a large curvilinear fountain. The fountain is partially sunken into the ground so as to maintain sight lines to the Cathedral Church of St. James, seven blocks to the south. Although the eastern edge of the quad is flush with grade, the western edge is raised a half meter above it. The northern, western and southern edges of the quad are bounded by a concrete retaining wall which serves as a continuous bench. This wall is interrupted briefly along Church Street by a flight of concrete stairs which provide access to the quad.

The proposed design runs along the northern side of the quad, parallel to the Architecture Building. Siting the building in this manner allows the remainder of the quad to the south to receive adequate sunlight to serve as a garden (fig. 17). The building is set back from the street in order to accommodate the length of a ramp. Not only is this ramp more accessible than the stairs which it replaces, it also serves to accentuate the transition from the street into the quad (fig. 18). The remainder of the concrete retaining wall is maintained in the proposed design, and is also capped by a continuous raised planter (fig. 19). Like the ramp, this planter creates a more defined boundary between the street and the quad. Both of these strategies are intended to differentiate the quad and the multi-faith centre from the surrounding context.

The decision was made early in the design process to construct the proposed

fig. 17 - View of Garden

fig. 18 - View of Main Entry

fig. 19 - View from Church Street

design primarily out of wood. This choice was made for two reasons. First, the versatility of wood as a building material makes it an ideal vehicle for the exploration of tectonic ornamentation.^{17,18,19} This versatility is evident in the variety of species of wood used in construction. Although these species share some material qualities, they may also differ substantially from one another. For example, all wood is anisotropic and features an inherent linearity.²⁰ Similarly, through the processes of growth all trees are characterized by annual rings, heartwood and sapwood. However, differing species of wood may also have differing qualities. For example, lumber yielded by different species may vary in size, colour, texture, density and elasticity. The qualitative continuity between species of wood tends to be articulated through the processes by which it is made into architectural elements. Conversely, the qualitative differences between species of wood tends to be articulated through the nature of the elements themselves. Thus, while black spruce, bur oak, and eastern red cedar may all be milled and sawn into planks, they are typically used to make different architectural elements. The straight grain of spruce is suitable for dimensional framing lumber, the density of bur oak makes it appropriate for flooring, and the rot resistance of eastern red cedar allows it to be used as exterior cladding.

The variety of species of wood which are used to make architectural elements, the variety of elements into which they are made, and the variety of ways by which they are made into those elements collectively allow many kinds of qualitative continuity and difference to be articulated within a single material. Furthermore, these same qualities allow wood to articulate spatial continuity and difference as well. For example, a building might be constructed of elements made from many species of wood, each of which are used in response to different spatial conditions which suit their particular qualities. Alternatively, a building might articulate different spatial conditions using elements which have been made entirely of one species of wood, but which have been worked in different ways. Or a building might use some combination of the two approaches. In any case, the use of wood simultaneously acts as a control variable while also providing a rich basis for forms of articulation.²¹

The second reason for choosing wood as the primary building material is simply because it is natural. As previously discussed, materials like wood articulate a connection to the natural world which is common to human experience. This connection is valued across cultures and religious traditions. As such, it is useful in the context of a multi-faith space, where the contrast between different systems of belief are especially conspicuous.

The versatility of wood may be seen in three buildings: the 12th century stave church in Borgund, Norway (fig. 20), the pagoda built at Hōryū-ji Temple in Ikaruga, Japan around 700 (fig. 21), and the Gates of the Grove Synagogue in East Hampton, New York, which was designed by Norman Jaffe in 1989 (fig. 22). These structures demonstrate the variety inherent in the material itself. While the church is constructed out of the heartwood of pine, the temple is constructed out of Japanese cypress, and the synagogue is constructed out of several species of wood, including red and yellow cedar. In each instance the materiality of these structures informed the processes by which they were made. Similarly, in each instance the materiality of these structures is articulated through various processes of making.

