In-Between: Architectural Drawing and Imaginative Knowledge

Hooman Koliji

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Paul F. Emmons

Steven R. Thompson

Mark E. Schneider

Marcia Feuerstein

Carol Bier

Patrick A. Miller

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ALEXANDRIA, VIRGINIA

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HOOMAN KOLIJI

ABSTRACT

Design drawings mediate between the world of ideas and the world of things, spanning the intangible and tangible. However, contemporary technical architectural drawings, in establishing a direct relationship between the drawing and its object, tend to base this relationship on a visual paradigm that authenticates the visible physical world over the conceptual invisible world, including that of the designer’s imagination. The result is that the drawing may become a reduced utilitarian tool for documentation, devoid of any meaningful value in terms of a kind of knowledge that could potentially link the visible and invisible.

The imaginal drawing, assuming mundus imaginalis, is an ontological third world mediating between the invisible and visible worlds. As such, it offers an alternative view of the architectural drawing. Inhabitants of this domain are subtle bodies that hold physical attributes (e.g. form, proportion, color), highly evocative, yet with no matter. Representing a world of similitudes, the imaginal is fundamental to the field of architectural representation, as it introduces a perspective in which the architectural drawing finds an ontological home, wherein the drawing becomes a true in-between territory, mediating between the invisible and visible. In this realm, the drawing becomes a subtle architecture in itself.

Prevalent Islamic geometric architectural drawings, namely girih, which lend themselves to the imaginal, provide clues by which the drawing is recognized as an in-between. The geometric interlocking patterns they feature, the girih mode, represent a creative agent by which the built transcends the physical world and penetrates realm of spirituality. An examination the girih mode in its intellectual, imaginative, and physical contexts re-identifies these geometric drawings as a productive realm of consciousness.

As an aperture to the imaginal, these architectural drawings open the door to a world of its own, wherein the drawing has a true subtle existence. In this view, the drawing starts from the domain of human imagination with the possibility of ascending to the realm of the intellect, while at the same time descending to the realm of the senses to guide the architect toward a built object. Seen this way, the imaginal drawing can offer an in-between state of being and becoming, a subtle matter, lighter than the building and denser than the idea—essentially representing a mode of consciousness involving the conscious imagination.
DEDICATION

to *daya*, my grandmother
ACKNOWLEDGMENTS

This has been a unique journey for me: both materially and intellectually: Materially in the sense that as a designer I engage in the act of conceiving and making things differently than in the past; and intellectually in the sense that I have developed an expanded view of what we do as designers. As a passionate designer, it is fair to say that this journey has penetrated deep, personal and intimate layers and has challenged my thinking—often in emotional ways. The result was re-discovering my “self” as an educator, designer, and human. I would like to express my sincere acknowledgements to a group of individuals who nurtured and edified the process of re-experiencing my “self.”

I am deeply grateful to Dr. Paul Emmons for opening my eyes to ways of beautiful thinking. Your inspiring visions and manners—thorough and generous—have been a treasure in crafting this study. You showed me how to be imaginative, yet precise. I wish to thank Professor Steve Thompson whose insights have been inspiring and spirited in polishing and perfecting my ideas. Our conversations guided me not to lose sight of the in-between. To Dr. Mark Schneider I extend special thanks for reminding me to own my ideas, as well as for providing me with a critical angle on connecting philosophical ideas to architectural things. I thank you, Dr. Marcia Feuerstein, for offering me your insights on the rich relationships between architecture and thorough reading of drawings. I also gratefully acknowledge the input of Carol Bier for her in-depth vision on the cultural and historical aspects of the study, and for reminding me of the role of demonstration in the imaginal. I wish to express my sincere appreciation to Dr. Patrick Miller for his continued intellectual feedback from the commencement of this study to its conclusion, and for constantly encouraging me stay in-between landscape and architecture.

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… the present study owes a great deal to an invisible angel who made visible angle to the world of wonderment…
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Fig.0.0. Imaginative reconstruction of a wooden lattice, colored glass window.  
Drawing by the author.

IMAGINATIVE DRAWING AND THE IN-BETWEEN

An Imaginal Window

A late afternoon, a long day spent wandering inside the rooms and outside in courtyards of the old mansion—a sketchpad in hand in search of views to draw. Something across the courtyard penetrates the corner of my eye. Strong and different enough to turn my attention to it. Bordered by darkness and shadow, a bright and deep colorful pattern through a frame of stucco wall and wooden rods emerges. Soul-capturing and heart-moving to stir emotions, leaving me with a sense of wonderment.

Vibrant colors melt into each other across the wall of the interior chamber, lit by the projection of the low radiance of the sun passing through the geometric wooden structure of the stained glass window, seen through the half open window. The lit pattern is delicate: it is out there, yet not completely lending itself to the world of materiality. The bright pattern is a light-shadow that attests presence of invisible light already occupying the entire space—yet hidden to our eyes, a subtle matter mediating between intangible light and the tangible reality of the building.

An array of planes, the stucco wall, wooden window, and the illuminated colorful wall overlay, creating a range of spatial projections. The interplay
between planar space and spatial depth maintain the viewer in a mode of suspension, between readings of two-dimensional surfaces and perspectival three-dimensional space. While the former seems to be a relatively autonomous conception of each layer, the latter is an embodied perception. One associates the first with the mind’s ability to read each plane as an entity, while the second emerges as a sensory experience.

The impatient drawing tools, however, are incapable of fully capturing “it.” For “it” is not a thing, but is of things—a congregation of thresholds and intermediaries with distinct unified presence. It is not pure light, but an indication of it. “It” is not about the raw materials put together, yet “it” could not be there without them, a concurrent sense of “it” . . . and yet not “it.” “It” is simultaneity of existence and non-existence, too airy, ethereal, and subtle to be captured in a style of drawing appropriate to solid substance, yet present enough to want to try.

Suspended between contemplating the complex, yet distinct, geometric patterns of the window, and enchanted by the intriguing fuzzy color patterns on the stucco walls that seem to violate the precision of their source, I realize that true involvement requires bridging reason and experience. “It” belongs to a world of its own, my world, that exceeds the visual encounter or discursive thought—yet connecting the two, an imaginal experience bringing consciousness and knowledge together. The drawing remains in a state of betwixt and between, capturing the reality of what is seen by sight and the image evolving inside. “It” becomes an opening to that world.

What is “it”? The thing out there? The drawing? Or the imaginal inhabitation of that?

“It” is both the objectivity of the edifice and the subjectivity of the observer. “It” alludes to a spectrum of imaginal modes of beings/worlds: from the materiality of the thing, to quasi-material/immaterial, to the immaterial imagination.

Emotion and wonderment, a subtle mode of consciousness, attests to an elegant revelation of architecture, as well as a state of being of self. Architecture has the power to create such an experience, combining raw materials in such a way as to create an emotional response, thereby instilling or unveiling the immateriality of architecture. How can architectural drawing embody such transference? To what domain does it belong?

Comparable to projected light from a stained glass window, the architectural drawing embraces this subtle and intermediary nature. It is an existence in itself, offering an etheric yet tangible reality that leads us to conceptual realms or material construction of the architecture. The quest for understanding the nature of the light-shadow projected from the window as an intermediary, between the room and light—and here understanding is
associated with drawing—directs the quest to that of the architectural drawing.

On Drawing

The conventional view of architectural drawing today\(^1\) presents it as a neutral tool communicating architectural thought into architectural practice. This view regards the architectural drawing as a passive vehicle for transfer between the architect and the building. Based on an assumption of transparency between the drawing and the building, this view presents a “paradigm for architectural knowledge based on a visual relationship between an idea and a built work.”\(^2\) Architectural drawing, in this sense, presumes non-ambiguity with respect to the eventual material object, namely, the building. This model can be seen as a utilitarian convenience for the transference of the architect’s “design thinking”\(^3\) into pictorial representations. Indeed, implanted in this model is the acceptance of the authority of visual faculties to negotiate the communicative aspects of the drawing. This position denies discursive, imaginative, and experimental elements in the architectural drawing. Consequently, it fails to recognize the drawing as an essential meditative apparatus. With the promise of “like-ness” and “transparency,” the architectural drawing is reduced to a two-dimensional pictorial detour standing for an authentic complete entity—the building. It is in this view that the drawing imparts knowledge of what the built form \emph{will} be; it is, however, incapable of suggesting what it \emph{could} be, which represents a contemplative mode that takes the viewer beyond the surface of the drawing to its potential cogitative depth. Walter Benjamin has pointed out the importance of cogitative space in the drawing:

\[\ldots\] what is crucial in the consideration of architecture is not seeing but the apprehension of structures. The objective effect of the buildings on the imaginative being of the viewer is more important than their ‘being seen.’ In short, the most essential characteristic of the architectural drawing is that ‘it

\(^{1}\) By using term “conventional view” I refer to the dominant view in practice in which often regards the drawing as a pragmatic means to communicate technical issues.


\(^{3}\) I have employed the frequently used term, design thinking, to associate this terminology to the conventional view regarding contemporary architectural drawing.
does not take a pictorial detour.\footnote{Benjamin, W. 1988: 89-90.}

The “pictorial detour” denotes the loss of authority over all possible readings and expressions of the architectural intention, leading to a denial of recognizing the drawing as a fertile site of architectural production—and thus architectural knowledge. Benjamin’s arguing for the imaginative inhabitation of the drawing and for distancing the architectural drawing from like-ness (to the built object) can be seen as two sides of a coin, each side affirming the other. Once inhabited, the drawing engages the individual’s mental faculties and will direct him or her to possible interpretations that are invisible to the eye. That is, the visible drawing, characterized by marks on a surface, serves as an intermediary visual language, taking the viewer to invisible realms not rationally or immediately accessible at first glance. Indeed, such a semantic journey starts with the sense perception of sight, i.e., with the eye of the body. However, as reported in historical sources, through a scrutinizing gaze one can penetrate what early Islamic scholars (e.g. Al-Farabi, Avicenna) would call the inner eye of the mind or the eye of the soul. In this sense, drawing bridges the visible and invisible and invites the viewer to inhabit a third world of the in-between. This third world is experiential in the sense that one would engage the drawing (as a thing) through visual sight, while exceeding experience as one could see the potentiality of spaces the drawing suggests and imaginatively inhabits them, yet not fully lending itself to the world of concepts. That the conventional view of the architectural drawing does not recognize this “in-between-ness” pertains to the dominant dualistic worldview in a broader context.

Architecture\footnote{Architecture, here, is used in the broadest sense of the term, which also represents landscape architecture.} today resides in a fragmented world where the separation between the intellect and senses has created a duality that has influenced the field in manifold ways. By segregating the art and science of architecture, our epistemological relationship to the drawing is subject to change. Additionally, this fragmentation is impacting both our understanding and creation of architecture through drawing—a division leading architecture into component parts: theory and
practice; ideality and materiality, the invisible or intelligible vs. the visible or sensible, and to some extent, inside and outside.

This twofold view of the world, ironically, makes possible the existence of an “in-between” state that lies betwixt the mind and body—an “in-between” that is both created and neglected, simultaneously. It comes into being due to the existence of the two sides, but can remain elusive due to the absence of a structure of understanding based on non-dualism. Under a dualistic perspective one could claim that while existence of an “in-between” is inferred, it has been largely eliminated.6

Under such dualistic condition, architecture (i.e., architectural discourse, design, knowledge, and representation) is restricted to our mind and to our senses, which in turn comprises a dual existence. As such, architectural drawing assumes the same dualism: diagrammatic drawings (associated with the mind’s analytical attributes), and technical drawings (associated with materials and construction) become dominant facets defining the world of the drawing. In either case, the drawing holds a world of its own—that of imaginative capacity to direct the individual to see the multiplicity of spaces through the seemingly thin surface of the drawing, leading the individual to a unique mode of understanding.

This leaves us to wonder what kind of understanding might come to us that could bridge the “intellect” and the world of “sense,” an in-between mode that is fully realized in the architectural design. Perceiving design as a “process of suspending architecture in a perpetually evanescent and temporary state of ‘in-between,’ between Reason and Experience, where becoming and fading away, growth and decay, presence and absence, reality and fiction, silence and speech take place simultaneously…,”7 one is compelled to ponder the substance of this in-between, which seems to be realized in the architectural drawing. This is the core quest of this study.

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6 The Western duality described by Descartes reached a culmination in the present when Derrida claimed that Western thought has pushed the dualism towards to its extremes by introducing his philosophical perspective of “binary oppositions.” Architecture, and architectural knowledge, has slipped into a similar binarity as well.

It is crucial to study the status of the in-between in the context of the present study as it relates to the architectural drawing. I argue that if there is no such in-between state, the drawing ontologically will inevitably fall into dualism and belong to one side or the other—the rational thinking side or the realm of sensory experience. Too often, we assume architectural drawing to be diagrams imparting pure information, as opposed to expressive drawings, as paintings, which are about purely sensibility. However, if the drawing ontologically finds associations to a self-subsisting in-between, then an entirely new perspective for architectural design can be found.

The search for the fertile in-between as a mode of existence mediating between the visible and invisible, the rational and sensory realms in architecture, raises a multiplicity of questions on various levels as to the nature, function, and medium of such an intermediary realm. Central to this investigation, then, is clarification of the status and role of the architectural drawing in relation to this prolific yet neglected realm.

On the Eliminated In-Between: Imagination

The in-between of our discussion—connecting reason and experience is identified with the imagination. This is essentially a philosophical view that assumes a triplicity of worlds, unlike Cartesian duplicity. In both Western and non-Western philosophical perspectives, the imaginative faculty has long been recognized for its cognitive function in relating sensory experiences to the rational faculty, “a power mediating between the senses and the reason by virtue of representing perceptual objects without their presence.”8 This is in fact the creation of things at their first stage, or giving birth to things in tangible and visible levels of existence. Imagination, primarily associated with the ability to produce images, is capable of modifying collected images via memory and producing new images, and thereby is a productive agent.

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8 Brann, E., 1992: 24. A discussion of Western philosophical perspective on the notion of the imaginative faculty, in itself, would require a long discussion. In order to maintain coherency of the conceptual horizon of the dissertation, the present study will concentrate on Islamic philosophy and does not expanded the discussion to a comprehensive study of the subject in the West. The discussion, however, will include Western relation to Islamic (in Part One) philosophy as appropriate.
Beyond its psychological function, imagination has long been recognized for its noetic power of contemplating the truth, evident in Islamic mysticism. In traditional cultures, imagination was held in high esteem, in part because it was often associated with deciphering theology. Brann states: “The sharpest valuations of the imagination and its works in the world are to be found with respect to faith and religion. If in philosophy the traditional standing of the imagination is ambiguous - at once suspect and necessary - it is in theology that the faculty and its productions are most forcefully apprehended as evil or as good.”9 At least in the context of religion, imagination has the power to inform the world.

In the West, Neoplatonism argued for worldly imagination, a realm of existence with spiritual attributes capable of mediating between the visible and invisible —thereby informing the visible world. Plato’s analogy of the divided line suggested to the Neoplatonic perspective the world of visible and invisible as defined in four planes of reality from the lower sensible to the higher intelligible.10 As such, imagery and visual representations became capable of facilitating this mediation. The amalgam philosophy was highly mystical and included symbolic reading of the visible world as to reach the invisible. This impacted visual arts and culture, as they became laden by symbolic expressions. The allegorical attributes of imagery called for a contemplative scrutinizing gaze in order to take the viewer beyond the surface of the image.

Eastern Islamic philosophy (central to the present study) took a similar position for two primary reasons. First, the early centuries of the flourishing philosophical and scientific movements in Islamic lands were largely influenced by a Neoplatonic reading of Plato and Aristotle. Second, the holy Koran, with its mystical language, permitted and encouraged symbolic interpretations to be developed via Islamic scholasticism, particularly those of the 9th centuries onward that attempted to combine the philosophies of Plato and Aristotle. This mystic view dominated the Islamic world, including that of architecture and the visual culture.

The notion of worldly imagination, mediating between the worlds of ideality and reality, reached a zenith in Islamic mysticism and negotiated with all aspects of traditional human life including arts and crafts.\textsuperscript{11} The world of imagination was recognized as a self-subsisting creative domain, constantly informing the visible world of phenomena. This world, however, requires a faculty appropriate to it. Islamic thinkers called it *quwwa al-khayal* (lit. faculty of imagination), which is an internal faculty of the soul with cogitative power between reason and the senses. This level of the in-between is operative at the “psychological” level while pertaining to “cosmological” horizons. Images and drawing associated with the imagination can potentially serve as intermediary symbolic representations leading humans to higher levels of understanding beyond the visible world. As such, the physical artifact can be regarded as a manifestation of the in-between with a symbolic referential function. It is under this perspective that architectural drawings of the Islamic world, which are mainly characterized in a geometric mode, have mediated between cosmological conceptions and the mechanical laws of the physical world.

Central to this was the notion of imagination mentioned above. The present exploration of the in-between—as it relates to imagination and representation—concentrates on Islamic visual culture, particularly that of Eastern Islamic lands of the 14th to 16th centuries, especially from the Persian plateau.

This view of imagination as belonging to an in-between realm changed in the West beginning in the 17th century with the introduction of new philosophical perspectives that searched for worldly certainty through rational thinking. Imagination, once recognized as an insightful faculty of noble men capable of mediating between higher realms of spirituality, was replaced by the professed superiority of the rational mind, representing a radical distinction of mind and body and constituting the basis of Western sciences. In short, the senses became unreliable. This change struck the Islamic world nearly two centuries later in the 19th century.

Rene Descartes’s (1596-1650) influence on the fate of sciences, and to great extent philosophy, contributed to the elimination of the notion of in-between, i.e.,

\textsuperscript{11} Nasr, S. H. 1987.
imagination. Coded in his *cogito ergo sum* ("I think, therefore I am") is privileging human reason as the sole proof of existence. With the radicalization of the Mind and its separation from the Body, privilege was given to discursive reasoning as the sole way to direct humans to the truth. Sense perception, belonging the realm of bodily extension, was deemed unreliable and devoid of value in terms of knowledge. In such circumstances, imagination could be marginalized as a peripheral attribute of the bodily senses. Sciences, derived by reason and experience, essentially took charge of defining imagination, and psychology became the main field of imagination.\(^{12}\) Works of Sigmund Freud (1856-1939) and Carl Gustav Jung (1875-1961) in the field of psychology viewed imagination from a scientific lens. Descartes has been dubbed the father of modern philosophy, yet various thinkers have continually challenged Cartesian rational philosophy. Giambattista Vico (1668-1744), in his "Science of Imagination," declares that the existence of human institutions is from the imagination.\(^{13}\) The circle of German idealists starting with Kant (1724-1804) also criticized the primacy of critical reasoning in defining the human condition. Kant defines imagination as an "art hidden in the depths of the soul whose true modes of action we shall only with difficulty discover and unveil… ," \(^{14}\) and associates imagination with transcendental power for structuring perceptual cognition. For him, imagination was an indispensable function of the soul—a means to obtain understanding.\(^{15}\) Other scholars such as Schelling (1775-1854), who viewed imagination as a power of uni-forming and in-forming its matter, also considered imagination as an in-between ontologically-verifiable realm. Referring to it as activity and power, Schelling considers imagination as wavering between finitude and infinity and mediating between theoretical and practical territories. Believing that imagination is the source of creation of ideas, he writes: "What is commonly called theoretical reason is nothing else but imagination in service of

\(^{12}\) Works of Sigmund Freud (1856-1939) and Carl Gustav Jung (1875-1961) in the field of psychology viewed imagination from a scientific lens.

\(^{13}\) Vico discusses that existence of human entities owe to the imagination and not to reasoning. For more discussion on this see: Verene, Donald Phillip. *Vico's Science of Imagination*, 1981.

\(^{14}\) Kant, I. 1991: 144.

\(^{15}\) Ibid.
freedom."\textsuperscript{16} This view is generally regarded as Romanticism's attitude towards the notion of imagination.

In the present condition, which has fostered our conventional view of architectural drawing, imagination at best is viewed at a psychological level. Under this framework, there is a tendency to associate imagination with subjectivity. This is a view that is promoted by the sciences. As Brann reminds us that in "psychology, the preference is for defining the class of representations, that is, the mental imagery, rather than the faculty. Mental imagery is a quasi-sensory or quasi-perceptual experience which occurs in the absence of the usual external stimuli and which may be expected to have behavioral consequences different from those attendant on their sensory counterpart."\textsuperscript{17} Once imagination loses its status as a productive human faculty, it naturally loses its legitimacy to serve as an ontological domain for architectural drawing.