For example, the pine which was used to construct Borgund was allowed to stand before being harvested. This allowed the wood to become more resinous and therefore more resistant to rot. Furthermore, upon completion, the entirety of the church was coated with a form of tar created from pine resin to further increase its resistance to decay. These processes not only articulate the materiality of pine, they do so through a process of making which is highly material-specific. Conversely, the pagoda at Hōryū-ji is constructed around a central pillar called a *shinbashira*, which is used to help the structure withstand the forces associated with earthquakes. The 122 foot-tall pillar is made from a single cypress and the remainder of the building is dictated by the dimensions of this one tree. This is perhaps the epitome of material specificity in design. Although it is not as extreme, the articulation of materiality through making is also evident in the Gates of the Grove Synagogue. While the interior of the space is finished in yellow cedar panelling, the exterior is clad in red

fig. 20 - Sanctuary of Borgund stave church

fig. 21 - Section of the pagoda at Hōryū-ji Temple

fig. 22 - Sanctuary of Gates of the Grove Synagogue

cedar shingles. The decision to use different species of wood in differing spatial conditions articulates an certain understanding of how those species might engage with those conditions.

The versatility of wood is also evident in the structural and surficial diversity of the elements into which it has been made in these three projects. With the exception of the foundation, the entirety of the Borgund stave church is constructed from wood. Likewise, with the exception of the foundation, the roofing, and some ornamental features, the pagoda at Hōryū-ji is also constructed entirely from wood. Unsurprisingly, as a Modern building the construction of the Gates of the Grove Synagogue contains more complex assemblies. Yet even here the majority of architectural elements are constructed from wood. Across these three projects wood has been used to create columns, beams, rafters, trusses, bracing, cladding, flooring, roofing, sheathing, doors, windows, headers, sills, and more. Some of these elements have been left unornamented. Other elements, like the intricately carved door frames at Borgund, feature surficial articulation. Still others are structurally ornamental - the complex roof bracing at Hōryū-ji for example.

These structures do not only feature a variety of wooden elements, they also feature a wide variety of configurations of those elements in relation to one another. For example, the church at Borgund is notable for its use of stave construction. This system of grooved planks, sills, and headers presents a particular understanding of materiality and making. Conversely, the pagoda at Hōryū-ji features the use of *tokyō* to support its large overhanging eaves. This system of blocks and brackets articulates a very different understanding of materiality and making, despite the fact that the materials used in the two structures are in many ways qualitatively continuous with one another. Furthermore, the construction of the Gates of the Grove Synagogue articulates yet another understanding of materiality and making. In this instance the configuration of elements is so inventive it defies easy categorization. The unusual relationships between the walls, the columns, the beams, the roof and the ceiling each provide new insights into the qualities of wood.

In addition to demonstrating the material versatility of wood, these three buildings also demonstrate its universality. The pagoda at Hōryū-ji is thought to have been completed by 607, the stave church at Borgund was erected in the 12th century, and the Gates of the Grove Synagogue was built in 1989. Together, these three structures alone represent the continued use of wood as a building material for over 13 centuries. Moreover, they also demonstrate its use in varying climatic conditions. More importantly, they illustrate a relationship to the natural world which is common to human experience. The use of wood in the construction of a Christian church, a Buddhist temple, and a Jewish synagogue suggests that this material is valued across cultural and religious boundaries.

A MATERIALISTIC PRACTICE OF ORNAMENTATION

The proposed design for the Ryerson Multi-faith Centre was generated by the intersection of three orientations. The first of these is the urban grid of Toronto, which is rotated -17 degrees from geographic north. The second orientation corresponds to geographic east. The practice of orienting places of worship towards the east has precedent in Judaism, Christianity, Buddhism and Hinduism. The third orientation corresponds to the Kaaba in Mecca which is 56 degrees from geographic north in Toronto. Remarkably, the orientations toward true east and Mecca mirror one another across the east-west axis of the Toronto grid. As a result, although the proposed prayer hall affords three distinct orientations, it is also perfectly symmetrical. The intersection of these orientations not only defines the geometry of the prayer hall, but is carried throughout the entirety of the building. this may be seen in plan (fig. 23) as well as in section (fig. 24) and elevation (fig. 25)

The procession from the street to the prayer hall is marked by two thresholds. The first of these is the entrance to the building itself, which leads from a small vestibule into a larger foyer (fig. 26). The second is the entrance from the foyer into the prayer hall (fig. 27). The secondary service spaces are arranged in two groups which frame the procession from the first threshold to the second. Each of these groups contains a space for divestment, a space for ablutions, and a universal washroom. These spaces are organized in order to be accessible to those who require them without interfering with the experience of those who do not. This is accomplished by using the chevron geometry which defines the building to locate the entrance to each space behind the viewer.

Throughout the process of design the questions outlined at the beginning of this chapter were used to inquire into the nature of architectural elements and their relationships. Through this process of inquiry a distinct material strategy emerged which focused on ornamental configuration in lieu of ornamental figuration. This strategy is by no means the only viable approach to design – rather it is one of many

fig. 23 - Floor Plan

fig. 24 - Longitudinal Section

fig. 25 - South Elevation

fig. 26 - View of Vestibule

fig. 27 - View of Prayer Hall Entry I

equally valid ornamental approaches.

Most of the individual architectural elements in the design were left largely un-ornamented. Furthermore, most of the architectural elements in the building were constructed from different indigenous species of wood. These wooden elements were made through conventional processes of milling and sawing. As a result the structural and surficial characteristics of each element are also highly conventional – most are simply rectangular boards or slats of varying dimensions. However, although these elements are un-ornamented, they do articulate a particular material understanding. The quality which they articulate most clearly is the inherent linearity of the material. The processes of milling and sawing, as well as the forms which these processes generate, have become conventional precisely because they take advantage of this property.

The figuration of elements is used throughout the design to articulate qualitative continuity and difference. Qualitative continuity is articulated by creating architectural elements which are structurally and surficially similar out of different species of wood. The framing members, for example, are made from spruce, pine and fir, while the exterior cladding is made from cedar, and the interior finishes are made from bur oak, hard maple, and black cherry. By making similar elements out of different species of wood their common characteristics are articulated. Conversely, by using different species of wood in different spatial conditions their differences are articulated. Thus, although the flooring and the cladding both articulate the inherent linearity of wood, they also articulate some of the differences between maple and cedar. While the density of maple makes it a suitable flooring material, the ability of cedar to resist rot makes it a suitable cladding material. So, although these elements have not been extensively articulated, they are still articulate.

Although the individual elements which make up the building have not been articulated in an ornamental fashion, the manner in which they are configured in relation to one another is highly ornamental. And while the figuration of elements is used to articulate qualitative continuity and difference, their configuration in

relation to one another is used to articulate spatial continuity and difference. Like the figuration of the elements, these acts of ornamental configuration depend to a large extent on the inherent linearity of wood and the directionality which that quality implies. This may be seen to some extent in the design of the facades (fig. 28 - 29), but is most evident in the large number of elements which are configured to be either parallel or perpendicular to one of the three orientations which inform the geometry of the design.

The configuration of the flooring throughout the design serves as a prime example of this phenomenon (fig. 31). The floor is divided into sections which correspond to the structural system of the building. The southern wings of the resulting chevrons are perpendicular to the east, while the northern wings are perpendicular to Mecca. The remainder of the flooring, however, is oriented in the opposite fashion. The flooring on the southern half of the building is perpendicular to Mecca, while the flooring on the northern half is perpendicular to the east. The resulting pattern of ornamental nestings and adjacencies articulates the continuity and difference of space. Although the figure of each chevron articulates a difference in space, their repetition articulates a continuity of space. Likewise, while the two wings of each chevron articulate a difference in space, the configuration of the elements which make up those wings articulates a continuity in space.