The Cartesian perspective was also criticized by Perennial philosophers\textsuperscript{18} who argue for universal truths on the nature of reality and humanity. Philosophers of this circle largely believe in the value of symbolic understandings that traditional cultures developed, based on the eternity of divinity and mortality of humanity. They view a shift in the history of human thought: divine-centered philosophy of the traditional world was replaced by the human-centered idea. Therefore, the idea that imagination, which was once regarded as a category of being and a unique faculty to mediate humans with higher spiritual realities, began to evolve into a reliance on reason. This also echoes a gradual shift of contemporary philosophy from ontological concerns to epistemological quests. As a result, the status of the in-between and imagination once again experienced a change, as evidenced in this statement from Brann, who explains the status of imagination in a postmodern world:

> The postmodern paradigm dismisses traditional attempts to ground the imagination philosophically and dismantles it as a category: The image is an

\textsuperscript{17} Brann, E., 1992: 24.
\textsuperscript{18} Perennial Philosophy, (adopted from Greek \textit{perennis} meaning continual and lasting through the year), also called perennialists “have attempted to identify common mystical experiences across cultures and traditions.” See: Gellman, J.: 2011.
outdated vestige of humanism, for it requires the notion of a nuclear human self. Consequently the imagination is deprived of the definite article; the operative postmodern term is "the imaginary," which denominates the illusional contrivance of a false individual or social self. ... Moreover, the imagination requires for its exposition concepts of truth such as meaning and reference, which are exploded in postmodernism. Thus the philosophy of truth and of the imagination, which once stood together, now fall together. ... Accordingly, the image, too, disappears. It dissolves into "parody," a reflexive, labyrinthine play of mirrors, in which the multiplying reflections are not anchored in any original. Resemblance, the traditional representational mode, is distinguished from similitude ..., which abandons the notion of reference with its hierarchy of original and imitation. The copy parodies itself in a series of lateral repetitions. The representational intention is deliberately unsettled. A paradigmatic work of imaginal postmodernism is Magritte's picture of a pipe with a curved stem.19

Magritte's note under the painting, ceci n'est pas une pipe (this is not a pipe), well exemplifies a critique of naïve realism that argues for absolute visibility. This representation challenges the contemporary concept of image as unreal (Fig.0.1). With the disassociation of truth and imagination, and without a symbolic referential role, the image then loses its authority to unveil the truth or to serve as window to it. Visual perception, therefore, dominates the world of imagery including that of drawing. Regarded as unreliable in Cartesian thought, sight perception at best could verify the trustworthiness of the image and the drawing based on its “likeness” to the real world. It is in this condition that neither imagination nor image serves as mediating between the worlds of ideality and reality.

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In the absence of a self-subsisting world of imagination, architectural drawings are no longer concerned with taking the viewer to the realm of ideality. Rather, they become transparent prescriptions, operating within a visual paradigm, to be realized exactly as drawn. When architectural drawings merely record thought for practice, a shift occurs to move them away from their creative potential as a world of their own. Under this view, the true value of architectural drawings is measured against the "lifelikeness" of the building and not for its expressive nature. With this shift there is a split between practical drawings as technical and real (e.g. Revit) and imaginative drawing as ideal. As such, imaginative drawings are perceived as unreal and therefore less likely to impact the world.

As a consequence of that shift, there is also a removal of concentration from both worlds of ideality and reality to only the real world. Abandoning its quality of in-between-ness, the architectural drawing cannot be viewed as a frame through which the soul could see the world. Neither architectural drawings nor architectural design, in this sense, are recognized as a means to obtain or create knowledge. That is why today the positivistic paradigm for architectural research is not inclined to embrace the idea that the practice of drawing can lead to imaginative knowledge.20

Nonetheless, the case for imagination as a noble quality, connecting absence with presence, remains a subject of interest to many contemporary philosophers. Although postmodernism marked a point at which the image became less important, this “crisis of the post-modern image has not always led, however, to the declaration of the ‘death of imagination.’”21 As Kearney informs us, “there has arisen a hermeneutical reading” of imagination. This post-modern hermeneutic of imagination:

…relocates the crisis of creativity in the context of a world which is refigured or prefigured by our imaginings. The apocalypse of floating signifiers is

20 Indeed, in the past few decades, with the dominance of positivism, a legitimate descendant of Cartesian rationalism has defined “knowledge” as a “set of interrelated propositions” which is remote from imaginative capacities of human. To a great degree, this point of view has defined architectural scholarship and knowledge too.

reconnected once again to the discourse of a life-world of affectivity and event. This does not mean a return to a foundational ontology or epistemology, which would seek to anchor our images in decidable categories of knowledge and being. What it does mean is that the imaginary is now recognized as a process, which relates to something or somebody other than itself.  

The hermeneutics of imagination, which allows the image to be recognized as a creative procedure, and to direct the viewer to the other, is an act of “worldmaking.” In this sense, the imagination becomes a world that ontologically is true and co-exists with the world of phenomena. Goodman argues for such parallel worlds: “The many stuffs—matter, energy, waves, phenomena—that worlds are made of are made along with the world. But made from what? Not from ‘nothing, after all, but from other worlds. Worldmaking as we know it always starts from worlds already on hand; the making is a remaking.” The imagination makes the invisible (i.e., other) visible, and in so doing creates an ontological world. This conception of worldmaking, and its potential connections to architectural representation, has been explored by Frascari, who discusses the transformative nature of representation in the sense that the outside world is ingested into ourselves and then on paper. This suggests the existence of a creative realm mediating between reason and sense. Nevertheless, the search for a middle realm or the in-between in architectural discourse requires further attention.

On the Sum and Substance of This Study

In-between-ness, seen through imagination, visual representation, and material manifestation (the context of the present study), no doubt requires investigation across multiple disciplines. Here, the focus is on the architectural drawing as a state of in-between.

The present treatise studies the architectural drawing and examines its relevance to imagination and building. The drawing studied here is mainly identified as the geometric drawing, namely girih, which was widely used by architects and masons of the Islamic world beginning in the 10th century. The imagination here includes such pertinent theories from the same era. An immediate reflection of these geometric drawings in a building is identified as a specific lattice window. In summary, the present dissertation is structured around the study of the in-between in pre-modern Islamic architecture. Importantly, this in-between state is studied at three levels: (1) ontological and operational (i.e., a self-subsisting world and as cognitive faculty), (2) epistemological and representational (i.e., image and architectural drawing), and (3) materiality (i.e., artifact/ the architectural element of window).25

The following horizons define the scope of the present study and help to structure this dissertation.

1- *Conceptual horizon*: The notion of imagination as an ontological world is viewed through Islamic philosophy, particularly those that are associated with theosophy or mysticism.

2- *Historical horizon*: The discussion will entail an overview of early Islamic philosophical thought (from the 9th to 12th centuries) to contextualize later mystic perspectives, which culminated in the 13th century and continued to develop in the next few centuries.

3- *Geographical horizon*: The study will concentrate on the Persian plateau, where much of the mystic thoughts were embraced and developed, and where the geometric mode of girih was also widely practiced.

4- *Means and tools*: Using hermeneutics as the main vehicle, the study will include historical research on the materials (i.e. drawings, paintings, artifacts) as well as philosophical readings of key intellectual figures.

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25 For discussion of the window, see Part Three.
Given the rich historical context of such discussions in the traditional (pre-modern) Islamic world, a variety of study methods can be adopted. The literature of art and architecture of the Islamic world can largely be classified into two major categories with regard to their method of investigation: one that is more archeological-driven and evidence-based, and the other that is more concerned with poetics and mystical readings. Similarly, Samer Akkach identifies two major approaches: historico-cultural and mythico-spiritual. Let me discuss each of these approaches briefly and examine their appropriateness for the present study in order to establish the method of this study.

A historico-cultural approach, a product of modern intellectualism, seeks knowledge through historicizing and contextualizing phenomena, as well as by adopting discursive reasoning to obtain knowledge. With this approach comes a universe of rational thinking, verifiable arguments, and academic curiosity. Above all, a historico-cultural approach shifts the concentration from the divine to man, a shift that has been criticized by those who question the ability of modern thinking to fully penetrate the pre-modern world. Some architectural historians (such as Oleg Grabar, Gulru Necipoğlu, and Sheila Blair, for example) tend to fall into this category. They see evidence-based arguments through historical texts and artifacts.

The present study, by committing to the very definition of dissertation, will argue for a methodological approach that obtains a contextualized understanding of the notion of imagination and architectural drawing (particularly as pertaining to the in-between). In this sense, a historico-cultural approach seems to be a proper approach to adopt. Under such an approach, a persuasive argument can only emerge from a study of both historical sources and historical artifacts, and the value of such a study is to demonstrate how much the research question finds concrete evidence in the historical past. A substantial component of the present study will be based on the above paradigm.

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27 Such scholars as Titus Burckhardt and Seyed Hossein Nasr would argue that modern intellectualism cannot fully penetrate the traditional world; therefore, is incapable of fully comprehending phenomena as they existed in the pre-modern world.
However, in order to penetrate spiritual and metaphysical concepts, a more interpretive paradigm is needed. For example, a better understanding of the concepts of worldly imagination or beauty—which are frequently found in theological and mystical sources—requires an interpretive lens that differs from that of a mere evidence-based study paradigm. Interestingly, Necipoglu notices a lack of such studies and mentions: “As in medieval Europe, which did not have an aesthetics independent of scholastic philosophy, in the Islamic world concepts of beauty often were embedded in metaphysical discussions. The relevance of such philosophical texts for architectural and artisanal production has not yet been explored systematically.” Additionally, the lack of a robust tradition of written and visual architectural treatises in the Islamic world (in comparison to the West) makes such a contextualized study more difficult—albeit intriguing and highly rewarding. Answers to this question could result in a more holistic way of practicing architecture—featuring design thinking, conceiving space, and elucidating the relationship between idea and building—all of which dominated the Islamic world.

With only a few extant sets of geometric drawings and treatises, most of which belong to the 15th century and later, a comprehensive study will require reaching out to historiographies, books on crafts, and practical geometry treatises. These scattered sources, however, provide the reader with insights concerning buildings at the time. For conceptual and philosophical conceptions, my main sources were theological writings laden with mystic notions, poetic analogies, and symbolic representations. Although much of what is found in such sources pertain to mysticism and divine discourse, the aim of this study was to extract information about architecture and how ideas of the time relate to architecture then and now. These sources, having influenced the art and architecture of their time, can be used as valuable resources for gaining an “insider’s view.” This approach is favored by a second alternative research paradigm.

Akkach explains the second paradigm, mythico-spiritual, as arguing for the universality of truths. Perennial philosophy, as noted above, is a major advocate for this approach. Associated with philosopie perrenis, the Traditionalist School, which

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became widely developed by Rene Guenon (1886-1959), takes a metaphysical approach to its subjects of study. Among the leading thinkers of this circle are Titus Burckhardt,\textsuperscript{29} Itushi Izutsu, and Seyed Hossein Nasr, all of whom argue for the universality of traditional values. Comparative religion promoted by this circle of scholars also bases its argument on such universality. While informative in many respects, one should be reminded that all religions are not the same; thus, their cultural effects on traditional societies cannot be viewed as universal. In this philosophical thought, the traditional society is a spiritual community, and spirituality resides in every aspect of the traditional human life.\textsuperscript{30} As such, writings of this circle of scholars are laden with symbolism and allegorical notions. They reason that the dissemination of Sufi mysticism (i.e., Islamic mysticism) greatly impacted the Muslim world, meaning that it was not limited to a small number of spiritual sages. Instead, it impacted nearly every aspect of human life at the time, and particularly the arts and architecture. I agree with their argument in principle, but it is not clear to what extent mysticism was present in their lives and how it impacted architecture. The fact that not many available sources from the past discussed spirituality in the way we (post-modern academics) think it should be addressed (given its importance) should not be equated with its insignificance. Quite the contrary—the fact that mysticism was an integral part of thought and life reduced the need to make it a subject of study. However, Sufi mystic writers such as Sana'i (d. 1131?), Rumi (1207-1273), or Jami (1414-1492) did produce poetry and prose that are filled with mystical interpretations of the world. The views they expressed in their poetry reflected the art of the time as well as the mystical ethos of their epoch. That is why in perennial philosophy’s view, a merely historical approach based on evidential sources does not lead to an in-depth understanding of traditional values, and to the truth. The depth of the beliefs of traditional Islamic society of the 14\textsuperscript{th} - 16\textsuperscript{th} centuries is accessible only if one can penetrate inside this universe. While this argument is true in nature, to make it accessible to our time would require starting from the present time, not adopting universality of truths as defining elements of

\textsuperscript{29} Burkhartd’s views associated with Essentialism has been widely rejected. Therefore, this study does not use that approach as a method of study.

\textsuperscript{30} I agree with this conception of the traditional world as being mystical at its own period. However, for today’s world it might not be a true case. Additionally, it does not seem to suggest a specific method for study of that world.
our time. Additionally, the present study has hopefully avoided a focus on universals, and instead has discovered the particularities and nuances that are critical to an in-depth understanding of issues. This has meant distancing from essentialism and adopting an interpretive method.

In reviewing both suggested approaches, I can see the proper methodology has elements of both. Due to the nature of the study, which looks into the in-between as a coherent realm of its own, it seems that the duality that Akkach has set up does not necessarily fit this vision, while the study requiring both accounts. On the one hand, one must have a contextualized understanding of the notion of imagination, drawing, and window as interconnected levels of in-between-ness in architecture. This is particularly imperative in studying the Islamic conception of the worldly imagination—\textit{mundus imaginalis}—and its association with the visual culture and architecture of the time. On the other hand, by committing itself to the notion of in-between, this study encourages—and to some degree requires—a suspension between its two sides, the rigid rationality of analytical studies and the transmutation of mytho-poetics.

Therefore, in terms of academic discourse the present study, by incorporating the historico-cultural and mytho-poetics approaches into one unified realm, employs hermeneutical approach as its main vehicle. In this instance the two approaches are not seen as competing paradigms, but rather existing on a continuum from the phenomenal to the spiritual. This principle comprises the structure of the entire dissertation and each of its parts. Each individual part begins with a discussion supported by historical evidence, providing background insights into the subject of investigation. It then moves along that continuum toward contemplative discussions. Hermeneutics allows a better reading of historical artifacts relative to their context, as well as make the values of the traditional world accessible to today. Hermeneutics here is understood broadly: the more restrictive sense of historical textual interpretation (e.g. Koran, treatises, poems, etc.), to the visual interpretation, which includes analysis of historical paintings and drawings, and also my own drawings as contemplative exercises.
The qualitative nature of the study, while admitting the somewhat idiosyncratic involvement of its author, also calls for similar participation of its reader. In effect, the premise of associating Architectural Drawing and Imaginative Knowledge inherent in this study is divulged once the reader starts imaginatively participating in the words and images of the study. It is only under such conditions that the present study can make contribution, providing both quasi-objective contextualized knowledge and quasi-subjective experiential realization that alludes to a spectrum of understanding from reason to experience.

The dissertation, responding to the three identified levels of in-between (i.e., mode of ontological being, mode of representational being, mode of physical being) is structured in three major parts. These parts are conceptually interrelated and hierarchical. The order of the study demonstrates a move from conceptual, to imagery, to physical modes of in-between. This order also accords to the three realms of intellect, imagination, and senses—a triplicity of interrelated worlds in pre-modern Islam.

Part One begins with a brief overview of the notion of imagination as embraced by Islamic scholastics. It then moves to the central theme, mundus imaginalis, or the imaginal world, in Islamic mysticism. The first part concludes with a discussion of the poetics of the imaginal, including the transformative nature of the imaginal in relation to beauty, making, and knowledge in the context of visual representation. The significance of the imaginal as an in-between, yet ontologically valid world, will be discussed in relation to the visual representation. The imaginal world, defined as a subtle world of existence, subject to various intellectual and material

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31 This is the case for all qualitative research. As the former “data” (in quantitative measures) is now replaced by individual’s interpretations, the outcome necessarily bears subjective projections of the author. If in positivistic paradigm, measures of “internal validity” and “external validity” were at work to control the consistency and relevance of research, in interpretive, hermeneutical, and poststructural qualitative inquiry the alternative criteria for trustworthiness is term “authenticity.” In such narrative based writings, the author is understood as part of the text, therefore, recognizing the author’s context becomes an essential step towards a comprehensive understanding of the text. Some qualitative research authorities suggest including a “reflexivity” section or note prior to the main text in order to inform the reader about the authors background and biases. Together with such cautionary and informing measures, efforts to make a narrative as accessible to the reader as possible, as well as the potential impact of the study on the reader, is what constitutes the authenticity of a study. The author and reader, however, remain part of the text. This is also true in case of design; where the designer and design cannot be separated. For discussions on the qualitative research, authenticity, and reflexivity see: Denzin, Norman K. & Lincoln, Yvonna S. 2005.
interpretations, can be found in the world of drawing, a subtle world mediating between the invisible and the tangible. This level of the study corresponds to the ontological level of the in-between.

Part Two corresponds to the representational level of the in-between and looks into the architectural drawings of the Islamic world, starting with a review of the status of architecture as an intermediary between ideal and real worlds. This second part then discusses how the conception and execution of Islamic geometric drawings (as a mode of representation) of the time, known as *girih*, incorporated imagination at various levels—and in so doing was able to bring out consciousness and knowledge of the self and world. Understanding this mode of representation, which also alludes to a mode of thinking and making, is central to this part of the dissertation. It argues that the *girih* mode is that of *mundus imaginalis*; thereby inviting the individual to inhabit it in the imaginal. Part Two corresponds to the representational level of the in-between.

In Part Three, a specific type of window whose architecture is defined by its geometric pattern, is studied as material instantiation of the *girih* mode. In order to further connect this part to the main argument of the dissertation (the in-between-ness of architectural drawing and imaginative knowledge), and not merely studying a material manifestation of the *girih* mode, I chose my own drawings as a tool to (re)create the argument in a visual mode. My drawings are intended to serve as co-existent to the manuscript. These drawings attempt to examine the window under study as a literal in-between (i.e., between inside and outside), as well as the imaginal in-between (i.e., between the visible and invisible worlds). The visual language employed in my drawings distances them from that of the *girih*. However, I find it helpful in the sense that it responds to the hermeneutical nature of the study method. It is my hope that this also helps the reader-viewer-imaginer inhabit the drawings and apprehend their imaginal nature as they become subtle existences that are expressive and invite the individual to see other readings beyond the surface of the drawings. A reflection on the in-between-ness of the *girih* drawing in particular, and architectural drawings in general, serving as an anagogical window to the imaginal world, concludes the discussion.
1: BETWEEN SENSE AND IMAGINATION

The notion of the imagination, magical intermediary between thought and being, incarnation of thought in image and presence of the image in being, is a conception of utmost importance, which plays a leading role in the philosophy of the Renaissance and which we meet with again in the philosophy of Romanticism.

-Alexandre Koyre ¹

Preamble on Imagination

During the medieval and Renaissance periods, the notion of imagination was a central theme to the philosophical schools of Islam. The imagination was regarded as a perceptive organ complementary to reason and the senses, sometimes recognized as a distinct ontological realm. In philosophical terms, this perceptive faculty mediated between reason and the senses, and was capable of introducing the human to higher levels of transcendental understanding.

Worldly imagination², or imagination as a realm of existence independent of the realm of material and the individual, has been discussed in a variety of ways throughout Islamic thought, whose metaphysics reached a culmination in the writings of Islamic mystics. Islamic mysticism, known as the Sufi tradition—whose leading figures can sometimes be associated with orthodox theology and philosophy—discusses the world of imagination as a realm of being, which is a notion that I will be discussing herein. It is within such a context of mysticism that the idea of mundus imaginalis or the imaginal world was first introduced and elaborated in the mid-13th century. This notion came to prominence in the 15th and 16th centuries and beyond in the writings and representational arts of the eastern Islamic scholars. The imaginal world, which is the subject of this section, is an ontologically real world linked to the essence of an individual. In religious terms, it is the realm in which angels take form and corporeal beings become spiritualized. It is

² I have borrowed this phrase from Brann. E 1992.
also a realm of very subtle matter, *spiritus*. Henry Corbin, a French Heideggerian philosopher of Islamic thought, (1998) provides insight on the imagination as magical production of an image, and the image as “magical body or mental body” as incarnation of the thought and will of the soul.

In more general terms, the imaginal world is the realm of subconscious human dreaming on the one hand, and active, awakened imagination on the other hand. It is within this world that human imagination exceeds its psychological function and gains noetic value with cosmological attributes. These multiple realms of imagination and the world of the imaginal, with their potentially powerful windows capable of bringing true knowledge of the divine and the invisible to the human, immensely impacted Islamic art and architecture. The beginning notes in the of *Risala Mimariya*, an early 17th century Ottoman architectural treatise, is an indication of the significance of invisible knowledge:

> Let there be endless thanks and numberless praises of that God who created men, who opened the door of the palace of wisdom, who in accordance with the command “Be! And it is. . . .”

The divine knowledge as a palace of wisdom is opened to the human by a door that is accessible through worldly imagination, which represents an idea that has been emphasized by nearly all mystics and is compared to creative knowledge of the divine.