An additional layer of spatial continuity and difference is articulated by using the same pattern of intersecting chevrons on the underside of the bulkhead which runs through the centre of the building (fig. 32). By using a similar configuration of elements to articulate a different spatial condition, a certain ambiguity is achieved. The spatial differences between the floor and the ceiling are obscured while their spatial similarities, namely their planar nature, are articulated. Through the ornamental configuration of elements, the two surfaces become mutually defining – they articulate one another. Furthermore, in conjunction they suggest that the various orientations which inform their configuration actually extend outwards beyond their own limits and into the world. In doing so, these elements not only

fig. 28 - West Elevation

fig. 29 - East Elevation

fig. 30 - Transverse Section

fig. 31 - View of Prayer Hall Interior

fig. 32 - View of Prayer Hall Entry II

fig. 33 - Photograph of 1:5 Wall Section I

fig. 34 - Photograph of 1:5 Wall Section II

articulate a different place in the continuity of space, they re-articulate space itself.

The ornamental configuration of elements is also used to articulate a spatial continuity between the interior ceiling and the exterior soffit (fig. 33 - 34). The wooden planks which make up the surfaces of both elements are arranged to be perpendicular to the east on the south side of the building, and perpendicular to Mecca on the north side of the building. Furthermore, the elements which make up the ceiling are precisely aligned with those that make up the soffit (fig. 30). This configuration articulates a relationship between the two conditions which is very similar to the previous example. While the orientation of the elements is used to articulate the spatial continuity between the ceiling and the soffit, the manner in which the elements are aligned to one another articulates the continuity of space more generally. Through the configuration of these elements the orientations toward the east and Mecca which inform the interior of the design are implied outside of the building as well. The ornamentation of the design differentiates it as a sacred space, even as it extends the qualities which make it sacred outwards into profane space.

Although these ornamental strategies are used throughout the design, ornamentation is also used to articulate significant moments in the building. These moments include the entry into the building itself, the entry into the prayer hall, and the east wall of the prayer hall. Each of these spaces is articulated through the introduction of architectural elements made from black cherry wood, a material which is not used elsewhere in the building. These elements are, for the most part, qualitatively continuous with the elements around them insofar as they have been fabricated using the same processes of making. However, this level of qualitative continuity makes their difference in materiality that much more noticeable. In these instances the difference in materiality is enough to articulate a difference in space. Furthermore, the continuity in materiality between these three spaces is enough to articulate a continuity in space. In this way, materiality is used to simultaneously articulate three different thresholds, while also uniting those thresholds into a clear

procession.

These three spaces are further articulated through the ornamental configuration of elements. At both the entry to the building and the entry to the prayer hall elements made from white oak are nested within the elements made from black cherry. Likewise, at the east wall of the prayer hall the elements made from black cherry are adjacent to elements made from white oak (fig. 36 - 37). In each instance the configuration of elements generates an alternating pattern of coloured stripes. While this pattern serves to emphasize the difference in materiality between the elements, it also operates as an ornamental motif. Like the black cherry wood itself, this stripe pattern differentiates these places from the spaces around them and articulates a spatial continuity between them.

fig. 35 - View of Prayer Hall East Wall I

fig. 36 - View of Prayer Hall East Wall II

REFLECTION

Over the course of this thesis theoretical analysis of texts and precedents provided a basis for understanding the nature of presentational ornament. However, the processes of designing yielded additional insights which had not become apparent in the course of theorizing. The first thing that became evident through the act of design is the highly idiosyncratic nature of ornamentation. Although the theory outlined in the first part of this thesis describes many distinct methods of ornamentation, some of these practices feature prominently in the design of the multifaith centre while others hardly feature at all. For example, the proposed design relies heavily on the ornamental configuration of elements in relation to one another. Conversely, very few individual architectural elements in the design feature any surficial articulation at all. While the design speaks to the materiality of wood and the processes by which it is made into elements in a broad sense, it also speaks to my particular understanding of that materiality and those processes more specifically. It is not difficult to imagine that the ornamental mode of investigation put forward in this thesis could generate a very different design in the hands of another architect. Thus, while ornament ultimately serves as a means of communication, it also serves as a means of self-expression.