Imagination, in its psychological or cosmological stages, relates to architecture on various levels. One is the level of inception, the stage in which architecture is conceived by the architect. Another level—when architecture is absorbed—represents the process by which architectural space is understood by the inhabitant. Both of these levels are vitally present in the architectural representation, as both a process and a final artifact. In the context of this study in which geometric drawings are discussed, it is essential to contextualize our discussion of imagination with respect to the striking parallels that exist between major historical shifts in Islamic theology and the visual culture of the Islamic world as seen in its geometric drawings. These are notions that will be developed in the following section. It is also

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3 Efendi, C. 1987: 18. Translated by Crane H. this piece is found on [2v] of the original manuscript.
important to trace the influence of Western thought on Islamic philosophy and sciences as they both directly and indirectly influenced the geometric mode of representation, known as *girih*, which is the subject of the second part of this study. This concept is also known to the West as “arabesque,” a mode of representation (i.e., visual pattern) that widely shaped Islamic visual identity despite its historical and geographical varieties.\(^4\)

Generally regarded as the “Golden Age” of Islamic philosophy and sciences, the 9\(^{th}\)-12\(^{th}\) centuries are characterized by scholars who remarkably reconciled and developed the hitherto ancient Greek sciences and philosophy in the Islamic realm. It was during this time that a centralized scholarly institution known as *Bayt al-hikmat*\(^5\) literally the “House of Wisdom,” came into being with the aim of translating Greek and Persian texts to Arabic. During this period, Islamic philosophers sought to reconcile Plato and Aristotle in their own religious-oriented philosophy. Plato’s theory of forms, in which forms such as the beautiful were introduced prior to the object, were weighed against Aristotle’s rejection of that theory, who argued that forms and objects were intertwined—a dichotomy that seemed to later reappear in the works of many Islamic thinkers. Discussions on the notion of imagination and its intermediary and meditative functions during this period were highly influenced by the perspectives of Plato and Aristotle through Neoplatonism.\(^6\) Following is a brief review of the evolution of the imagination in Islamic philosophy from early Islamic thinkers, prior to the prominent mysticism of the 13\(^{th}\) and 16\(^{th}\), who elevated the role of imagination to a cosmic level.

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\(^4\) Emergence of the geometric mode of *girih* is attributed to the 10\(^{th}\) century and most likely in Baghdad. It was an era when Islamic thought was creatively being shaped with major influences from ancient Greek. Abbasid caliphate’s inauguration with their new capital moved from Damascus to Baghdad, in the mid of 8\(^{th}\) century marked a beginning of a flowering period of Islamic philosophy and sciences that lasted for about three centuries. Since the emergence of the geometric mode of design and drawing and philosophical discussions on the notion of imagination both started in one geographical and temporal horizon, the present study aim at a study of both of them in their historical context. *Girih* will be discussed in greater detail in Part Two.

\(^5\) It is also referred as *dar al-hikma*. As both *bayt* and *dar* in Arabic language mean house.

\(^6\) Neoplatonism, integrating philosophical thinking with religion, is considered one of the major intellectual loci to embrace imagination as a noetic faculty. Plotinus, who is known as one of the early figures who returned to Plato’s teachings, made analogy between imagination and reflecting mirrors, an analogy that long permeated in both Western and Islamic traditions.
Imagination: Intermediary Faculty

The intermediary role of imagination was discussed by nearly all prominent early Islamic philosophers since the 9th century, all of whom shared the fundamental belief that imagination belongs to the internal faculties of the soul. I will focus on one (Ibn Arabi) in the next section in detail. This section provides an overview of the development of the idea of imagination prior to that time.

Al-Kindi (801-873) was a leader among the early scholars of this era who spoke of imagination. He was active with other scholars who engaged in editing and paraphrasing translations of Aristotelian and Neoplatonic texts and commentaries into Arabic. Ivry (2008) considers that Al-Kindi’s views on what we call “psychology” seem to be mainly formed by an “acquaintance with paraphrases made of *De anima*, the Theology of Aristotle, Plotinus’ *Enneads*, and the Book on the Pure Good, an abridgement of Proclus’ *Elements of Theology*.”7 His treatise *On Dream and Sleep* seems to have been influenced by Aristotle’s *Parva Naturalis*, three linked treatises *On Sleep*, *On Dreams*, and *On Prophecy in Sleep*. Al-Kindi’s account in his treatise follows Aristotle by “invoking the same physiological processes to explain sleep.”8 However it departs from Aristotle in that he recognized the brain as the “the primary organ” of the body—not the heart. Following Aristotle, al-Kindi associated dreams with sleep. Adamson (2011) reports on al-Kindi’s belief “that dreams occur when we are sleeping because the senses are no longer active, and the imagination has free rein to conjure up forms on its own.”9 Unlike Aristotle who seems to be skeptical about prophetic dreams, al-Kindi is enthusiastic about them. According to Adamson, al-Kindi even explained “the various types of dream, with their accuracy determined by the physical state of the brain. But despite the physiological aspects of al-Kindi’s account, the fundamental explanatory work is done by the incorporeal soul, which ‘announces’ its visions of the future to the imagination.”10 For al-Kindi, the soul was immortal and maintained its independence from the body. In his *magnum opus*, On

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8 Adamson, P. 2007: 138-139.
10 Ibid.
First Philosophy, he highlighted the mechanics of perception as advancing from the sensible object (via the sense organs) to the faculty of “common sense,” which to him is a combination of the imagination and memory. He mentions the process of sensory perception: “It [sensory perception] is that the forms of which are established in the imagination, which conveys them to the memory; and it [the sensible object] is represented and portrayed in the soul of the living being.” Later he articulated the function of the imagination as both “abstracting and presenting images apart from their matter.” Al-Kindi’s interpretation of imagination rests in both the psychological and the physiological levels. His idea of the rational soul and its role in prophetic dreams—even though it opens up the possibility of an existing realm of imaginal beings—does not seem to have portrayed a comprehensive framework of a theory of imagination. However, it should be noted that al-Kindi’s observations on imagination as a power to add potentiality to the world, which connects him to later mystics’ and even contemporary thinker’s accounts of imagination, is the “worldmaking” attribute of imagination:

As it is possible through the imagination for something to be continually added to the body of the universe, if we imagine something greater than it, the continually something greater than that-there being no limit to addition as a possibility the body of the universe is potentially infinite, since potentiality is nothing other than the possibility that the thing said to be in potentiality will occur.

Aside from his work on the perceptual and psychological role of the imagination, al-Kindi’s significant contribution to the notion of imagination is found in relating imagination to potentiality and the possibility of creating things. This is a notion well-familiar to architectural design in the sense that imagination is in search of potentialities within materials and things and possibilities for their occurrence in different appearances, an unending unfolding of architectural possibilities.

Al-Farabi (870-950), who was known as “the Second Teacher” after Aristotle, was

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13 Al-Kindi, 1974: 70.
highly influenced by Aristotelian thought. Unlike al-Kindi, he considered the heart as the “ruling organ” of the body, which was assisted by the brain and other organs. Ivry explains that in al-Farabi’s view, “The heart provides the innate heat that is required by the nutritive faculty, senses and imagination.”

14 Al-Farabi, akin to Neoplatonic thought, recognizes three hierarchical cognitive realms of intellect, imagination, and sensation, which are concomitant with each other. Therefore, for example, while sensation could immediately react negatively or positively to some precept, the imaginative and intellectual faculties in turn would have an affective reaction, resulting in a particular course of action. Al-Farabi distinguished between animals’ automatic affective reactions and humans’ conscious and considerate responses, which come from their rational faculty. He linked a human’s imagination with the notion of “choice.” In his view, the imaginative faculty (Al-quwwah al-mutakhayyilah) has the power to modify sensible forms and present them to the intellect. Ivry also reports al-Farabi’s portrayal of the imaginative faculty as “having a mimetic capability, ‘imitating’ the sensible forms previously received yet not present until recalled to mind. This imitative ability extends over all the other faculties of the soul, including the intelligible notions of the rational faculty.”

15 This mimetic capability of human imagination plays a significant role in the visual culture of the Islamic world. This is particularly applicable to the development of Islamic geometric design in which intelligible concepts are embodied in sensible forms. Ivry indicated “al-Farabi adapts this originally Aristotelian idea to prophecy as well as to lesser forms of divination, asserting that an individual imagination can receive intelligible ideas directly from the Agent Intellect, converting them to imaginative representations.”

16 According to Ivry, al-Farabi believed “the Agent Intellect emanates particular as well as universal intelligibles upon a given individual, expressing present as well as future events, and, for the prophet, particularized knowledge of eternal truths, “things divine” (ashyau ilahiyah).”

17 Compared to Al-Kind’s portrayal of imagination, al-Farabi provides a more complete system in which

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15 Of these faculties, al-Farabi considers the Intellect possessing the highest rank. His notion of Active Intellect (aql fa’al) is a universal mode of intellect independent from the individual intellect with the possibility of the latter to participate in the former.
16 Ivry, A. 2008.
17 Ibid.
18 Ibid.
imagination engages other faculties of soul, particularly the intellect, and thereby the intellect’s autonomous status and divine attributes.

Ibn Sina, or Avicenna, (980-1037) among the circle of the 9th-12th century theologians and philosophers elucidated the most complete portrayal of imagination. Ibn Sina was also familiar with Ikhwan al-Safa (the Brethren of Purity), a group of anonymous scholars of the 9th and 10th centuries with strong associations with Aristotle and Neoplatonism, whose metaphysics are built upon Aristotle and Plotinus. The simple language of their writings, while useful for theologians and scholars, was particularly significant because it made their epistles accessible to the less-literate, thereby broadly disseminating it among Muslim society. Their interpretations, which paraphrase Pythagorean perspectives on the mind and purifying role of geometry and its capacity to associate human understanding to cosmological truths, parallels al-Farabi’s imagination in mediating between the intelligible and the sensible forms. Their wide range of writings, including on music (following al-Farabi’s treatise on music) and arts and crafts, provided the early Muslim world with a wealth of theoretical documentation that remained influential long after their era. Additionally, their association with Islamic mysticism provided Muslim artisanry and architecture with symbolic interpretations. It was in this era that Ibn Sina developed his cosmological perspective, which was akin to the emanation theories of Neoplatonism. In many ways, the Brethren’s cosmology echoed earlier emanationist worldviews of Arab philosophers including al-Kindi and al-Farabi. This perspective regarded the universe’s ultimate cause as pure light, and as such resembles the writings of al-Farabi. However, unlike al-Farabi, Ibn Sina distances himself from Aristotle and moved toward Plato, advocating an independent, incorporeal, and ultimately immortal status for human soul. The soul, then, originates from a divine source. For Ibn Sina, the soul is an independent intelligent subject. Ibn Sina’s depiction of a self-conscious, receptive, and cogitative soul also subtly interacts with the body. Ivry informs us of that in Ibn Sina’s philosophical view, the soul is a subtle organ that connects to bodily pleasure or pain: “Depending primarily on the amount of knowledge it accumulated, but also on the life the person lived, with its virtues or vices, the immortal soul experiences continuous pleasure or pain.”19 In this manner,

both in philosophical and theological terms, Ibn Sina’s theory extends beyond Aristotle, which he achieved by combining Aristotelian and Neoplatonic teachings. For him, the imagination and all its derivations belongs to the internal senses of the soul.\(^{20}\)

Ibn Sina distinguished between the faculty of common sense and the imaginative faculty by locating the internal senses in three ventricles of the brain, “placing two in each ventricle, with receptive and retentive capacities respectively.”\(^{21}\), and within the imaginative faculty he identified two types of imagination. Ivry explains that for Ibn Sina, “the sensible forms that the common sense receives and unifies are then transmitted to the imaginative faculty”\(^{22}\) namely quwwa musawwira, or khayal, which retains these sensible forms fully. This is an “informing” or “formative” imagination, which along with the faculty of “common sense,” comprises the first pair of faculties of the front ventricle of the brain. The middle ventricle, the location of the next pair of internal senses, comprises “a novel faculty of estimation” ... , wahm in Arabic, as well as a second, chameleon-type faculty. It functions both imaginatively (in animals and humans), and rationally (in humans alone). As another aspect of the imaginative faculty, Ibn Sina referred to it simply al-mutakhayyilah (the imagination), but due to its expanded function it is known as the “compositive imagination.” However, when this faculty deals with specific, materially-based concepts, Avicenna named it quwwah mufakkirah or a thinking, “cogitative” faculty.\(^{23}\) This is a “rational imagination” and Ibn Sina attributed a spiritual capacity to it that is “cultivated in the arts, sciences and noble actions.”\(^{24}\) Ibn Sina’s portrayal of imagination is multifold: a perceptive faculty, a form-giving or form-recognizing faculty, a composing agent, and intellection and cogitative power. Ibn Sina’s portrayal of imagination is close to contemporary conceptions of the imaginative power as a faculty of mind whose function extends from sensory perception to

\(^{20}\) Ivry also continues on this subject: “Avicenna has severed the natural link between imagination and intellection, in order to preserve the immaterial and immortal nature of the soul. It is dependent on the Agent Intellect entirely, with only the soul’s independent substantiality separating it from being totally absorbed in it.” Ibid.

\(^{21}\) Ibid. Ibn Sina was also a prominent scientist and physician who is also known for his groundbreaking works on medicine in early Islamic world. His familiarity with brain ventricles comes from his field of medicine. His book “The Canon of Medicine” was taught to teach physicians for centuries after his death.

\(^{22}\) Ivry, A. 2008.

\(^{23}\) Ibid.

rational thinking.

Al-Ghazali (1055-1111), one of the most influential Sunni theologians and philosophers, was known for his association with mild association with mysticism. His “approach to resolving apparent contradictions between reason and revelation was accepted by almost all later Muslim theologians” later influenced Western thinkers as evidenced in the works of Ibn Rushd (Averroes) and others. Al-Ghazali portrayed a mystic worldview in which the source of creation is the light of God, a perspective that later dominated the aesthetics of Islamic visual representation. He considered the heart to be a source of understanding and home for the soul and the internal senses through moral practice: “The aim of moral discipline is to purify the heart from the rust of passion and resentment, till, like a clean mirror, it reflects the light of God.” Similar to later mystics and Sufis he distinguished between the invisible and visible worlds, thereby identifying inner (batin) and outer (zahir) kinds of vision for the human and gives authority to the inner vision:

The inner vision is stronger than the outer one, the "heart" keener in perception than the eye and the beauty of the objects perceived with the "reason" is greater than the beauty of the outer forms which present themselves to the eye. Hence the pleasure of the "heart" over the exalted divine objects which it sees and which are too lofty to be perceived by the senses must necessarily be more perfect and greater, and the inclination of sound disposition and reason toward them must be stronger. . . . He who lacks the inner vision cannot perceive the inner form and cannot derive pleasure from it, love it and incline toward it.

The domain of the soul, therefore, represents the realm where inner vision is closely associated with inner senses—in other words, where imaginative faculty resides. Like others, al-Ghazali considered imagination as an intermediary between the senses and discursive reason. He also argued that the imagination represents the glue that holds together what has been collected by reason. He discussed that imagination, along with the other two faculties, has the power to veil and unveil the

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light of truth, a discussion that is articulated in his book, “The Niches of Lights” 
(*mishkat al-anwar*). There, he mentions of “five levels of the luminous human spirits,” 
as stages of human consciousness and understanding. Those spirits are 
sensible, imaginal, rational, reflective and prophetic spirits. Al-Ghazali argues that 
these five spirits lead to manifesting things, a perspective that argues for the 
imaginal as realm of existence and consciousness. He explains the imaginal spirit as 
following:

As for the imaginal spirit, we find that it has three characteristics: First is that 
it derives from the clay of the dense low world, because the imaginalized 
thing possesses measure [and] shape, [has] specified and confined direction, 
and is near or far relative to the one who does the imagining. A characteristic 
of a dense thing that is described by the attributes of bodies is that it veils 
the pure rational lights, which are incomparable with being described in 
terms of directions, measures, nearness, and farness. The second 
characteristic is that when this dense imagination is purified, refined, 
polished, and organized, it becomes parallel to the rational meanings and 
points toward their lights. It does not obstruct the light that radiates from 
the meanings. The third characteristic is that, at the beginning, imagination 
is much needed, because through it one can organize knowledge so that 
knowledge will not be agitated, shaken up, and scattered with a scattering 
that eliminates the organization. What a wonderful help are the imaginal 
similitudes for rational knowledge!

Al-Ghazali’s description of the characteristics of the imaginal spirit (also regarded as 
imaginal existent) is key to developing an understanding of the imaginal as an 
intermediary realm of subtle bodies. His description of “dense imagination” 
mediating between dense lower material world and rational meaning and 
knowledge is of significance to this discussion because the imaginal existence also.

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28 Al-Ghazali, however, sometimes warns on the erroneous phantasy, which is an indication of 
distinguishing between fantasy and true imagination, a warning that Ibn Arabi discusses in detail.
29 Al-Ghazali mentions: “Once you have recognized these five spirits, know that, taken together, they 
are lights, because they make many types of existent things manifest- the sensory and imaginal among 
lends itself to domains of visible representations by holding material attributes such as direction, measures, etc., while leading up to rational knowledge.

Al-Ghazali’s mystic view led him to be one of the first Islamic philosophers to conceptualize imagination as an ontological realm, a particular place of being. His indication of “imaginalized thing” as holding attributes of the material world is fundamental. In this view, the imagination creates a world of its own which is also closely related to the material world. Muslim thinkers in this period stressed the importance of an individual’s internal faculties, and privileged the essential role of the internal faculties over the external faculties (physical senses) in obtaining understanding and knowledge.31 As such, the soul became the active perceptive and creative agent, a complementary two-way process at work in the visual culture. Belonging to the realm of the internal senses, imagination was widely recognized as a unique human faculty that could mediate between sense and reason. Named and categorized differently, the imagination remained central to the human ability to recognize one’s self in the world. At a minimum, the imagination could be used to modify and recreate images collected by memory and present them to the intellect. It is commonly accepted that “the participation of internal senses such as imagination, cogitation, and memory in the processes of artistic creation and aesthetic perception endowed these activities with an intellectual dimension.”32

The post-al-Ghazalian Islamic world was increasingly engaged with mysticism, which was characterized by a heightened interest in developing a more direct relationship with the ultimate reality—while at the same time admitting the limitations of reason to capture reality. Al-Ghazali’s insights ushered an era that began to incorporate geometric interpretations to the Islamic conception of unity in diversity with the Light of God at the center. After al-Ghazali, imagination evolved from being a perceptive and cognitive human faculty and became a unique agent capable of creating a world of “imaginalized things” with shape, size, direction, distance, etc.—

31 Ibn Rush (Averroes, 1126-1198), a Muslim philosopher contemporaneous to Ibn Arabi, held similar views about imagination with his predecessors. Ibn Rush believed that imagination was a rational faculty capable of making sense of the faculties of the soul. However, he tended to stay on the rational side while respecting mysticism. Ibn Rush was also a friend of Ibn Arabi’s father. Ibn Rush who had heard about the visionary experiences of the young Ibn Arabi asked for a meeting with him. Ibn Arabi captures the meeting in a short excerpt in which he attempts to distinguish his approach to the truth with that of Ibn Rush.
while still able to express meaning. These subtle matters held attributes of the physical world while not possessing material substance. The significance of the imagination in relation to knowledge is that the imaginalized similitudes (al-mithalat al-khayaliyah) become essential to rational knowledge. Al-Ghazali’s use of term al-mithal, denoting image, exemplar and substance, suggests that the rational knowledge is nurtured by the al-mithal, a notion that Ibn Arabi’s philosophy stresses.

Ibn Arabi (1165–1240), was one of the greatest of all Muslim philosophers, Sufis, and theosophers. Ibn Arabi spoke of philosophy in the broadest sense and not purely as the discipline of falsafa, whose outstanding pre-modern representatives are traced to Mulla Sadra (1572, 1640), who introduced his mystic writings during this era. Chittick informs us that while “Western scholarship and much of the later Islamic tradition have classified Ibn Arabi as a Sufi,” he himself did not. Imagination played a major role in Ibn Arabi’s writings, which over time significantly impacted Islamic art and architecture. Ibn Arabi is thought to be the first to collect all the hitherto theosophical teachings and put them in written documents. In this regard, Seyed Hossein Nasr, contemporary Islamic philosopher, considers Ibn Arabi as initiator of the theoretical mysticism or theosophy (irfan nazari). This also suggests the persistence of mystical thought through time, while continuing to experience change and evolution. For example, some four centuries later we see Mulla Sadra articulating and disseminating Ibn Arabi’s theory of mundus imaginalis. While for some contemporary scholars this opens up the possibility of taking an ahistorical account in regards to studying mystical views on the subject of imagination, it is the interpretive nature of the mundus imaginalis and the mystic view that sustains it as a valid and authentic domain for informing our contemporary time. Ibn Arabi’s

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33 Mulla Sadra is one of the prominent philosophers and theosophers of the 17th century who wrote commentaries on mundus imaginalis.

34 Chittick, William, “Ibn Arabi”, The Stanford Encyclopedia of Philosophy (Fall 2008 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/fall2008/entries/ibn-arabi/>. Chittick, who worked his PhD dissertation on a translation and commentary of one of Ibn Arabi treatises, devoted much of his research studying and translating Ibn Arabi’s writings into English. On the existing literature on Ibn Arabi Chittick, here, mentioned “Not until books by Henry Corbin (1958) and Toshihiko Izutsu (1966) was he recognized as an extraordinarily broad-ranging and highly original thinker with much to contribute to the world of philosophy.” … “More recently, scholars have begun to look at this work (which will fill an estimated 15,000 pages in its modern edition), but less than ten percent of it has been translated into Western languages and even this has not been explained and interpreted adequately.”
relevance to our time is the hermeneutics he promotes through his theory of imagination. Some scholars have compared the Sufism of Ibn Arabi and the post-structural (deconstruction) project of Derrida, in which they both recognized shackles of reason and took opposition views towards rational thought. Ibn Arabi’s philosophical project is vast and multifaceted; however, his hermeneutics and theory of imagination, introducing a “triplicity of worlds,” overcomes the world of duality (e.g. Cartesian dualism). Recognition of this triplicity provides essential insights for the creative act of design.

Mundus Imaginalis | The Imaginal World

In devising his divine theory, Ibn Arabi identified that between the Unseen (ghayb) and the Visible (shahada) exists a third world of the in-between: alam al-khayal, or the world of the imagination. This intermediary world has been discussed by a number of other Islamic mystic Sufis and theosophers—Suhrwardi and Mulla Sadra (his name: Sadr al-Din Shirazi), to name two—for its unique cognitive consciousness in religious terms. They all attested to the trustworthiness of al-khayal (imagination) as a contemplative power for reaching a higher level of consciousness, in contrast to the type of “everyday imagination” used to enhance mental capacities for creating images or fantasy. These two interpretations of imagination suggest different directions for design.

Distinguishing between the imaginary as mere false fantasy and the directed imagination, Henry Corbin coined the neologism “imaginal” to address the true nature of this type of imagination and realm of being, referring to this world as “mundus imaginalis”:

…we usually speak of the imaginary as the unreal, the utopian, this must contain the symptom of something. In contrast to this something, we may examine briefly together the order of reality that I designate as mundus imaginalis, and what our theosophers in Islam designate as the "eighth

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climate”; we will then examine the organ that perceives this reality, namely, the imaginative consciousness, the cognitive Imagination …

Corbin’s interpretation of Ibn-Arabi’s idea of imagination surpasses contemporary culture and is associated more with Renaissance thinkers who regarded imagination as an ontological level of being of the spiritus. In further articulating his views, Corbin clarifies the cognitive function of mundus imaginalis:

Let us be certain that we understand, here again, that this is not a matter simply of what the language of our time calls an imagination, but of a vision that is Imaginatio vera. And it is to this Imaginatio vera that we must attribute a noetic or plenary cognitive value. If we are no longer capable of speaking about the imagination except as “fantasy,” if we cannot utilize it or tolerate it except as such, it is perhaps because we have forgotten the norms and the rules and the “axial ordination” that are responsible for the cognitive function of the imaginative power (the function that I have sometimes designated as imaginary).

Drawing on the Koran, which recognizes a realm between the Unseen and the Visible, or the world of divinity and the world of bodies—or in philosophical terms, the intelligible and the sensible realms—Ibn Arabi recognizes the in-between realm of imagination and through his writings brings out the full implications of this world “which in one respect is unseen, spiritual, and intelligible, and in another respect is visible, corporeal, and sensible.”

Mundus imaginalis is the second in the triplicity of worlds. The first is called mulk (alam hissi), the sensory world, which is the physical or sensory—the world of phenomena. The second category is malakut (alam al-khayal), the world of imagination or mundus imaginalis, which is a “suprasensory” world of the Soul (also known as the Soul-Angel). The third world is Jabarut (alam aqli), the world of the intellect, which is the world of pure archangelic Intelligence.

Ibn Arabi describes the in-between world of suprasensory “subtle bodies.” This is precisely the mundus imaginalis of Corbin, “where spiritual beings are corporealized,

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37 Corbin, H. 1976.
38 Chittick, W. 2008.
39 malakut is another name to denote mundus imaginalis.
as when Gabriel appeared in human form to the Virgin Mary; and where corporeal beings are spiritualized.\footnote{Chittick, W. 2008.} It is also in this space that the Prophet Muhammad’s Night Journey (miraj) happened, when he ascended to alam al-malakut (mundus imaginalis) and met Gabriel. A page from the Mirajnama (Book on the Ascension of the Prophet) from early 14th century portrays Gabriel presenting the city of Jerusalem in model form (Fig. 1.1). This illustration is one of the earliest indications of the use of models in the Islamic world. In the painting, the model of Jerusalem is portrayed with its walls, river, trees, and buildings sitting on the city’s topographical landform. It is a colored model that seems to be built on a carved plaque of stone. While the city’s details suggest a non-abstract language for the model craft (i.e., the proportions and colors seem to be realistically rendered), the small scale of the model alludes to abstract-ness of the object compared to Jerusalem. Nevertheless, since the entire illuminated portrayal happens in mundus imaginalis, one can expect the model, like the angel, to be an imaginal subtle existence.

Fig. 1.1 Left: Miniature Painting of the Prophet’s Night Journey. A Page from Mirajnama (now lost) from early 14th century (Tabriz, Iran). Right: Close up view of the imaginal Jerusalem. Topkapi Saray Muzesi, 2154, fol.107 a.

Recognized as a plane of reality by Islamic philosophers, mundus imaginalis “is a real, external realm … more real than the visible, sensible, physical realm, but less real than the invisible, intelligible, spiritual realm.” \footnote{Chittick, W. 2008.} It is where things possess substance
(i.e., immaterial substratum) but not matter; in other words, it is a realm of very subtle matter. To further understand subtle matter or body, we need to unfold its meaning etymologically using the examples given by mystics.

The term “subtle body” (jism-i latif), although not a Koranic term, seems to have arisen in the 10th century in Islamic discourse. The term latif in Arabic means “gentle,” “sensitive” and “subtle.” The notions of the subtle body and the imaginal bodies (jism-i mithali) are closely associated and have been used interchangeably. In Sufi terminology the word latifa is often attributed to a nonmaterial component of the individual “which can be influenced or ‘awakened’ through spiritual practices.” This suggests that the subtle body or matter is the self’s sensitive cogitative agent, a common conception of the notion of “subtle body” in most esoteric philosophies.

This awakening aspect of the subtle body echoes that of the imaginal similitudes of al-Ghazali with respect to rational knowledge. Imaginal similitudes in this sense are considered as subtle matter, sensitive to and capable of participating in spiritual practices, as exemplified in the Jerusalem model.

The Muslim mystical theosophical view asserts that the three worlds or categories of universe are interconnected. Corbin indicates that each of these three realms also calls for appropriate faculties of perception: “To these three universes correspond three organs of knowledge: the senses, the imagination, and the intellect, a triad to which corresponds the triad of anthropology: body, soul, spirit.” Residing between the worlds of sensory and the pure intellect, mundus imaginalis is described further as “the world of ‘supersensory sensibility,’ of the subtle magical body, the world in which spirits are materialized and bodies spiritualized.” This is the world of imaginal

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43 Subtle body (jism-i latif) has been also referred to a body that does not obstruct the light (and particularly that of the extra-worldly light). See: Dehkhoda Persian Dictionary, Online Edition.
45 This level is also referred to as human’s astral body, and is described as one that exists parallel to the physical body. Contemporary theosophy of Blavatsky’s, which is associated with Eastern esoteric philosophies, also speaks of human’s astral body. In her constitution the subtle bodies in a human being are: Ethereal body (vehicle of prana), Emotional or astral body (vehicle of desires and emotions), Mental body (vehicle of the concrete or lower mind), Causal body (vehicle of the abstract or higher mind).
46 Corbin, H. 1976. Corbin continues: “In considering these forms, we realize immediately that we are no longer reduced to the dilemma of thought and extension, to the schema of a cosmology and a gnoseology limited to the empirical world and the world of abstract understanding.” Corbin also explains: “These worlds also possess three associated Forms of Being and Knowledge: (1) Sensible Forms (sowar hissiya), those which fall under sense perception, (2) the Imaginal Forms (sowar mithaliya), and (3) the Intellectual Forms (sowar aqliya). See Corbin, H. 1989: ix.
bodies over which the imagination holds sway—"that the imagination can produce effects so real that they can “mold” the imagining subject, and the imagination “casts” man in the form (the mental body) that has imagined." Corbin mentions that *mundus imaginalis* is a "world as ontologically real as the world of the senses and the world of the intellect." *Mundus imaginalis* commands a complete network of notions appropriate to the level of Being and Knowledge, which it connotes: "imaginative perception, imaginative knowledge, imaginative consciousness." The imaginal world argues for subtle existence, less material than the real and more than the ideal. As such, imaginal things hold shape, size, proportion, color, etc. without committing themselves to impenetrable density.

Ibn Arabi gives an example of an imaginal being in a tangible way that helps us better understand the notion of the subtle body (i.e., imaginal) at a different level. He explains its occurrence when angels (and Gabriel in particular) appear in human form to prophets and saints; and describes it as a subtle body. The personified angel is capable of traveling “up” to the domain of the intelligible while residing “down” in the physical world. This level associates subtle body with the realm of apparitional angels that are normally invisible to the human eye. In more general terms, the imaginal is a domain wherein invisible intelligible concepts become visible things. This defines the very condition of the subtle body—imaginal substance—as possessing attributes of the physical world (i.e., form, measure, nearness, farness, etc.), while by nature being able to move up and down to worlds it mediates.

Assuming a triplicity of worlds, the imaginal offers an alternative to our contemporary dualistic perspective, which will impact our readings of the architectural drawing. This effect is multifaceted. At an ontological level, *mundus imaginalis* argues for architectural drawing as self-subsisting state interdependent to, but separate from, the idea and building. This is a realm of simultaneity of demonstration and cogitation, where similitudes (*al-mithal*) lead to consciousness and knowledge.

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49 Corbin, H. 1989: ix.
There is no true being that does not accept change except God, for there is nothing in realized Being but God. As for everything other than He, that dwells in imaginal being…. Everything other than the Essence of the Real is intervening imagination and vanishing shadow. No created thing remains upon a single state in this world, the next world, and what is between the two, neither spirit, nor soul, nor anything other than the Essence of God. Rather, each continuously changes from form to form, constantly and forever. And imagination is nothing but this…. So the cosmos only became manifest within imagination…. It is it, and it is not it.

-Ibn Arabi, al-Futuhat, (1911 edition, 2:313.12)\textsuperscript{50}

Ibn Arabi, in his al-Futuhat, outlines a “Science of Imagination” (ilm al-khayal) and distinguishes between planes of imagination as ontological levels of being. The implications for the ontology of mundus imaginalis, and therefore creative imagination, become clear when we look at the three “worlds of imagination.” It is in this broader context that a comprehensive understanding of mundus imaginalis becomes possible. In Ibn-Arabi’s cosmogony, in the broadest sense of the term, imagination designates “everything other than God, the entire cosmos inasmuch as it is contingent and evanescent.”\textsuperscript{51} This is what Ibn Arabi called “Nondelimited Imagination” or Absolute Imagination (al-khayal al-mutlaq). Additionally, Ibn Arabi considered theophanic imagination as a state where “each of the infinite words articulated in the All-Merciful Breath discloses Being in a limited form. Everything without exception is both God’s face (wajh), revealing certain divine names, and God’s veil (hijāb), concealing other names.”\textsuperscript{52} In his view, each being in the world serves as a God’s face, which collectively represent divine’s essence and creation; according to Ibn Arabi, this is analogous to the structure of a circle. God’s Essence (dhat) is the center and the circumference is the realm of beings (i.e., God’s faces).

In this imaginative analogy, the radius is Will (irada) or Orientation (tavajjuh). Ibn Arabi writes: “if you assume lines projecting from the point to the circumference (muhit), these will terminate but unto a point. The whole circumference bares the same relationship to the point, which is his saying: ‘And God, all unseen, surrounds

\textsuperscript{50} Translation from Arabic by William Chittick, 2008.
\textsuperscript{51} Chittick, W. 2008.
\textsuperscript{52} Chittick, W. 2008.
(muhit) them,’ and his saying: ‘Is not he surrounding (muhit) all things?’53 Drawing on Koranic verses, Ibn Arabi uses the analogy of the circle to explain the creative act of the Divine, which corresponds to the level of the theophanic imagination.54 This visual analogy—the circle and radii projecting from its center—persist in most of his philosophical arguments. Interestingly, it is also an underlying geometric concept for many forms of art and design in the Islamic world. In this analogy, God is the center and the circumference and the in-between, which makes God’s face present in everything while his essence remains concealed. Therefore, each thing or concept both represents a presence and signifies an absence simultaneously. Inasmuch as a thing exists, it can be nothing but that which is—the Real Being. Conversely, inasmuch as it does not exist, it must be other than the Real. Each thing, in Ibn Arabi’s most succinct expression, is “He/not He (huwa/la huwa)—Real/unreal, Being/nonexistence, Face/veil. In reality, the ‘other’ is affirmed/not affirmed, …”55 This view is associated with negative theology (with such Christian prominent figures as St. Augustine, Pseudo-Dionysus, and Eckhart) and has attracted interest in post-structural philosophy.

The concept of theophanic manifestation is core and central to Ibn Arabi’s ontology of imagination. That God’s presence and manifestation in the visible world is graspable through Divine names plays a key role in his ontology. In his mystical teachings, God’s manifestation coincides with the creation of the world. In order that such a creative act becomes possible—or at least knowable to our understanding—he argues that Divine names representing various attributes of God, become necessary. The creation of the world, according to Ibn Arabi is achieved through four principal names: the Living (al-hayy), the Knowing (al-alim), the Willing (al-murid), and the Powerful (al-qadir). These four names manifest four attributes of Life, Knowledge, Will, and Power—a quadrature, and a pattern of proliferation for the creative act stage of divine manifestation. Samer Akkach represents this in a diagrammatic form (Fig. 1.2). Based on descriptions that evoke visual imagery, the diagram is geometrically symmetrical with the divine essence, which comprises the

54 At this level the creation is equal to the divine’s imagination.
55 Ibn Arabi, Al-Futuhat, 1911 edition, 2:501.4). Translated by Chittick. Quoted in Chittick, W. 2008. The coexistence of face/veil and existence/non-existence is particularly important and relevant to architectural drawing, in terms of both showing and not showing at the same time.
center circle. Ibn Arabi’s use of geometry as a vehicle to communicate cosmological concepts is frequently seen in his writings. This, in fact, speaks to the innate relationship between theosophy and geometry throughout the time.  

The second level of imagination, which Ibn-Arabi calls Dissociable Imagination or detached imagination, *al-khayal munfasil*,\(^{57}\) represents a narrower sense of the word imagination and is analogous to Corbin’s *mundus imaginalis*. In *Al-Futuhat*, Ibn-Arabi fully articulates this in-between realm as a real world, more real and “subtle” than the physical world, while at the same time less real and “denser” than the world of spirits.\(^{58}\) In theosophical terms, *mundus imaginalis* is where visionary experiences occur, a realm that requires substance yet does not fully happen in the physical world. Koran’s indication of “heaven, earth, and everything in between” also refers to this realm, a world of spirits and the world of bodies and everything between the two.

The third world of imagination belonging to the microcosmic human level “is identical with the soul or self (*nafs*), which is the meeting place of spirit (*ruh*) and

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\(^{56}\) Twentieth Century American architect Claude Bragdon who himself delved into the theosophical realm considered mathematics and geometry as a vehicle for the individual to imagine a higher cosmic consciousness. He considered the Forth Dimension of geometry as an exercise of imagination in higher dimensional thinking. For him theosophy without geometry would be “merely mystical and miraculous.” For a discussion of the Forth Dimension see; Bragdon, Claude Fayette. *A Primer of Higher Space (the Fourth Dimension).* Tucson, Ariz.: Omen Press, 1972.

\(^{57}\) Akkach also calls this as “All Encompassing Imagination.”

\(^{58}\) Chittick, W. 1989.
body (*ji"sm*).” At this level of imagination, Ibn Arabi introduces an Associable Imagination or Attached Imagination, *khayal muttasil*. This is because the imagination at this level is dependent on the subject, the human. Operating within the human experience, this level of imagination “designates the level of human imagination in its psychological framework (being an isthmus between human corporeality and spirituality.” Human experience is always “soulish” (*nafsani*), which is to say that it is simultaneously spiritual and bodily, bringing it into the realm of the imaginal. In such thinking, humans hover between spirit and body, light and darkness, wakefulness and sleep, knowledge and ignorance, virtue and vice. I have attempted to demonstrate Ibn Arabi’s matrix of imagination in the following diagram.

![Levels of Imagination Diagram](image_url)

**Fig. 1.3. Diagram Summarizing Ibn Arabi’s Levels of Imagination.** Human imagination as a voluntary act is capable of participating in the imaginal world and the experience here is soulish. Likewise angels from the world of spirits can descent to the imaginal and physical world. Diagram by the author.

The Absolute Imagination and Dissociable Imagination can be considered to belong to the Divine creative source, while the human soul and its imaginative faculty belong to the corporeal body—but with the possibility of participating in the realm of the dissociable/detached imagination. Since the soul dwells in an in-between

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59 Chittick, W. 2008.
60 is referred to as “attached” because it is, as Corbin explains, “an imagination conjoined to the imagining subject and inseparable from him.” Corbin refers to it as “dependent imagination” because its existence depends on “detached imagination,” which he refers to as “autonomous” and “a self-subsisting imagination dissociable from the subject.” See Corbin, H. 1998: 219.
realm, betwixt the spirit and the body, it can “choose to strive for transformation and realization.” Therefore, only as an imaginal reality can the soul travel “up” toward the luminosity of the spirit or “down” toward the darkness of matter.” 63 In this sense the soulish experience becomes imaginal.

Ibn Arabi states that our power of imagining things—that is, our ability to conceive of their forms abstracted from their sensible bodies—belongs to “attached imagination” (khayal muttasil), which is an individual’s imagining faculty operating within a human psychological framework. Detached and attached imaginations correspond to the macrocosmic and microcosmic states of imagination. It must be noted that human attached imagination depends upon detached (dissociable) imagination, and that human imagining/imagination represents one’s participation in the latter as Ibn Arabi indicates: “From this detached imagination attached imagination derives.” 64 Here, Ibn Arabi asserts that human imagination is potentially imaginal, which means that human imagination can be guided or informed through spiritual experience. Additionally, due to the association between the attached and detached imagination, the human imagination potentially becomes, in Corbin’s terms, Imaginatio vera, an active disciplined imagination that makes the unseen manifested into visible forms. Corbin also reminded us of the alchemist Paracelsus’s (1493-1541) warning against any confusion of the Imaginatio vera with fantasy, “that cornerstone of the mad,” 65 which is that of fantasy.

In a further articulation of the third level of imagination, Ibn Arabi divided human imagination into two kinds: imagining and dreaming. He explains that the former is a voluntary act, while the latter is an involuntary one, presenting “themselves like dreams (or daydreams).” 66 A dream represents an intermediary between the real (in the mystic sense, that is) “waking” state, and the waking consciousness in the common, profane sense of the world. 67 Active Imagination, which is both voluntary

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63 Chittick, S. 2008.
65 Corbin, H. 1976.
67 For a discussion on this see Corbin, H.1998: 217.
and disciplined-based, then, becomes an organ of understanding mediating between the intellect and the senses.\(^\text{68}\)

We can see how Ibn Arabi’s doctrine of the imagination in its psycho-cosmic function suggests two aspects: cosmogonic or theogonic, and psychological—in other words, both at the level of the self and world. As explained above, the two levels are “inseparable, complementary, and subject to homologation.”\(^\text{69}\) The exchange between the physical and the metaphysical in Ibn Arabi’s view is one of sharp distinction between the philosophical perspective and the Cartesian one that we now take for granted. Chittick considers ibn Arabi’s philosophical notion of the in-between as an alternative to dualistic philosophies: “Ibn Arabi’s foregrounding of the in-between realm was one of several factors that prevented Islamic philosophy from falling into the trap of a mind/body dichotomy or a dualistic worldview.”\(^\text{70}\) This, indeed, has many implications for the process of creating informing images, which at one end hold attributes of an invisible, intellectual realm, while at the same time are situated in the physical world.

In The Sufi Path of Knowledge, Chittick (1989) summarizes Ibn Arabi’s ontological discussion on the imagination by categorically distinguishing three different loci in which imagination becomes manifest: (1) in the cosmos (\textit{khayal mutlaq}), “where existence is identical with imagination,” (2) in the macrocosm (\textit{khayal munfasil}), “where the intermediate world between the spiritual and the corporeal is imaginal,” and (3) in the microcosm (\textit{khayal muttasil}), “where the human soul considered as a reality distinct from spirit and body pertains to imagination.”\(^\text{71}\)

An apprehension of the levels of imagination is significant to a discussion of architectural drawing as it provides a suitable framework on which to base this discussion. At the highest level, imagination and being are associated—a key concept for moving beyond the primacy of reason or sensory as the only realm for existence; in other words, architectural imagination and existence are inseparable.

\(^\text{68}\) Corbin, H. 1989: xviii.
\(^\text{69}\) Corbin, H. 1998: 216.
\(^\text{70}\) Chittick, W. 2008. Ibn Arabi is also known for his belief in a Unity of Existence or Oneness of Being (\textit{Wahdād Wujud Muttasil}), which assumes a union between the Creator and Creation, a perspective that argues for a coherent world of physical and metaphysical realities and reject dualism.
\(^\text{71}\) Akkach, S. 2005: 103.
The macrocosmic level of imagination calls for validating the triplicity of worlds (the alternative to a dual system), and validates the realm of the in-between. This particularly sheds light on the notion of representation and drawing as residing between an idea and the eventual materiality of the building— with the possibility of constantly mediating between the two. At the level of microcosm, the human soul is recognized as a creative agent operating the imagination. This means that the drawing could be potentially conceived by the human soul and the imagination.