The second thing which became clear in the process of design is the manner in which ornament is able to address programmatic or contextual considerations without operating in a representational capacity. This may be seen in the intersection of the three orientations which generate the geometry of the design. While the orientations towards Mecca and the east facilitate the programmatic function of the building, the orientation to the urban grid of Toronto locates the design within a particular place. Although these orientations are not ornamental in and of themselves, the patterns which are generated through their relationships to one another are. The notion that ornament can convey this kind of information in a purely presentational capacity is both powerful and surprising. This idea conforms

to the conventional understanding of what ornament communicates while simultaneously defying the conventional understanding of how it communicates. In a sense this serves the interests of both the people who use buildings and the architects who design them. On one hand presentational ornament may allow the lay person to more easily grasp the function of a particular building and thus engage with architecture more broadly. On the other hand presentational ornament allows the architect to engage with the public without reference to phenomena outside the discipline.

However, the most significant aspect of ornament which became clear in the course of design is the manner in which it is able to elucidate the intimate connection between materiality and space. By using ornament to simultaneously investigate materiality and space novel aspects of both “things” came to light. In many instances the ornamental articulation of materiality provided a fresh insight into the articulation of space. Similarly, the ornamental articulation of space often prompted a re-examination of material conditions. This relationship may be seen in the connection between the aforementioned spatial orientations which generated the geometry of the project and the inherent linearity of wood. In this instance the directionality implied in both considerations brought the two lines of inquiry together. Within the final design the orientation of space and the linearity of wood mutually articulate one another. This example highlights the generative potential of ornament and the manner in which articulation contributes to the iterative processes of design. Ornament is not only a means of communication and self-expression, it is also a means of investigation. Architects may use ornamental inquiry to discover spatial and material qualities which they may choose not to communicate, or to come to a particular understanding which they may choose not to express. In other words, ornament may be a useful tool, even in the design of un-ornamented buildings.

Collectively, these reflections point to the real power of ornament: the fact that it operates as a tool for both investigation and communication. As a process of design presentational ornamentation may generate profound insights into the nature

of the material world, the ways in which we shape that world, and our place within it. As a product of design, presentational ornament may convey those insights with an immediacy which representational architecture simply cannot. Ornament allows architects to explore the materiality of architectural elements, the processes by which they are made, the diverse ways in which they relate to each other, both spatially and qualitatively, as well as the ways in which they are situated within the discipline of architecture. Through all of this, ornament also allows architects to examine fundamental architectural concerns such as program and context in a new light. Ornament concentrates all of these considerations into a physical form which is intensely personal but also highly legible. On one hand, a return to ornament would provide architects with a renewed means for engaging with their discipline. On the other hand, it would also provide architects with a renewed means for engaging the public more broadly. Ornament is not only a crucial part of the practice of architecture, it is a crucial part of how architecture operates as a cultural force in the world.

APPENDIX 1 - PROCESS

fig. 37 - Plans & Sections of Scheme I

fig. 38 - Plans & Sections of Scheme II

fig. 39 - Studies of the Intersection of Three Orientations

fig. 40. - Plans, Sections & Elevations of Scheme III

fig. 41 - Plans & Elevations of Scheme IV

fig. 42 - Plans and Elevations of Scheme V

fig. 43 - Plans of Scheme VI

fig. 44 - Circulation Studies

fig. 45 - Sections & Elevations of Final Scheme

fig. 46 - Plan Details of Window Conditions

fig. 47 - Section Details of Window Conditions

fig. 48 - Section Details of Window Header and Roof Assembly

fig. 49 - Elevations of Window Conditions

fig. 50 - Wall Sections

fig. 51 - Photograph of 1:1 Door Handle I

fig. 52 - Photograph of 1:1 Door Handle II

fig. 53 - Photograph of 1:20 Model Vestibule

fig. 54 - Photograph of 1:20 Model Main Entry

fig. 55 - Photograph of 1:20 Model Prayer Hall Entry

fig. 56 - Photograph of 1:20 Model Prayer Hall I

fig. 57 - Photograph of 1:20 Model Prayer Hall II

fig. 58 - Photograph of 1:20 Model Prayer Hall III

fig. 59 - Photograph of 1:20 Model Prayer Hall IV

fig. 60 - Photograph of 1:20 Model Exterior

ENDNOTES

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