The imaginal primarily calls for an ontological realm of existence for architectural drawing wherein the drawing is considered as an authentic existence in itself, and not necessarily a means to an end (i.e., a building). Referring to the imaginal model of Jerusalem, architectural drawings and models, possessing delicate matter (i.e., marks of ink on thin paper; miniature scale of objects), become subtle existences that ontologically calls for unification of intelligible concepts and visible lines. With the imaginal nature, architectural drawings are also conceived by the cognitive faculty of imagination and eventually contribute to the imaginative consciousness of the viewer.
THE CREATIVE FIELD OF IMAGINATION

Among the possible things there are three levels of known things (ma’lumat): (1.) A level that belongs to meanings disengaged (mujarrad) from substrata; the characteristic of meanings is that rational faculties perceive them through proofs or a priori (bi tariq al-badaya). (2.) A level whose characteristic is to be perceived by the senses; these are the sensory things. (3.) A level whose characteristic is to be perceived either by the rational faculty or by the senses. These are imaginal things. They are the meanings that assume shape (tashakkul) in sensory forms, they are given forms by the form-giving faculty, (al-quwwat al-musawwariya), which serves the rational faculty. (II 66.14)

-Ibn Arabi

The notion of imagination (khayal) infuses Ibn Arabi’s writings. He considers imagination as a power that can transcend physical restrictions to obtain new understandings. He frequently criticizes philosophers and theologians for their failure to acknowledge its cognitive significance. In his view, aql or reason, a term that derives from the same root as iqal (fetter), can only delimit, define, and analyze. Reason perceives difference and distinction, and quickly grasps the divine transcendence and incomparability. In contrast, “properly disciplined imagination” has the capacity to perceive the invisible, God’s self-disclosure …the symbolic and mythic language of scripture, like the constantly shifting and never-repeated self-disclosures that are cosmos and soul, cannot be interpreted away with reason’s strictures. It is a disciplined imagination, which Corbin calls “Creative Imagination,” in Ibn Arabi’s view, however, that must complement rational perception.

In Koranic terms, the locus of awareness and consciousness is the heart (qalb). The heart is considered to be subtler than mind and is more proper to understand subtle things. The term qalb suggests a sense of fluctuation and transmutation (taqallub). The root term is q.l.b, which means overturn, invert, change, transform. Heart is considered to be the organ that overturns humans from ignorance and darkness to truth and light. According to Ibn Arabi, the heart has two eyes: one for reason and

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72 Ibn Arabi is critical of relying merely fetter and regards heart and reason both as organs of understanding and complementary to each other.

73 William Chittick indicates that the term Creative Imagination “does not have an exact equivalent in Ibn ‘Arabi’s vocabulary.” Chittick, W. 2008.
the other for imagination, and the dominance of either distorts perception and awareness. In distinguishing the two loci of awareness and knowledge—one pertaining to the imaginable and the other to the intelligible—Ibn Arabi also distinguishes between the act of knowing and the act of imagining:

The conceiver and that which can be conceived – each is of two kinds. There is a conceiver that knows and has imaginative power and a conceiver that knows but has no imaginative power. There is also a conceived thing that has a form, according to which it can be known but not imagined by the one that has no imaginative power, and known and imagined by the one who has imaginative power, and a conceived thing that has no form can be known only. ... Knowledge is not conceiving the form of the known, nor is the meaning of the known being formalized. Because not every known admits form nor every knower is able to conceive of form. Form-conception is related to the knower through the latter’s ability to imagine, and form is related to the known through the state in which it is accessible to imagination. And since there are knowable matters that are originally inaccessible to imagination, it is certain that they have no form.

He indicates that not all the knowns are imaginable, and not all the knowers have the ability to imagine. Imagining is the capacity to conceive of the form of a thing. In other words, the imaginable should admit form. Akkach, drawing on Ibn Arabi’s theory explains: “If a knower can imagine the form of the known, this would point to his imaginative capacity, for there are things that can only be known without being imagined.” Known things that are conceived without being imagined do not hold form—they are acquired through the rational mind and discursive reasoning; knowns that admit to form are conceived through imagination. This is key to understanding the role of visual representation, and in particular geometry, in theosophy. Geometry is the world of conceivable things that possess form. Therefore, the knowledge of geometry is that of known things that admit form and entails imagination.

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74 Chittick, W. 2008.
Trusting that imagination was essential to complete reason, Ibn Arabi argued that the rational path of the philosopher and theologian needed to be complemented by the mystical intuition of the Sufis. This intuition’s function is that of “unveiling” (kashf) while “re-veiling,” which facilitates imaginal vision. This is the level of human imagination, a voluntary act that can participate in the higher level of mundus imaginalis, thereby bringing consciousness. According to Ibn Arabi, the heart is unitary consciousness in itself. Chittick, interpreting Ibn Arabi, explains that the heart “must become attuned to its own fluctuation, at one beat seeing God’s incomparability with the eye of reason, at the next seeing his similarity with the eye of imagination. Its two visions are prefigured in the two primary names of the Scripture, al-quran, “that which brings together,” and al-furqan, “that which differentiates.” Chittick insightfully interprets Ibn Arabi’s ontological and epistemological view regarding imagination and reason: “These two demarcate the contours of ontology and epistemology. The first alludes to the unifying oneness of Being (perceived by imagination), and the second to the differentiating manyness of knowledge and discernment (perceived by reason).” This view also dovetails with mainstream Western philosophical tradition that views imagination as the power to bring together discrete information and compose them into one single being, while reason analyzes, categorizes and de-compounds things. The Real, for Ibn Arabi, possesses two concurrent sides as he often indicates. It is the One/the Many (al-wahid al-kathir), that is, One in Essence and many in names, the names being the principles of all multiplicity, limitation, and definition. “In effect, with the eye of imagination, the heart sees Being present in all things, and with the eye of reason it discerns its transcendence and the diversity of the divine faces.”

In Ibn Arabi’s ontology, imagination is seen as the creative source of manifestation as well as a powerful intermediary that enables us to remain in constant contact

78 Chittick, W. 2008.
79 Ibid.
80 Ibid. Ibn Arabi continues: “He who stops with the Koran inasmuch as it is a quran has but a single eye that unifies and brings together. For those who stop with it inasmuch as it is a totality of things brought together, however, it is a furqan…. When I tasted the latter…. I said, “This is lawful, that is unlawful, and this is indifferent. The schools have become various and the religions diverse. The levels have been distinguished, the divine names and the engendered traces have become manifest, and the names and the gods have become many in the world”. Ibn Arabi, al-Futuhat, 1911 edition, 3:94.16. translated by Chittick.W.
with the Infinite and the Absolute. For Ibn Arabi, imagination represents such an essential cognitive instrument that “he who does not know the status of imagination is totally devoid of knowledge.” Elsewhere he indicates: “After the knowledge of the divine names and of self-disclosure and its all-pervadingness, no pillar of knowledge is more complete.” He insists, in fact, that “imagination is the widest known thing” because “it exercises its properties through its reality over every thing and non-thing. It gives form to absolute nonexistence, the impossible, the Necessary, and possibility; it makes existence nonexistent and nonexistence existent.” This attests to the very creative function of imagination, an active agent that gives birth to things as sensible realities.

The act of imagining, which is a deliberate act based on will, also involves the retaining of images perceived through the senses by the faculty/power of memory (al-quwwa al-hafiza), as well as the “composing of new images by a form-giving faculty (al-quwwa al-musawwira).” Imagination, then, is a domain in which the forms come to existence but without substance. Such a portrayal of the form-giving faculty of imagination accords with mainstream Islamic philosophers thought. The imagination has the power to decompose collected images using memory and recompose them into new sensible forms. This creative power of imagination is immediately present in geometry, where things come into existence that hold forms and tangible attributes. Geometry, thus, becomes a medium with a form-giving power that brings into existence realities that otherwise are inaccessible. These realities involve “form” and their process of creation entails “drawing.”

In Arabic language terms denoting “form” and “drawing” share same root with the form-giving faculty. Form (sura), imagining (tasawwur), and the act of drawing, painting, and forming (taswir), all derive from the root term s.w.r or swaawara, which means “to form,” “to paint,” “to fashion,” “to draw,” and “to configure.” Significant here is also the notion of imagination associated with the notion of “configuring,” which suggests the imagination as a productive agency, a creative field.

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82 Ibn Arabi, al-Futuhat, 1911 edition, 2:309.17
85 This is revealing regarding the role of the drawing and imagination as they both share same etymological root.
Imagination :: Image | The World of the Image

In discussing imagination as one of the heart’s two eyes, Ibn Arabi’s use of that language corresponds to a large number of philosophers who viewed the soul and heart in a similar dichotomous way. Ibn Arabi, however, is more concerned with imagination’s ontological status, about which the early philosophers had little to say. His use of the term *khayal* accords with its everyday use and meaning, “which is closer to image than imagination.” In his discussions, the term has been employed “to designate mirror images, shadows, scarecrows, and everything that appears in dreams and visions.” This use of the term makes *al-khayal* synonymous with the term *al-mithal*, an expression that was largely embraced by Islamic philosophers after Ibn Arabi. It is because of their interpretation of *mithal* that *alam al-mithal* also became known as “the world of the Image.” The Koran’s use of the term *mithal* (plural of *mithal*) interprets it as “like-ness and resemblance: it may be an example, a similitude, a parable, or an allegory.” Sciences, and in general geometric traditions, used the term *mithal* to denote a model, an exemplary vehicle for its capacity of demonstration. Therefore, *mithal* and the concept of demonstration become related. As such, *alam al-mithal* becomes a world of the model and a realm of demonstration.

Henry Corbin also referred to this world as the “world of Idea-Images,” and elsewhere as “Idea-Archetypes.” The intermediary world between the bodily senses and mental reasoning assumes the concept of image as an operative agent. The in-between world of the image-imagination also becomes a symbol; since the “intermediary symbolizes with the worlds it mediates.”

This intermediary realm—the world of the image between the world of Mystery (*alam al-ghayb*) and the world of visibility (*alam al-shahadat*)—is where pure concepts (*ma’na*) evolve into imaginal forms, forms that also possess attributes of the visible world. As Corbin informed us, the world of Idea-Images is “the world of
apparitional forms and of bodies of the subtle state. The subtle state is a condition in which the invisible assumes visible form, while not fully lending itself to the material world. In other words, it is a world that allows the invisible to become visible by means of the image. The image, holding attributes of the physical and non-physical worlds, becomes the most visible manifestation of the invisible concept, ma'na. This corresponds to the deliberate and fertile representation of an idea, a nonexistent in Ibn Arabi’s ontology. He “stresses that an image brings together two sides and unites them as one; it is both the same as and different from the two.” For this reason, it is important to consider his famous example of the mirror and the image. Ibn Arabi asserted that “a mirror image is both the mirror and the object that it reflects, or, it is neither the mirror nor the object.” This association of the object, mirror, and the image could only be understood when the agent producing the image (i.e., the mirror) is unified with the image itself. Likewise, “a dream is both the soul and what is seen, or, it is neither the soul nor what is seen.” From his insights, Ibn Arabi informs us that “by nature images are/are not” aligned with his ontological view of the Creator as He/not He. Therefore, an image simultaneously holds attributes of the existent and non-existent. As Chittick insightfully interprets: “In the eye of reason, a notion is either true or false. Imagination perceives notions as images and recognizes that they are simultaneously true and false, or neither true nor false.” Such an understanding of image fundamentally impacts our world, both the way we interpret and/or make worlds.

Therefore, alam al-khayal, the world of the image, is the world of “is/is not,” to which our imagination alone relates. It is a realm of simultaneously true and false, or neither true nor false. The world of the image, not fully grasped by the faculty of reasoning, requires “a faculty of perception belonging to it, a faculty that is a cognitive function, a noetic value, as fully real as the faculties of sensory perception or intellectual intuition. This faculty is our imaginative power,” which is also inseparable from the image. The power of recollecting images from

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92 Ibid.: 217.
93 Chittick, H. 2008.
94 Ibid.
95 Ibid.
96 Ibid.
97 Ibid.
98 Corbin, H. 1976.
memory, modifying them, and presenting them as images, in this view, is all one unified process. The science of imagination is also “the science of mirrors, all mirroring “surfaces” and of the forms that appear in them. … forms that appear in mirrors, they are not in the mirrors.”99 Such a view of the imagination and image was popularly embraced by artist, artisans, and architects throughout the 13th-18th centuries. Persian scholar Khwandamir (1475-1534?), for example, described a glass vessel with representations of 32 different artisans made by Khwaja Ali Arizagar in 1465 as "such a configuration that no more beautiful picture could be reflected in the mirror of the imagination."100 The reflected image, therefore, is materialized when it engages the mirror, but it not fully material since it exists as a reflection. The quality of is/is not of an image makes it understood not as a permanent thing, but in flux and evanescent—similar to the imagination whose characteristics are in perpetual transmutation. That is, the imagination (state of becoming) and image (state of being) become unified. Therefore, being and becoming coexist in the image. In this view, one can infer that no image is permanent and represents one moment in a longer sequential chain of “becoming-images.” This understanding of the image associates itself with a productive mode of thinking that is more imagistic, and is a conception that can also be inferred from al-Ghazali’s insight on the help of al-mithal (image, example, substance) to the rational knowledge. Drawing on the etymological studies of s.w.r, which sponsors a host of interrelated concepts, I can also see that the “being-becoming image” in itself is a configuration that possesses a structure of its own. In the physical world, the image manifests incarnation of thought into matter, yet flexible and amendable to evolve, making it a subtle matter for architectural design. In architectural design drawings, the state of becoming-becoming is that of pentimento in painting; new forms and structures emerge on the trace paper. Additionally, the sequential creation of an image is a notion frequently echoed in the sketchbooks of architects whose quick progressive sketch drawings demonstrate the process of becoming.

Geometric drawings are critical examples in this regard. Demonstrating the

100 Necipuğlu, G. 1995: 205.
simultaneity of being and becoming, each drawing is an artifact, yet subject to
further interpretations in process and product.

Embracing the idea of unification of imagination and image is one of the critical
outcomes of the understanding the notion of the imaginal as a coexistence of being
and becoming: a true ontological world of its own which by nature is in a state of
evanescent, traveling “up” and “down.” Such an idea redefines the ontological realm
of architectural drawing beyond a graphic translation of rational thought, or as
communicating some sensory-related issue—but as a rich world, a being-becoming
exercise that manifests its own existence.
POETICS OF THE IMAGINAL

Taste

Beginning with its earliest mention in Islamic writings, the notion of imagination has dealt with the inner senses and the human soul. It is the soul that receives notions of beauty through the inner faculty of imagination. In this context, beauty is received by dhawq (lit. taste). The concept of dhawq is based on the recognition of “heart” as a locus of awareness, as a vessel for perceiving more subtle matters that deal with the inner world of the soul. As such, its power of aesthetic perception “was a mysterious emotional quality by which the heart and soul could be moved, a subjective quality that nevertheless required objective standards.”

Sources have used the term both as noun and verb. As a verb, beauty was “tasted,” a direct relationship between the subject and the object of the beauty was implied in the context of mysticism. The concept of taste is closely associated with the imaginative capacity and internal senses.

Early Islamic thinkers using Neoplatonic approaches considered imagination at a psychological functioning level, with the possibility of penetrating a transcendent realm. In this way, imagination holds the power to collect, modify, and create images that are detectable by both the senses and the intellect. In the context of architecture, geometry was largely conceived as a medium that facilitated/hosted the soul’s faculty of form-making to reach the material world. Teachings of Euclid and Pythagoras, along with Islamic thinkers, portrayed geometry as a field involving meaning. Ikhwan al-Safa described two kind of geometry: sensible and intelligible. The study of the latter involves the intellectual arts and wisdom. This view of geometry also makes it an anagogical means for mysticism, a hermeneutical vehicle for elevating understanding and unveiling beauty to the soul. This explains mystics’ use of geometrical analogies to communicate cosmological concepts, and by association, how many artists have employed geometry to communicate mystic notions. This theosophically based view of geometry is not limited to Islamic culture, but is widely exercised. The following depiction (Fig. 1.4) of a painting from the 15th

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century used geometric form to portray the name Ali, who is associated with mysticism. Interestingly, that painting is comparable to a geometric drawing of Mondrian, who himself was a deeply involved in theosophy, and employed geometric language as a vehicle to communicate concepts.


Geometry became an intermediary between the soul’s faculty of form-making and the material representation. In this sense, introduced forms are regarded as products of the human soul, and the soul as an agent of making. At the transcendental level, that of mundus imaginalis, existence is defined as the soulish presence of the human in the constant act of transforming intelligible forms to sensible forms and vice versa. It is a state of becoming, of making and creating. The disciplined Creative Imagination, which in this sense is an agent of creation while belonging to its own ontological realm of mundus imaginalis, constantly transforms things to ideas (and vice versa) or brings into existence imaginal subtle entities. Therefore, imagination creates a realm of its own, a domain for soulish existence in which apprehending the beauty exceeds reason and requires dhawq, a soulish mode appropriate to the world of subtle matters the imaginal. In short, the soul can either descend to the lower realm of phenomena, or ascend to the higher realm of intelligible beings toward the pure Light of God.
Light and Proportion

Influenced by Neoplatonic writings on pure light (i.e., The One), the concept of emanation permeated throughout Islamic writings. Echoed by Koranic verses, the invisible was perceived as light to be unveiled. Al-Ghazali extensively discusses light at various levels of existence. Infused with metaphoric notions, light is found in anagogical terms. Unveiling hidden meanings of things through any of the five spirits results in receiving light.

Ibn Arabi’s mystical teachings of light and shadows also represent several schools of thought, in which the light was central to all types of discourse, including those pertaining to beauty. Light, therefore, played a major role in not only philosophical discourse, but also in the sciences, as all sciences came from the divine. It would be entirely natural to accept that the ultimate purpose of the sciences was to articulate the world relative to the Creator’s light and beauty.

Light, in fact, had already played a major role in Islamic aesthetics long before the prevalence of mysticism. Light was perceived as the “ultimate source of visual beauty and the precondition of vision.”

Muslim scientist Ibn al-Haytham (965-1040), also known as Alhazen to the West, elaborated on the aesthetics of light in his Book on Optics (kitab al-manazir). He wrote:

All visible properties can be perceived only from the forms produced in the eye by the forms of colours and lights of the visible objects … for light produces beauty, and thus the sun, the moon, and the stars look beautiful, without there being in them a cause on account of which their form looks beautiful and appealing other than their radiant light. Therefore, light by itself produces beauty.

In his theory of visual aesthetics, pure beauty (al-husn) is the result of a sophisticated interaction of 22 diverse factors, which was based on a subject-object contextual relationship. Therefore, for him beauty was not absolute. Interestingly, however,

105 These properties are defined as: light, color, distance, position, solidity, shape, size, separation, continuity, number, motion, rest, roughness, smoothness, transparency, opacity, shadow, darkness, beauty, ugliness, similarity, and dissimilarity.
he singled out two of those factors, light and color (which was defined as a quality of light), and indicated that these two by themselves were capable of producing beauty. For him the creation of beauty is dependent on the effect of the visual object on the soul by way of producing "in the soul an effect such that the form appears beautiful." Production of beauty belonged to the realm of the soul and the internal senses. While Ibn al-Haytham's treatise took mainly what we would call today a psychological approach, it was not altogether distant from a philosophical interpretation of the world. His treatise on optics, like many other philosophical theories concerning the internal senses eventually was incorporated into popular mystical literature. *Tanqih al-Manazir* (Revision of the Optics), an expanded translation and commentary by Persian mathematician and scholar Kamal al-Din al-Farsi (1265-1319), became popular in the Persian language. Farsi studied with polymath Qutb al-Din al-Shirazi (1236-1311), who together with al-Farsi held mystical views and are regarded as major commentators on *mundus imaginalis*. Al-Shirazi was also a pupil of the prolific writer Nasir al-Din Tusi (1201-1274). The works of such thinkers who wrote about internal senses also penetrated into more specialized texts on poetics, music, and calligraphy.

Proportion is another element that was frequently addressed in Islamic sources as a means of attaining beauty. Proportion was best found in geometry. In Arabic language the term denoting geometry is *handasa*, which is derived from term *andaza* meaning measure, which is associated with term *qaddara* (design) deriving from *q.d.r* (measure, number). Grabar refers to geometry as something that makes things “proportioned,” a concept that involves measure and number. Ibn al-Haytham, following his theory of aesthetics, introduced proportion as the third property that could create beauty independent from the subject-object relationship. Together with light and color, proportion played a major role in the creation of visual ornaments in Islamic architecture. The three elements that create beauty are also found as attributes of the imaginal—namely, maintaining proportion, color, and responding to light, which are elements also found in drawing.

Proportion, however, was not limited to visual culture since it was also important in music and poetry. Both visual and auditory experiences were able to recognize proportion. Widely accepted as the most important external senses, sight and hearing both sought beauty in proportioned and harmonious perceptibles. It is also by means of proportion that one’s soul can transcend to the higher realm of the intellect, which involves anagogical interpretations. Once a beautiful proportioned geometric pattern in the physical world becomes a vehicle to correspond to the invisible beauty of cosmic orbits, for example, it allows the viewer to inhabit the pattern and see (imaginatively re-construct) the invisible. This pertains to the anagoge, as lifting up the soul to see the unseen. In the case of geometry, it starts with imagination as a rich exercise to ascend to higher levels of consciousness and understanding.

Ikhwan al-Safa’s (Brethren of Purity) epistle on love and ideal beauty discusses that the longing of the eye and ear for harmonious sights and sounds corresponds to the human soul’s love for beauty. The soul’s involvement and response to beauty through the senses of sight and hearing (either perception or creation) becomes intellectual and spiritual (i.e., by means of anagoge). Moreover, beauty, in their view, is also associated with the celestial spheres and a transcendent realm:

If one establishes the measure of [musical] time by the regular, harmonious and proportionate succession of motions and silences, the notes resulting will be comparable to the notes produced by the movements of the spheres and the heavenly bodies and will be in concordance with them. Thus doing, the individual soul, that inhabits the world of generation and corruption, will recall the beatitude of the world of spheres and the felicity of souls who are there above… celestial bodies are more transparent than glass, more polished than a mirror. They touch, brush against each other, rub and resound as iron and copper resound. Their notes are concordant and harmonious; their melodies are well-balanced.

The beauty of sensible voices and visual artifacts, then, is recognized by the soul by

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108 This process while being intellectual and spiritual is also emotional and the experience and understanding beauty is described as that of “moving heart.” This will be discussed in further detail in the following pages.
means of comparing the proportioned celestial world. This view urges painters and artists to observe the right (celestial) proportions of colors and shapes in order to create aesthetically pleasing images. For Ikhwan al-Safa, the beauty of visual objects was defined in association with their capacity for capturing balanced proportions and symmetries of the universe; that is, a beautiful image would demonstrate some dimensions of the invisible universe to the visible man. Such practice was regarded as a proper model for the artists and craftsmen. They asserted, “In effect, the beautiful in this world is a trace of the universal celestial soul.”\(^{110}\) This mirror-like relationship between terrestrial visible images reflecting the celestial invisible order (a shared view among Muslims and followers of Neoplatonism) considers the soul as an active agent in perceiving light and proportion and in recreating them into visible forms.

Soul :: Dominion of the Imagination

Inspired by Neoplatonism, the Mu’tazili and Shi’i atomistic cosmology viewed the earthly realm of accidents as “dominated by a hierarchy of superior forces emanating from transparent celestial bodies, divested of matter with their dazzling lucidity and luminous purity,”\(^{111}\) which was key in recognizing the soul as the active agent for a noetic imaginative experience. In this hierarchical scheme, the rational human soul was capable of “mediating between the intelligible realm of reason and the sensible realm of matter. Just as it could descend downward to the ignoble corporeal world of the senses, it could also direct its longing gaze upward toward the resplendent beauty of the intelligible world, infused with brilliant light.”\(^{112}\) The soul here is in charge of transforming the intelligible order of celestial bodies and the universe into comprehensible forms. This is indeed achieved by means of the internal senses, acting as the intermediary between external sense and the intellect. While variously recognized in names and numbers by different philosophers, the internal senses represent where human imagination is located. It is the imagination

\(^{110}\) Ikhwan al-Safa, 1978: 36? This is similar to Plotinus’s argument that the beauty of the material object is derived from the artist’s soul that imitates spiritual beauty.


with the aid of other internal senses that contributes in the creation of works of art and beauty. Muhsin S. Mahdi has noted their relevance for the arts:113

The structure of the soul and the activities of its various parts or powers and their relationship and hierarchy arc of interest to any artist whose art consists of creating a work that pleases or conveys a message or arouses a certain feeling in the human beings who look at it or work or worship in it. Sense perception, imagination, intellect, passion, and practical understanding are all parts of the soul that the architect addresses to some extent through what he creates. The power of imagination, its functions in dreaming, the way it mediates between understanding and sense perception, its role as a receptacle of individual perception or revelation, and its creative role in representing this perception or revelation in sensible forms are all questions crucial to any discussion of... art works.

Mahdi’s observation on the continuity of imagination, along with a sense of perception and intellect and the soul articulates Ibn Arabi’s view of the unity of imagination and soul in the context of the arts and architecture. Therefore, the creative imagination of the architect becomes a manifestation for the creative soul. Considering that attached imagination is able to participate in detached imagination, human imagination potentially holds soulish attributes. As such, the human imagination becomes a participant in the imaginal, moving both ways. It can create beautiful things “down” in the material world or lift “up” a human soul by absorbing beauty. This can also be true in the case of architectural drawing; the drawing becomes an imaginal being capable of lifting us up to the world of ideas or taking us to the technical issues of construction—hence, a manifestation of the soul.

Soul :: Beauty :: Love

Historic authorities such as al-Ghazali, Ikhawan al-Safa, and others have frequently emphasized the innate relationship between soul and beauty. Soul is in search of beauty, and that is due to the love of beauty. “This concept of the soul’s innate love of beauty, ... was repeated in many later Islamic texts, once again can be traced

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113 Mahdi, M. 1980: 45-46.
back to Plotinus’s Enneads where the beautiful is defined in emotional terms as that which induces wonderment, longing, delight, and love because of its kinship with the soul.” Ibn Hazm (994-1064) discussed beauty as an object of love: “As for what causes love in most cases to choose a beautiful form to light upon, it is evident that the soul itself being beautiful, it is affected by all beautiful things, and has a yearning for perfect symmetrical images; whenever it sees any such images, it fixes itself upon it; then, if it discerns behind that image something of its own kind, it becomes united and true love is established.” Ibn Hazm’s and al-Ghazali’s observations over a century before Ibn Arabi and other prominent Islamic mystics suggest the emergence of a long Islamic tradition regarding the innate relationship between soul, love, and imagery over centuries. The soul’s attraction to beauty is due to the natural pursuit of love, as al-Ghazali notes: “Love is the seed of beauty.” He, like many other thinkers, considered God as the ultimate source of beauty. The association of beautiful forms with the celestial world influenced works of art and eventually visual culture. The work of art, ideally, was that which could reflect divine order in the material world. According to al-Dawwani, the soul’s attraction to the beautiful can provide a foretaste of divine love, a statement echoed in al-Ghazali’s conception of beauty as that which gives pleasure (lit. ḥadhā) in itself—and “yet at the same time is capable of inducing an intuition of higher forms of transcendental beauty.” The search for transcendental beauty and transforming that realm into a tangible form can only be accomplished through the soul’s creative act.

Image :: Beauty :: Emotion-Pleasure

The innate relationship between creating and the soul has been a central theme of the epistles of Ikhwan al-Safa. This relationship is particularly highlighted in works of art. Their works of art, however, included craft and making. Necipoglu reports, “The arts in the Islamic world were generally subsumed under umbrella terms such as fann and san’at that referred to all fields of expertise or skill in the crafts and sciences

115 Al-Ghazali, Alchemy of Happiness. 1909 edition: 25. Al-Ghazali’s conception on the love is similar to that of Marsilio Ficino in regards to love and beauty.
alike." This was similar to medieval Europe in which the arts represented broad horizons from poetry, technological issues, ... to artisanry. This understanding of fann and san'at is close to the Greek notion of techne. The etymology of the term art (san'a) is revealing. The word “art” was attributed to made things, in other words, to crafts. San'a, meaning art-craft, is associated with the terms son’ (lit. making, made), and tasannu’ (lit. artificial making). Analogous to the Greek concept of techne, in which both art and technique are in union, san'a holds such capacity. Therefore, engaging in the work of art also meant to make crafts. Fann also referred to skill, a “how-to” experience that also meant “knowledge” in practical contexts. Associated with soul and beauty, San'a (i.e., arts and crafts) held high status in Islamic culture. Brethren's epistle on the “loftiness of the crafts” (sharaf al-sana'i) attests to the status of san'a as a result of the creativeness of the soul. This epistle “reflects the intellectual basis of the crafts, and is intimately linked with the ‘productive faculty’ of the soul. Here, a craft is defined as the imprint of a creator's mental image (al-sura) on raw matter. Importantly, a number of crafts have been described as lofty with respect to particular criteria." The lofty craft with its artistic importance is capable of moving the soul and triggering a sense of pleasure and wonder (al-ta'ajjub). Ibn Sina defined “wonder” as a first step towards comprehensive understanding and wisdom, yet he never reduced wonder to merely a means of furthering knowledge. Necipoglu reports that al-Farabi and Ibn Sina's poetics “stressed the independent aesthetic value of pleasurable awe in and for itself while also recognizing its potential relation to further knowledge. This was also the case with imaginative visual representations.”

Therefore, in order to be considered as “lofty”—regardless of it being a visual representation or a building—the craft had to demonstrate beauty to trigger a true sense of pleasurable awe, potentially leading one to further knowledge. In such terms, the beautiful object takes the viewer to higher forms of transcendental beauty, concurrent with a sense of pleasure. In Islamic literary theory, the

118 Therefore, “The medieval theory of art (ars) was, therefore, "first and foremost a theory of craftsmanship." See Necipoglu, G. 1995:185.
120 For a further discussion on the role of wonder in al-Farabi and Ibn Sina see Kemal, S. 1991. (The poetics of al-Farabi and Avicenna).
relationship between pleasure, wonder, desire, and the imagination is closely interwoven. This intimate association can be traced back to al-Farabi's and Ibn Sina's poetics, wherein they emphasized the intimate nature of aesthetic experience and beauty. Ibn Sina described poetry as imaginative speech and wrote that imaginative assent to poetic utterances "is a kind of compliance due to the wonder and pleasure that are caused by the utterance itself." This intricate sense of wonder-pleasure—which in one respect could be referred to as the mental cognitive activities of the soul, and in another respect as corporeal involvement—is an experience attached to the discovery of (transcendental) beauty in a material artifact or in an artifact of subtle nature. This process, while being emotional and pleasurable, also urges the individual to discover beauty. Frequent historical indications of "moving of heart" after seeing or hearing a work of art verify the mental-corporeal experience of wonder-pleasure. Al-Ghazali's indication that "everything the perception of which gives pleasure and satisfaction is loved by the one who perceives it" is revealing in the sense that one could relate the sense of pleasure of experiencing a drawn image or a built object as an indication of love of the subject to some beauty perceived in it. This corresponds to the tale of the origin of drawing told by Pliny (25-79 AD), in which the first drawing was a traced shadow by a beloved's departing lover, so that in looking at the drawing the lover would gain a sense of satisfaction, pleasure, and love:

It was through the service of that same earth that modeling portraits from clay was first invented by Butades, a potter of Sicyon, at Corinth. He did this owing to his daughter, who was in love with a young man; and she, when he was going abroad, drew in outline on the wall the shadow of his face thrown by a lamp. This parallel between the two cultures with respect to love and beauty regarding an object is also interesting in that the drawing (both process and product) of the

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125 Pliny, Natural History, vol.9, Book, XXXV, 43: 371-373. Pliny continues the story: "her father pressed clay on this and made a relief. Which he hardened by exposure to fire with the rest of this pottery; and it is said that this likeness was preserved in the Shrine of the Nymphs until the destruction of Corinth by Mummuis." This story not only delves into the origin of drawing but also modeling and the innate relationship between the two.
departing lover can be viewed as an imaginal subtle matter, for the traced lines were based on a real person while casting shadow on the wall.

With “everything beautiful is an object of love,”\textsuperscript{126} noteworthy to mention is that for Islamic scholars, the ultimate beauty and love is associated with the invisible. Al-Ghazali emphasized that the highest object of love is God’s beauty: “The causes of love (and these include beauty) are real only as applied to God.”\textsuperscript{127} Therefore, the chain of discovery of beauty starts with the material world from the well-proportioned tangible craft, but exceeds the material world and potentially reaches to the divine realm. It is in light of this perspective that the creation of beautiful material objects becomes an emotional experience. This emotion is a blended sense of wonder-pleasure. Also, it is in this philosophical context that the visual representation and drawing that precedes the building and ornamentation plays a role in taking the viewer from this world and shows him a glimpse of the beauty of the invisible celestial order, causing a sense of pleasure and wonder.

The artist’s inner vision (\textit{batin}) is the driving force behind the creation of novel images or objects. This is due to the soul’s association with the imaginal, a realm of both ideal and real possible forms. Creative imagination produces images modified from the reality that are “familiar” enough to be pleasingly recognized, and casts forms from the realm of ideality, unseen before, and “novel” enough to cause a sense of wonderment. How beautiful the simultaneous emergence of these two feelings!

Image-imagination :: Mimesis :: Will

The imagination with its power of giving and transforming forms and images (as essential functions of \textit{tasawwur}) is central to the inner vision and internal faculties. Al-Ghazali acknowledged the role of the internal faculties in creating beautiful objects to arouse pleasurable awe. Indeed, the beauty of an object for him was a projection of the inner beauty of its creator: “The beautiful work of an author, the beautiful poem of a poet, the beautiful painting or a painter or the building of an

\textsuperscript{126} Necipoglu, G. 1995: 192.
\textsuperscript{127} Ibid. 193.
architect reveal also the inner beauty of these men."\(^{128}\) In making artificial objects, the inner faculty of imagination magically transforms materials into a finer status with intellectual attributes. This alchemic power is the "ingenious skill of architects and decorators who ennoble raw matter through ideal mental forms abstracted by the power of the internal senses."\(^{129}\) Al-Jurjani compared this magical transformation of the raw material to the power of alchemy by granting it a nobler intellectual quality: "Poetry creates out of ignoble material inventions of transcendental value; and acts in such a manner as to make you believe that alchemy is truthfully capable of performing what is claimed for it, and that the philosopher's stone is true and credible - save that these operations are, in the case of poetry, operations which involve man's imagination and understanding rather than the body or senses.\(^ {130}\)

Such perspective is also persistent in our contemporary time as evident in Le Corbusier's view: "The business of architecture is to establish emotional relationships by means of raw materials,"\(^ {131}\) which emphasizes granting a nobler quality to raw materials in order to arouse emotions. The finer quality that is endowed to "things" (e.g. buildings) involves mimesis and imagination. It is the imagination that uses raw materials, whether collected images and words from memory or visible forms and matters, and then transforms them into finer existents. This is essentially a mimetic act, and as Gadamer indicates, involves pleasure: "The pleasure involved in mimetic behavior and its effects is a fundamental human pleasure ..."\(^ {132}\) The act of imagination with its mimetic attributes involves engaging the individual in both intellectual joy and sensorial pleasure.

Literary critic al-Qartajanni (1211-1285) identified three types of mimesis in imaginative creation (\textit{takhyil} a term from the root \textit{kh.y.l} also meaning \textit{khayal}) in the context of poetry. Recognizing the rhythmic and metrical nature of poetry, he considers the imaginatively creative compositions as acts of mimesis, which can be achieved by "mimetic representation of the usual by the usual, the strange by the strange, or the strange by the usual. And the closer the object is to that by which it


\(^{129}\) Necipoglu, G. 1995: 204. Necipoglu, here refers to written sources stressing this magical quality of the imagination.

\(^{130}\) Cited from Abu Deeb 1979: 264-265. This is quoted in Necipoglu, G. 1995: 205.

\(^{131}\) Le Corbusier, 1986: 4.

\(^{132}\) Gadamer, H. G and Bernasconi, R. 1986: 119.
has been mimetically represented, the clearer will be the similarity; on the other hand, the more strangeness and wonder are added to the imaginative creation, the more original it will be.”

As articulated by al-Qatarjanni, “between the two poles of naturalistic and fantastic representation extend a varied spectrum of approaches to mimesis” for the artist and the architect to pursue. Islamic teachings that avoided naturalistic figures and representation pulled the Muslim artist away from the likeness approach. Like many Muslim critics, al-Qatarjanni favored the originality of “strangeness” and “wonder” over “similarity.” Necipoglu explains “the more artificial and removed from likeness to observed nature, the more artistic was poetic discourse considered.”

Necipoglu, however, remains silent about the potential involvement of the imaginal and anagogical attributes of the Islamic art. I interpret al-Qatarjanni’s conception of the mimetic act as favoring “strangeness” and “wonder” and as a search for the invisible using visible apparatus. The sense of “wonder” (taʻajjub) corresponds to the “moving of heart” and “lifting of the soul,” indications of associations between mimesis, the imaginal, and the poetic act.

The mimesis that al-Qartajanni considered to be creatively imaginative was not one that truthfully reproduced reality; rather, similar to Gadamer’s interpretation of the mimesis, he indicated that, “The mimetic is and remains a primordial phenomenon in which it is not so much an imitation that occurs as transformation. It is, to use a deliberately artificial expression …,” which is one that transformed it in order to arouse subjective feelings of pleasurable awe and astonishment. The transformation involved in mimesis must be seen in the imagination. Necipoglu highlights the role of wonder as follows: “Imaginative representations possessed an element of wonder that truth lacked; they were capable of inciting emotional responses distinctive to human beings with a spiritual and intellectual capacity.” Imaginative visual representations, therefore, were regarded as intermediary willfully “made” things to lead the individual to wonder higher realities.

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135 Gadamer, H. G and Bernasconi, R. 1986: 121.
Imaginal :: Worldmaking :: Being

In looking at the “creative” power of the imagination, one realizes that the act of making occurs at different levels. An individual’s imaginative power creates things or causes things and crafts (i.e., the work of art and architecture) to be created in the material world. The imaginal world, where the material and non-material co-exist, is the source of all creation. In looking at the nature of the imaginal world, which represents an intermediary between the non-visible ideality and visible reality, one could infer that the creative act is transformative, thereby mimetic, and is manifested within the realm of subtle matter. This creative process is a transformation of one entity through a mimetic act into another entity, a two-directional moving from ideality to reality and vice versa, which is manifested in the imaginal existence. Ideas are transmuted into visible forms, and visible forms are perceived as meanings in the imaginal. This is the same act of design: a two-direction representational practice well-manifested in the architectural drawing. The architectural drawing features the simultaneous presence of conceptual meanings and forms, proportions, and color all on the thin delicate medium of paper. While it suggests form, proportion and color, it is not the building, and while it alludes to meaning, it is not invisible. Therefore, it is less material than the building and more than pure meaning. The process of executing the drawing, too, could start from an abstract conceptual meaning or from built precedent; both of which pertain to the in-between-ness of the drawing that possesses a world of its own, the imaginal world.

By participating in the imaginal realm, in its “discontiguous” soulish sense, imagination then is creatively in pursuit of beauty. Things are seen and perceived through the same imaginal window as ideas are incarnated into visible forms. In creating meaningful images for the living world, the imagination undertakes mimesis in both senses—of modifying collected images by the faculty of memory and then turning them into a new original image and “imitation of action” of God’s creation. This analogy is made by many Islamic thinkers, among whom al-Ghazali wrote, “Just as the greatness of a poet, writer or artist becomes all the more notable the more you know of the wonderful works of poetry, writing and art; in the same way miracles of the creation of God are a key to the knowledge of the greatness of
the Creator.” The imaginal realm, comparable to the Creator’s act, is thus a realm of poetic creation.

At a higher level, the imagination hosts an autonomous realm of its own, the imaginal. This realm is a productive world of constant change and transformation; in religious terms, it is where the angels manifest themselves as visible entities—as it occurred to the Prophet in the Night of Journey (Fig. 1.5).

In non-religious terms, it is where forms, shapes, and proportions are born and are comprehensible. This is the realm of worldly imagination, in which imagination creates the world of its own. As the French poet Baudelaire indicated, imagination is “the queen of the faculties,” the worldly imagination “decomposes all creation and creates anew world, the sensation of novelty.” Considering Ibn Arabi’s view of an image as “is/is not,” we can infer that the image belongs to a third world that hosts two modes of realities: existence and non-existence. Such a perception stresses the non-existence as an integral part of the image. Therefore, I can say that an image embodies non-existence; this is what makes the imaginal world a realm of

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137 Cited in Ettinghausen, R. 1947: 165.
simultaneous *presence-in-absence* and *absence-in-presence*, a realm for which immediacy is essential to human existence. This view of the imaginal, beyond the historical “intermediary” role of the imagination, also argues for the immediate presence of visible and non-visible aspects of existence. This occurs through instant access to a world of subtle matter.

It is this aspect of the imaginal world that makes it relevant to our world—a realm of immediacy wherein beings are representational and independent of the sensory and reason.\[139\] It is the imaginal world that also conceives existence as representation. Ibn Arabi mentions that “Moses was made to imagine,”\[140\] a radical statement that defines imagination as the ultimate contemplative power. He emphasizes the worldly creation of the imaginal by questioning the existence of the material world:

> The world is illusory: it has no real existence. This is what is meant by “imagination” (*khayal*). You have been made to imagine that the world is something separate and independently real, outside of the Absolute. But in reality it is not so. Do you not see that in the world of sensory things a shadow is attached to the person from whom it originates and that it is impossible to separate a thing from its essence? …\[141\]

Elsewhere he rephrased this statement and asserted that the world was pure representation, a verification of the imaginal realm in conceiving of the world as representation.\[142\] In this sense, the essence of the human being is defined in association with the capacity of imagination. Translating these lessons into the world of architecture and drawing, one can argue for the inseparability of the architectural drawing from the building, and most importantly that architectural drawing, holding imaginal nature, conceives a world that ontologically is true and epistemologically valid.

German idealist philosopher Friedrich Wilhelm Joseph Schelling (1775-1854), whose ideas of “worldly imagination” are akin to those of Islamic Mysticism, associates

\[139\] Richard Kearney discusses this aspect of the imagination as a characteristic of our contemporary conception of the imagination. For more detail see: Poetics of Imagining.

\[140\] Quoted in Chittick, W. 1989. (Sufi Path of Knowledge)

\[141\] Chittick, W. 1974: 30. (Sufi Doctrine of Rumi)

\[142\] Ibn Arabi, 1975.
imagination with poetic existence and regards the power of imagination as “unconscious poetry of being.” In this sense, the imaginal itself becomes a poetic world, as does the imaginal being. Central to this poetic world is imagination. Ibn Arabi’s insights on detached imagination calls for unity of meaning and matter in concept. “Incapable of receiving meaning disengaged from substrata,” while ascending to the realm of intelligence and descending to the realm of material phenomena, the imaginal is inextricably linked with the act of worldmaking. As much as this world is familiar to those who engage in it, it is an ambiguous realm; things are both true and false, nor true or false. Things with imaginal attributes could go either way: be more materialized or less materialized. The imaginal is a creative state of in-betweenness, which constantly transforms existence to non-existence and non-existence to existence, creates and absorbs the world as representation... and eventually makes the soul conscious of its being.

In architecture, the imaginal and its potential for worldmaking can be seen at a variety of levels: First, at the level of self, when the designer recognizes the self as a mortal entity, where the human imagination is able to participate in the higher world of invisible intelligences. Here the designer apprehends the soul as a perceptive and noetic agent capable of lifting up our consciousness and understanding of things and forms beyond their merely tangible reality. At this level, tangible forms on paper invite one’s imagination to exercise its flight to reconstruct the invisible world, a realm while not seen is fundamental to our dreams. It is a territory that feeds our dreams and imagination to have a desire and will for yet-non-existent buildings. It eventually creates a parallel world for the architect in which his/her drawings create worlds that are not out there yet, but have attributes of the physical world.

Second, at the level of expression and representation, one’s desires and intentions can be expressed to the world through three different means: thought, imagination, and body. Through the physical body, it is the sense-based human action that interacts with the world, and through thought, meanings can evolve. Through the

\[145\] These three mediums also correspond to three levels of (human) existence: intellect, imagination, and physical substance.
imagination, though, the imaginal becomes manifest in the subtle matter of the
drawing, which involves of the other two mediums (action and thought). At this
level of expression, geometry becomes a suitable vehicle for the flight of
imagination. Geometry—with its roots in the world of intellect and reasoning on the
one hand, and making tangible forms and shapes on the other hand—serves as an
intermediary to connect the two worlds, thus providing a higher space for
contemplation and constructing the invisible. This is in fact a level of worldmaking,
in which the drawing/geometric construction becomes an immediate world of itself.

Third, at the level of architectural elements almost every architectural element can
see a material correspondence to some higher meanings. “Window,” for example,
can be viewed as beyond a mere physical opening in a building to an imaginal
aperture that connects the inner world (of the building) to the outer natural world
(of the landscape). This view suggests the presence of another world that exists
parallel to the physical world of the window. In such a view, the physical window
becomes a means to lift our understanding, and make us more conscious regarding
conceptual associations between inside and outside. These two worlds join the
materiality of the architecture to higher dimensions within which it resides, creating
an imaginal dimension for material objects.

An understanding of the imaginal world infuses a fresh breath to what we do as
architects. One of its impacts is contributing to a better understanding of what is
generally referred to as design thinking, with an immediate impact on architectural
drawing. The fact that contemporary architectural imagination in some degree
participates in the realm of the imaginal could suggest significant pedagogical
changes in how to read and write these visual artifacts. Since architectural
imagination maintains close contact with both the material world and immaterial
realm—meaning that the process of creating the built environment involves a
continuous circle of ascending to the world of meaning and descending to the
world of materials—makes this connection so relevant. Design activity, then, is not
defined merely as a transforming passage from the ideality to the materiality or vice
versa, but it is a world of its own that embodies both. Indeed, most likely a
simultaneity of the two seemingly opposite moves is present. This makes the
drawing, too, an imaginal in-between the two poles of mental and material worlds.
Belonging to the imaginal, the drawing constantly seeks beauty and love; as such the imaginal drawing becomes a subtle poetic artifact that moves the heart and becomes an emotional experience. Part Two will examine this in-between condition in the Islamic tradition of architectural representation – as expression of the imagination/imaginal through the geometry.
2: BETWEEN IDEA AND THING

Once the imaginal and its association with the imagery and visual culture of the Islamic world is discussed, the study looks at the visual material and culture of the Islamic world as they pertain to architecture. A chronological review of the visual material and culture of the Islamic world identifies a major surviving mode of representation: the geometric pattern of girih (lit. knot). While recognized as a unifying theme for architectural drawing, girih experienced periods of evolution since its emergence in the 10th century. The temporal parallels between the evolution of girih and Islamic thought suggest that the geometric drawing of girih, at its inception, held psychological and potentially transcendental attributes. As Islamic mysticism expanded, girih most likely continued to open itself to the transcendental, symbolic, and divine interpretations/capacities. Such evolution of the metaphysical aspects of girih is revealing, since this long-standing architectural drawing could be considered as provinces of the spiritus and imaginal. In the end, selected historical examples of architectural drawings are examined to unfold the imaginative dimensions of such representations. This will be accompanied by a discussion on the qualities and characteristics of these drawings.

1 Visual material and culture broadly refers to paintings, geometric mode, ornament, artifacts, visual thinking, etc.
THE INTERMEDIARY MEDIATIVE FIELD OF GEOMETRY

Know, Oh brother, ... that the study of sensible geometry (al-handasa al-hissiya) leads to proficiency in all the practical arts, while the study of the intelligible geometry (al-handasa al-aqliya) leads to proficiency in the intellectual arts, because this science is one of the gates that leads to knowing the substance of the soul, which is the root of all arts.

-Ikhwan al-Safa, Rasail.

Islamic visual culture widely embraced geometric canons to conceive ideas in built form. Influenced by Greek sciences and philosophies, early Islamic scholars in their attempt to consolidate Islamic teachings with Greek philosophy, adopted geometry as practical means for the arts and crafts as well as an intellectual vehicle. The first of Visual Representation and Culture in the Islamic World Appendix, examines the evolution of visual representation in the early centuries of the Islamic world and provides essential information on how geometrical drawings adorned spiritual scripture since the 10th century.

In this era, mathematics was regarded as highest among the sciences for its correctness of universal rules. As such, mathematics and geometry soon found their way into the practical fields, infusing philosophical teachings to the arts and crafts. Bier and Kheirandish report of the emergence of geometry as a subject transcending disciplinary boundaries and as a means of “linking sciences and crafts in the production of knowledge.” The prevalent use of the Elements and Optics of Euclid in Islamic thought at this period is reported as early as the time of Caliph Harun al-Rashid (763?-809), who established the legendary library of Bayt al-Hitkmat. The influence of Greek teachings on proportionate beauty, which was increasingly melded into Islamic teachings, found a home in geometry—universally regarded as capable of creating noble proportions and transforming transcendental thoughts into material buildings. Abd al-Rahman III (912-961), who was the first of the Spanish

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2 I recommend the reader study the Appendix A, Visual Representation and Culture in the Islamic Word, as an essential introduction to Part Two of the dissertation. Appendix A provides a historical overview of the visual and material culture of the Islamic world from early centuries till the 10th century when the geometric exercises became popular—where Part Two starts.


Umayyads and caliphs of Cordoba, is reported by the early 17th century historian al-Maqqari to have composed these verses:

When kings want to immortalize the memory of their loftiest thoughts,
They do so through the language of architecture.
A building, when it is of noble proportions,
Reflects the majesty and rank (of its builder).

The poem shows the high status of geometry as a powerful means to advertise and immortalize both the patron and the builder. This verse also speaks to the transformative power of geometry in transmuting “intelligible” thoughts into “matter.” The caliph, interestingly, spoke of architectural language and associated that with geometry (by making noble proportions). Given the significance of this era when intellectual efforts were ongoing to consolidate Islamic teachings with philosophical thoughts and sciences, one can interpret the caliph’s few lines as an indication of his thorough understanding of how architecture could reach beyond practicalities (i.e. shelter, use, etc.) and assume powerful semantic, symbolic, and metaphysical dimensions.

It was in this context that Neoplatonism, because of its advocacy of melding religion and science, was becoming increasingly popular among Muslim theologians. In fact, interest in the sciences expanded greatly to include medicine, optics, and mechanics, among others—and provided intellectual fuel for the West in later centuries. In looking at the school in Alexandria, it was there that Muslim scholars first generated an important taxonomy of sciences, a critical context upon which the architecture of the time must be studied.

Al-Farabi is known to be the first Muslim scholar who provided a comprehensive classification of the sciences. He regarded the sciences—and in particular geometry—as both theoretical and practical. Architecture fell into the category of

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5 Ruggles, F. 2011 : 78. Poems are translated by Ruggles.
6 Caliph Abd al-Rahman III is also known as a patron for the architecture and arts. It would not seem unreasonable to assume that each individual or patron with the Caliph’s level of interest in architecture would consider architecture with the same symbolic eye. Ibn Khaldun, over two centuries later, while assuming the primary purpose of architecture is to provide “shelter,” reiterates the same message conveyed in the caliph’s words.
*ilm al-hiyal* (lit. science of deception), a subcategory of practical geometry. The term *ilm* means science, knowledge, certain, assurance, and trust. The term *hiyal* is the plural form of *hyla* meaning trick, deception or the process of searching for a solution. Therefore, *ilm al-hiyal* refers to the science of deceptions and tricks (for approaching a state of certainty and trust). Etymologically examined, this science is an interesting field in the sense one should achieve a level of trust to make deception work. However, it is generally translated as the sciences of mechanics. Architecture, then, could be viewed as natural magic (or even trickery)—or more mundanely—as a field of mechanical science that seeks ways to apply mathematical truths (intelligible) to the material world. Al-Farabi explains this category of sciences:

> *Ilm al-hiyal* is comprised of the knowledge of finding a recourse by which the human can apply all those concepts whose existence have been proved by mathematical reasons onto the objects of the external world, and to give them [mathematical concepts] existence in the external objects. Note that in the mathematics, lines, planes, solids, and numbers, and other mathematical concepts are studies only separate from external objects and in intelligible terms, but when making these mathematical concepts in the world out there—that is in the natural objects and [in] the sensible [objects] willfully and by means of *san'at* [(lit. art, artisanary, technique)]- we need a faculty to bring into light the [practical] ways of considering and making these

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7 This ingenious science of *al-hiyal* is first attributed to Banu Musa (d.873), two brothers and Persian scholars and inventors of the 9th century who lived in Abbasid Baghdad and worked in Dar al-Hikmat. Banu Musa's *kitab al-hiyal* (Book of Ingenious Devices) contained nearly one hundred drawings of mechanical devices, explaining how to make and use them. Al-Jazari (1136-1206) also worked on this subject and his work is regarded as a climax for *ilm al-hiyal*. His famous *Kitab fi Ma'arif al-Hiyal al-Handasiyyah* (translated as: Book of Knowledge of Ingenious Mechanical Devices). In that highly illustrated book he introduced about fifty devices and ways of making them including a “clock castle” whose scale and spatial occupation is closest to architecture. Other pages of illustrative descriptions of the proposed devises are very informative. Semi-perspectival drawings of mechanical wheels in semi-sectional spaces reveal that such tradition of spatial decoration was already familiar among craftsmen. Interestingly, while both architecture and those fields were closely related under *ilm al-hiyal* but in architecture such spatial modes of representation have not been recorded. This implies a deliberate embracement of abstraction in the visual idioms by the architect-engineer. One could interpret this in light of the fact that architecture was regarded beyond objects and objective means and maintained a symbolic presence. That is why it did not lend itself to the objectifying eye to be represented in the way it is “seen” in the visible world. Noteworthy to mention that the literal translation of his book would be as following: book on the knowledge(s) of geometric deceptions/recourse. This use of the term geometry (*al-handasa*) to denote “mechanical device,” verified by the content of those books, can also imply the “practical” and “transformative” nature of ingenious geometry among those scholars.

For discussions on Banu Musa and al-Jazari see: Selin, H. 1997: 813.
mathematical concepts, and make possible their accordance with the external substrata and objects, that is because the external substrata and objects maintain manners and qualities which prevent concepts that have been proven in the mathematics, easily and in the way they [concepts] are, be accorded into these objects, but a power is needed to make the natural objects so ready in a way so to embrace/accept all these intelligible forms and mathematical concepts, and in removing restrictions … This is the very ilm al-hiyal that identifies the way of understanding such recourses and exact manners of practicing/manifesting these concepts by means of art (sanʿat), and demonstrates how we can manifest intelligible concepts in the natural substrata.8

Therefore, for Al-Farabi, ilm al-hiyal is an ingenious practical science that transforms intelligible forms and concepts into visible and tangible material forms. He further articulates this intermediary field and distinguishes between drafting and making:

The science of mechanics is the knowledge of how to manage and configure all that which its existence is established by definition and proof in the aforementioned sciences regarding natural bodies, and designing and crafting them in the objective world. This is because all those sciences only deal with lines, surfaces, dimensions and numbers, as well as things, which are purely rational and detached from physical bodies. But when it comes to crafting things and materializing them by will and manufacturing them in physical bodies and sensory objects, we realize that material things and sensory objects have qualities, which do not accept every configuration and resist accepting it easily. Rather a plot is required in order to accommodate that configuration in physical bodies and overcome those deterring qualities.9

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8 Al-Farabi, 1985: 89-90. Translation from Persian by Hooman Koliji.
9 Al-Farabi, 1996: 63. Translation from Arabic version of Ihsa al-Ulum by Mohammad Reza Jozi. Mr. Jozi is a scholar and research associate in philosophy and theology at London’s Institute of Ismaili Studies. He has translated and edited several major mystic and philosophical texts, among those include works of Ibn Arabi and Ikhwan al-Safa. The author wishes extent his special thanks to Mr. Jozi for his time on the translation of this piece.
Al-Fabari’s articulation of *ilm al-hiyal* is very similar to that of moving from design to building, in the sense that materials resist accepting design configurations. This perhaps is a reminder that architectural drawing could be considered as representing the will to change reality, which resists the change.\(^{10}\) In further explaining its subcategories, al-Farabi mentions *ilm al-hiyal al-handasiyya* (lit. science of geometric deception) and introduces five subcategories related to making crafts and tools. Some of those include tool making for measuring areas, astrological musical tool making, weapon making, as well as crafts related to the formation of cities—building crafts, carpentry, etc.:

Another branch of the science of mechanics is the geometrical mechanics which has many divisions: such as architecture, surveying the surface of various material objects, manufacturing astronomical instruments, manufacturing musical instruments, arching technics, and weaponry. Also, the optical industry for making instruments for viewing the reality of the visible objects from distance, and the industry of perspective of the blind spots which returns the light by diversion or reflection .... Also in this way one becomes aware of the places, which redirects the light of the sun towards other planets. From this appears the industry of burning mirrors and its engineering. Also, the industry of marvelous engines and the instruments for many other industries. So this and its likes are the foundation of a society’s practical industries which is applied to bodies, forms, designs, locations and measures such as the civil engineering and carpentry and so on.\(^{11}\)

Theoretical geometry was the science of absolute truths, meaning that it could be considered free of errors in mathematics or geometry. Practical geometry, however, entailed compromising absolute truths while implementing them in matter—e.g., there is no way to create things in the material world with the same level of absolute accuracy as exists in the ideal realm of theoretical geometry. There was always an element of approximation in erecting a building to a desired form, or in creating

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\(^{10}\) Theorist Marco Frascari in class, and his other communications also repeatedly mentioned this notion.

\(^{11}\) Al-Farabi, 1996: 64-65. Translation from Arabic version of *Ihsa al-Ulum* by Mohammad Reza Jozi.
ornamental patterns on revetments without involving some degree of compromise. This was indeed a subtle approximation, a *hyla* or trick, to make it happen in the world of materials.

Bier and Kheirandish also inform us of the significance of the concept of "demonstration" (*mithal*) in sciences, including mechanics and optics. They compared the two in the following way: "For both disciplines the concept of demonstration is crucial, but carried out differently in practice. Optics was primarily a "demonstrative" science, bringing together natural philosophy and geometry in a way that led to the development of experimentation as a scientific method, while mechanics was more of a "productive" and "constructive" craft, employing models as well as illustrations."¹² This understanding of the role of geometry as a means of demonstration and production is also vital to better understand the nature of *ilm al-hiyal*—that is, a field that requires demonstration—making it a science whose knowledge is associated with "showing" and "seeing," thereby linking it to the essence of Greek *theoria*, (derived from *thea*, seeing). Additionally, considering that *ilm al-hiyal* mediates between absolute truth and untamed erroneous matter, this field also entails attributes of the imaginal.

It was in this context that treatises for craftsmanship were written under the supervision of scientists and geometricians to be used as manuals at work. Among those manuals were treatises on architecture, dam construction and irrigation, tool-making, and practical geometry.¹³ These were mainly "how-to" manuals for those who would make things. A group of these technical treatises are identified with specific types of craftsmanship such as weaving, book making, ceramics, and so on; others are devoted to areas of practical geometry. The importance of the practical (or applied) geometry is in its demonstrative power and its availability as writing on architecture.

In the absence of historical treatises on architecture, these technical treatises, along with a few surviving treatises on practical geometry (e.g. Al-Buzjani’s treatise) and surface measurements (e.g. Al-Kashi’s treatise), and books of history (which will be reviewed later) are the major documented sources for the study of architectural subjects, including the visual culture of pre-18th century Islamic provinces.

One rare 10th-century source, Kitab al-Ba’d wa al-Ta’rikh (The Book of Creation and of History), which was composed in 965 by Mutahhar b. Tahir al-Maqdisi from the city of Bust of Khorasan or Transoxiana, is perhaps the first known written document on the practice of architecture. It is significant in that it features a relatively detailed explanation of the process of erecting a building.

The author dedicated one chapter to an argument on the existence of God, as evidenced by the statement that “no creation is possible without a creator.” Interestingly, in it al-Maqdisi “compares the creation of the universe with the construction of a building, the making of a ship, and the weaving of a cloth. None of these existing ‘things’ are possible without a maker, and thus the existence of the universe presupposes the existence of God.” This comparison will appear frequently in the words of theologians such as al-Ghazali and many other subsequent authors, artists, and architects and provide cosmological readings of architecture. Grabar translated these pages as follows:

If it were permissible to imagine the creation (huduth) of this world without a creator (muhadith), it would in fact be possible to imagine the existence of building (bina) without a builder (bani), of a piece of writing (kitabah) without a writer (katib), of a design (naqsh) without a designer (naqqash), of an image (surah) without a painter (musawwir). It would, in fact, be permissible to the one who sees a solid residence (qasr) and in firm building

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14 Ibn Nadim, Muslim scholar and bibliographer of the 10th century (d. 998?) mentioned a number of treatises on architecture, bridge making, … in his Kitab al-Fihrist (Book of the List or Book of the Catalogue). Among them include: Ibn Haytham’s Kitab al-abniya wa al-uqud (The Book of Buildings and Constructions) and, Al-Karaji’s Kitab Uqud al-Abniya (The Book of Architectural Constructions) which unfortunately none of them survive. Al-Karaji also wrote Kitab Inbat al-Miyah al-Khafiya (Book of the extraction of hidden waters), which is known as the first book on hydrology and water extraction. His diagrammatic illustrations, unlike architectural geometric patterns that seem very abstract, are more realistic and closer to the physical world.
(bind) to believe the following: (1) a pile (kumah) of earth (turab) was gathered together without a gatherer (jami‘); it was then mixed (akhralata) without a mixer until cohesive (alftaffa) and moist (nada); (2) then it was molded (ansanaka) into a brick (libn) of perfect proportion (taqdir) and admirable squareness (tarbi‘) without someone to plan it in advance (sabiq) and to fashion it (darib); (3) then the foundations (asas) of the residence (qasr) laid themselves out, its footings (qawai‘d) strengthened themselves (tamakkana), its pillars (saqat) and transoms (‘araq) rose up,15 so that its walls (haytam) could be extended (tawala) and its corners (arkan) completed; and mud bricks (libn) flew into the air, landed on their (proper) sides (tarakamat‘ala hawdshiha), and arranged themselves in the most beautiful order; (4) then joists (judhu‘) and beams (jawa‘iz) fell on their own according to the measurements of the apartments (buyut) and of sectors (khita‘) and were cut for building without anyone gathering them (trees) and cutting them; (5) then [wood] was hewn (antajara) without a hewer, sawed (antashsara) without a sawyer, smoothed (asfana) without a plane; when [these wood pieces] are completed, then uneven parts straightened out, they rise on their own grooves (mughariz), transform themselves into ceiling over rooms (buyut), and their pillars (asatin) rise under them; (6) then a sheathing (safa‘ih) covers them (ceilings), doors open and close on their own; (7) then the building is covered with lime (takallasa) and mud (tasayya), paved (taballata) and plastered (tajassasa); it is decorated (naqqasha) with different kinds of ornament (tazawiq) and designs (nuqush). And so the work is finished, the building completed, its separate parts united in the best fashion and the most perfect arrangement. Not one of its partitions, bricks, or wooden beams appears without the viewer’s admiration for its wisdom and its purpose, all of this without the maker (fa‘il) who made it, the fashioner (sani‘) who fashioned it, the expert (sa‘i) who formed it, the planner (mudabbir) who planned it!

15 Grabar and Holod add the following as footnote in regard to the translation of these words: “these two words are difficult to interpret. Saqat may be taken to mean tree trunk, whereas a‘raq (sing. ‘araqah) means “transom between two courses of brick stone.” In this context, the author is referring to a process of half-timber construction where the wood frame is raised before laying in brick.” See: Grabar and Holod, 2005: 315. In Grabar O. 2005.
Although learning about the seven major stages that were involved in erecting a building during the 10th century is quite elucidating, this text is particularly significant to the present study in three ways. First is learning about the practice of erecting a building at a time when architectural practice was considered under the *ilm al-hiyal*. One could imagine that in every stage the magical practice of geometry in perfecting the raw material according to an ideal form is present. The author’s mention of the “perfect proportion” and “admirable squareness” of brick indicates the significance of the degree of success of applying pure theoretical geometry to untamed raw mud in order to achieve an ideal shape. Once this is accomplished, the building expresses the “wisdom” of the makers and the *mudabbir*. In this sense the term denotes the same meaning as *mohyl*, a person who knows how to practice *hyla*, since both of them represent an act of remedy or recourse. Also, implicit in the excerpt is the reference to the presence or necessity of drawing for a building: “…without someone to plan it in advance (*sabiq*) …” Planning in advance for perfect proportion and shapes involves drawing and demonstration. The second issue relevant to this study is that geometric ornament is likely the last stage of the building process—the stage during which plasterers make a surface for *girih* to appear. The third issue is the analogy between architecture and divinely-inspired creation—that God set the stage for well-proportioned architecture at that time. In this regard, the use of poetic language such as “rise of the pillars,” “fly of the brick into the air,” and “proper landing” to “arrange themselves to the most beautiful order” is also of importance. This reveals the poetic and high status of the practice of architecture. Such praise words for God’s creation with metaphorical references to architecture are also found in the 17th century Ottoman architect, Cafer Efendi:

In Praise of Divine Creation
What is this exalted mosque and retreat for witnessing?  
What is this lofty vault and lamp ornament?  
What is this bright window, what is this luminous taper?  
What is this wonderful creation, and what is the beauteous form?  
What is this vault of heaven, and what is this surface of the world?  
What is this lofty arch, and what is this great pavilion?  
What is this? Who made such an edifice?
Without drawings and without mathematics and without analogy?
How can a person describe this pure creation?¹⁶

Once again, poetic language elevating the state of physical crafting to celestial creation almost over six centuries later would verify the spiritual atmosphere surrounding architecture. In another reference to visual representation in Islamic culture, Cafer Efendi stresses the importance of drawing and mathematics (above, line 9)—in other words, geometry—in the creation of architecture. I can infer that Cafer Efendi assumed an inherent relationship between analogy, mathematics, and drawing in the sense that without analogy (to a higher creation), mathematics would not be able to play a meditative role to execute architectural drawing. The geometric mode manifested in the ornament and arabesque is recognized as the main unifying characteristics of Islamic architecture across time and regions.¹⁷

The Geometric Mode of girih

Widely known as girih or aqd (the Arabic term for knot) in early surviving treatises, girih is a geometric mode of abstract interlocking shapes and patterns, which first emerged in the 10th century. Surviving treatises on practical geometry that date back to the 11th century demonstrate sophisticated lessons for architects on how to achieve different modes of girih.

The surviving evidence of girih as architectural drawing from the 13th century shows the design of a muqarnas incised into a plaster tile.¹⁸ The drawing demonstrates interlocking geometric patterns of a quarter of a vault in two dimensions. The drawing is framed with care, although some repeating inscribed lines are visible in the drawing, which seem to be some working/sketch drawings of the time.

⁷ One compelling reason frequently noted by many authors with regard to why Muslims favored geometric modes over other possibilities of representing realities is attributed to religious reasons. While not expressly indicated in the Koran, secondary sources discouraged Muslims’ use of figures, statues, and realistic paintings in their residences, particularly in rooms where they performed prayers. These restrictions are linked with the reasons that Muslims use abstract modes of representation, which are found in geometry.
⁸ Muqarnas is referred to stalactite-like structures suspended from vaults or cradle-vaults in the Islamic architecture. Muqarnas is non-structural and is added as a second ornamental layer to the building. Its main function is visual elaboration in vertical progression of domical and entrance spaces.
inscribed drawing suggests that the practice of representing relatively complex three-dimensional structures in two-dimensional plans was a well-exercised practice at the time. Constructing such relatively sophisticated spatial forms in two-dimensional drawings required a high level of geometric knowledge and imaginative perception to visualize the drawing in three-dimensional space (Fig.2.1).

![Fig.2.1](image)

Fig.2.1. Plan of muqarnas on a 13th-century incised plaster slab showing a quarter or half of a muqarnas vault (Deutches Archäologisches Institut, Abteilung, Teheran). Source: Necipoglu, G. 1995.

When paper was introduced to the Islamic region in the 11th century, it replaced weighty, rigid plaster. Due to its convenience, it gained favor as the preferred medium of drawing. Moreover, paper drawings demonstrated a much higher level of sophistication in design and in representation.19 According to Necipoglu, the master builder and architect of the time found paper to be a medium that allowed him to exercise more intricate forms and achieve higher level of structural sophistication. When comparing 15th century surviving geometric drawings on

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paper with the earlier drawing on plaster, Necipoglu indicated that “their sophisticated draftsmanship and color-coded graphic conventions testify to the advantages of paper over plaster, an observation confirmed by comparing their detailed muqarnas drawings with the simple muqarnas quarter vault projection scratched on the Ilkhanid plaster tablet from Takht-i Sulayman.” 20 The visual representation of girih on paper involved the use of color, the easier use of drawings tools, perhaps the first use of the compass, and various codified line types. Paper also permitted the architect to use more sophisticated tentative un-inked “dead drawings” as a regulating underlying grid system, than what plaster offered.

Treatises on practical geometry mainly addressing issues concerning ilm al-hiyal, (a subcategory of practical geometry), which provided craftsmen and architects with essential “how-to” knowledge of working with geometric shapes and figures. These treatises were mainly written by mathematicians and geometers, and were simplified forms of theoretical geometry explained in a practical manner to be used in the realm of the phenomena. One surviving example is Kitab Fima Yahtaju Ilaihi al-Kuttab wa al-Ummal min ’Ilm al-Hisab (A Book on Those Geometric Constructions Which Are Necessary for a Craftsman) by Abul Wafa Muhammad al-Buzjani (940-998), a Persian polymath, mathematician and astronomer of the 10th century, who lived most of his life in Abbasid’s Baghdad.

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The book includes twelve chapters, as well as an introduction titled: *On Understanding the Straightedge, Compass, and Square*, which discusses the importance of using accurate tools for facilitating the truthfulness of geometric practices. His book is the first known manual on drawing and on drawing tools in Islamic culture. His use of language, for example, in “truthfulness” of a straightedge implies an expectation beyond a merely physical accuracy of the drawing tool—attaining an ideal straight line. To measure the accuracy of the straightedge, however, he suggests an experimental method: to draw a line with an edge and repeat the line with the same flipped edge. Once the two lines fully overlap, then the straightedge is truthful.

Al-Buzjani devotes several chapters of his book to describing various methods of drawing polygons within a circle. Chapters 3, 4, and 5 discuss in detail how to draw polygons within a circle and vice versa using a correct method. In fact, at the beginning of his third chapter, al-Buzjani disapproves of experimental methods of dividing a circle’s perimeter to equilateral shapes. Instead, he argues for an accurate and methodic calculation, as articulated below:
It is prevalent amongst craftsmen that when they want to draw a polygon in or on a circle, they experiment with the leg distance of a compass and mark the circle’s perimeter several times in order to find the numbers of divisions on the circle. But this way of dividing [a circle] is not acceptable for architects-masons, prudent individuals, and master craftsmen. Dividing the circle using the above method is not only a very difficult task, but the points of division are also approximate and are not accurate. Therefore, the preferred act for architect-masons and masters of craft is to conceive it in a way that ensures that the length of the polygon is identified first. …

Al-Buzjani’s method of drawing polygons and shapes within other shapes can be considered as one of the earliest documents that was used in practice by architects and craftsmen. In fact, it can be considered as the fundamental structure and grammar for the interlocking geometric pattern, *girih*.

![Fig.2.3. Examples of Buzjani’s suggestions for drawing equilateral polygons using a compass. Drawings recreated by Jazbi. Source: Al-Buzjani and Jazbi. 2005.](image)

An anonymously-authored attachment to al-Buzjani’s treatise provides glimpses to the depth of geometric pattern discoveries in the 11th to 13th centuries. Most likely added to the al-Buzjani’s treatise in the 12th century, the *Fi Tadakhul al-Ashkal al-Mutashabiha aw al-Mutawafiqa* (On Interlocking Similar or Congruent Figures) introduces about 110 various *girih* patterns. Necipoğlu’s study of the hand-written manuscript (now housed in the National Library of France in Paris) suggests that this is a copy of an original version, as the drawings do not have un-inked lines in their execution. This treatise shows that “the *girih* mode was conceived of a system of proportionally related geometric patterns harmoniously interlocking with one

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another.” It also provides descriptions as how to draw patterns, and in a few instances demonstrates the use of the drawing tool in executing the drawing. Such verbal and visual instructions also verifies that the target audience of the book was not mathematicians and geometers—but rather artisans and architects who had to apply those in their geometric designs.

Fig. 2.4. Example of pages of an anonymously authored practical geometry titled fi Tadakhul al-Ashkal al-Mutashabiha aw al-Mutawafiqa (On Interlocking Similar or Congruent Figures) explaining execution of the girih in Persian language, c. 13th century? (National Library of France).

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A variety of practical geometry treatises from the 10th to 13th centuries has been reported by historiographers. These tended to be how-to treatises mediating between the scientists-geometricians and "architect-engineers." In fact, historical sources support hierarchical levels of practicing geometry among geometers, architects, and masons. Al-Bayhaqi (1100-1169), a Persian historiographer and biographer, cited the astronomer and mathematician al-Isfizari (d.1123), who regarded the science of geometry as the foundation that "architects and bricklayers had to follow." Another entry about the geometer al-Hakim Abu Muhammad al-'Adli al-Qajini "establishes a hierarchy based on the differing levels of geometric knowledge required from the designing architect and the mason executing his designs; the architect with his practical knowledge of geometry follows after the theoretical geometrician, and the bricklaying mason comes last. The same hierarchy is mentioned in the thirteenth-century ethical digest of Nasir al-Din al-Tusi," who himself was a polymath, mathematician, and a great mystic who embraced and promoted Sufi teachings of Ibn Arabi—particularly the idea of mundus imaginalis.

This shows three levels for the use of geometry: at the highest rank was theoretical geometry, whose role was to discover and verify absolute truths in the realm of ideality. The second level, representing practical geometrical treatises, was for the architect-engineer whose major role was to apply through approximation and "tricks" the universal truths of the arithmetic to the material world. The third level, which represents the practical level of the site work and construction materials, is used by masons, carpenters, and other artisans directly involved in the construction. This triplicity of geometry also indicates the role of the architect in preparing architectural drawing—which is to say, conceiving architecture on paper, as well as the mediating role the architect would play in negotiating any universal truths of the geometry to the site work. This hierarchical understanding of the geometry also corresponds to the Aristotelian hierarchy of theory, practice, and production. Such understanding, in which a mason's level of geometry is distinguished from that of the architect, corresponds to Cafer Efendi's poem in associating drawing and

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23 Necipoglu used this term to denote the then conception of the meaning and role of the architects.
mathematics as the architect’s role. These three levels of the use of geometry correspond to the three levels of the intellect, imagination, and senses.

A-Buzjani’s treatise and the anonymously-authored treatise (i.e., *Fi Tadakhul al-Ashkal al-Mutashabiha aw al-Mutawafiqa*) represent intellectual efforts of a period of flowering and fecundity in the geometric mode of *girih*. This period started from the 10th century and roughly lasted to the 13th century. It was a period during which new forms of *girih* were explored and discovered by or in association with geometricians. It was a period that the light of intellectuality of mathematics became apparent in the development of *girih*. These anonymously-authored geometric patterns represent a high level of sophistication in the pattern development, which if viewed as a catalogue represent a relatively large spectrum of *girih* possibilities, although not all were used in future building practice. This could be an indication of a desire and intention to explore the geometric possibilities in carrying “ideal” qualities.

Geometric insights from the “ideal” world of “inside” contributed to the progressive developments of new and complex geometric modes during the 10th and 11th centuries—as did forces from the “real” world of the material “outside.” Architecture of the pre-tenth century was almost colorless; “Between the tenth and the eleventh centuries the absence of color had forced designers to invent more complex geometric patterns executed with a variety of brick and terra-cotta shapes cut in complicated forms and laid at multiple angles to each other.” It is very tempting to say that it was the imaginative desire of architects for revealing beauty, according to the widespread Ibn-Haytham’s aesthetics, in which light, color, and proportion were defined as three elements that independently form the subject-object relationship capable of producing beauty, that led them to explore more sophisticated geometric patterns—in other words, a substitution for color. This moment in the history of geometric design is an informing one when looking at its context. Since paper was available, architects had the luxury of drawing more sophisticated forms—perhaps using color in the execution of those drawings—but they did not have the technology to apply color to the outside world. Therefore, they took the inward way, creating more complex forms. For that they chose to execute

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underlying grid systems. The regulating grid systems used in the geometric decorations of central Asian monuments between 10th and 12th centuries were identified in six basic grid systems. Necipoglu explains that Balkanov’s study of the evolution of colored glazed bricks points to the 11th century for the emergence of color in architectural revetments. “Beginning with the introduction of turquoise in the 11th century and culminating in a wider color range by the 14th century, had brought about a standardization of geometric ornament.” The culmination of this time period also corresponds to the beginning of the second period of girih’s life/evolution.

In considering the larger cultural context of the first period, one recognizes the authority of sciences and to a great extent philosophical thought. Specifically, I am referring to Neoplatonism whose prominent representatives were such philosophers as al-Kindi, al-Farabi, Ibn Sina, and to some extent, al-Ghazali. The ethos of this era advocated the rational mind with partial involvement of the poetics of mysticism to shape and guide geometric design. The geometric mode of this period both solved problems in material making, but also held transcendental attributes.

Necipoglu recognized a second period in the life of girih and the geometric mode, which roughly started in the 14th century and continued to early 17th century. The major change in the development of girih in this period is that the earlier process in which new forms of girih were continuously explored and generated seems to have stopped—or at the very least slowed down precipitously. Architect-engineers

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26 These basic grid systems were identified by Rempel (1961) as: i. square ii. square and its derivatives iii. semisquare and its derivatives, or the double square iv. equilateral triangle and its derivatives v. combination of equilateral triangle and square vi. the radial grid. For a detailed discussion on this see Necipoglu. 1995: 13. Original source: L. I. Rempel, Arkhitekturie ornament Uzbekistana (Architectural Ornament of Uzbekistan). Tashkent, 1961.
28 ibid. 13. The widespread use of ornaments with possible use of color is also recorded by Ibn Khaldun in the 14th century. Although the travel map of Ibn Khaldun indicates that he traveled in west Islamic lands, (Tunisian, Morocco, Spain) even in that area one could see that the use of ornamentation, most probably in geometric forms (Ibn Khaldun did not mentioned any further details on the type of ornamentation. Ibn Khaldun sees the necessity of craft of architecture to make a shelter, however he distinguishes between those who care for their buildings and those who do not, as the former group “make their walls of stones, which they join together with quicklime. They cover them with paint and plaster and do the utmost to furnish and decorate everything in order to show how they are concerned for their shelter.” See Ibn Khaldun, 1967: 320.
increasingly adopted selected patterns, representing ideal patterns. Certain patterns that existed in *Fi Tadakhul al-Ashkal al-Mutashabiha aw al-Mutawafiqa* are not found in the extant buildings and drawings of the second period. Instead, the adopted patterns were often made more elaborate with additional details.

Noteworthy is the fact that the second period of *girih*'s evolution corresponds to several cultural factors in the broader context of the Islamic region. It is a period during which ideas concerning mysticism become widely disseminated. In fact, some of the notable mystics emerged in this period, whose writings became popular; among them are Suharwardi, Ibn Arabi, and Nasir al-Din Tusi. Although different in some details, these mystics shared a common understanding of notions such as the visible world (*shahdat*) and invisible world (*ghayb*), the limitation of reason in fully perceiving the divinity, the heart as the central organ of understanding and a conduit for a direct relationship with God, and imagination as a noetic faculty capable of making such mediation possible. Shared among them, along with other theologians, was the conception of God being the “center” of the world, namely the “circle.” Burkhardt and Nasr attribute the Islamic conception of Unity in Diversity manifested in centralized geometric forms to such mystic interpretation of the Creator and Creation. In this regard, Ibn Arabi’s imaginative description of the God-world relationship, which is analogous to geometric forms, is informing. As described in the previous section, Ibn Arabi compares the divine essence to the center of a circle and the world (hence part of the divine) as the circumference.

One other major change with respect to the practice of developing *girih* was that in this period the ethos of most Islamic courts was “literary criticism,” meaning that literature began to take on greater importance than the sciences and mathematics. Courts developed their own scriptoria through which a group of literati elites would interact with each other in difference disciplines. Literature and poetry were increasingly becoming the center of Islamic culture. Among various forms of visual arts included illumination, calligraphy, painting, and *girih* pattern making.\(^{29}\)

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Mathematics—although not retaining its former high status of centuries past—was still well regarded since it was essential in making the material world proportioned. This influence of geometric proportion is visible in calligraphy, poetry, and music—all of which use geometric proportion to make their art or craft more harmonious and beautiful, typically involving the circle. It must be mentioned that craft for them implied a broad range of mental and physical activities. Poetry was regarded as craft; writing had to have perfect appearance, whose letters would be in harmony with a circle or portions of a circle. El-Said and Parman also related the circle and point as major generating agents behind beautiful calligraphy and lettering. They refer to Islamic calligrapher of Abbasid period Ibn Muqala (885-939/940), who also became a vizier, as the first to adopt geometric methods to make Arabic lettering proportional. Core to this method was the use of point and circle and letter alif proportionally, in that “the ratio of the thickness of alif to the length of that should be 1:8.” Other letters would follow similar rules (diameter of circle) or as curved following circumference of the circle. Similarly, the value of proportionate craft was seen in poetry with harmonious major identified modalities (maqam). The relationship between poetry modes and geometric forms generated in a circle is also explored by El-Said and Parman.


A limited series of geometric architectural drawings have survived from this period. These drawings were generated on individual papers and then were glued together in the form of a long linear ribbon. They were then made into scroll form, usually tied with a leather band. Although only a few examples survive, the scroll tradition is known as a dominant practice in architectural representation from that time onwards, a tradition that continued until the onset of the twentieth century. Necipoglu speculated about the very limited number of existing scrolls, despite their widespread past use. She cautiously concluded that it might be due to the secrecy of the practice and that it needed to remain with the engineer-architect. In this regard she refers to an imbedded text in one of the drawings in the Tashkent scroll in which the architect challenged his peers to make such drawings (Fig. 2.6). This could be a reason why only a few were handed down to subsequent generations and still exist today.

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31 The inscription is translated as following: “May it be known to the friends who are practitioners of this craft [art] that in counting this muqarnas it is necessary to pay careful attention so that you may know about it as it ought to be and not think that this [fellow] might have made a mistake.” Translation by Wheeler Thackston quoted in Notkin 1995.

32 Necipoglu speculated that secrecy or jealousy could have been a reason for masons and architects to preserve their scrolls. This speculation could be partially verified by the story of muqarnas drawings of Asgār Sha’ābāf a late traditional mason whose father, Muhammad Sha’rābāf, and grandfather, Master Abbas Peyvand (d. 1945) were also well-known master architects. Mohammad Sha’rābāf is reported to have collected scrolls but did not even show them to his son, Muhammad Sha’rābāf. Pournaderi mentioned: “Haj Mohammad had prepared scrolls of various types of girih and kar-bandā from since he was a child and young from his father and other masters that would review them based on necessity, but [he] had never shown them to anybody.” (trans. Hooman Kolijji for this see: Pournaderi, H. (2000). However, one other reason could be that these drawings and pattern were already well memorized and became malaka (habit, or in Ibn Sina’s sense: Habitual reason, which is a quality of soul with abstractive power) for the master builder and he could re-produce it at any given time, therefore there did not seem to be an urge to preserve the drawings. In a manual book the son, Asgar Sha’rābāf, prepared for the Iranian Cultural Heritage Center (ICHC) he explained various types of girih and muqarnas patterns and the ways they did figure out the forms (using drawing tools) on site constructions.

One other reason could be that drawings were buried in the building, a theory that definitely requires study. One rare story, dating back to about 12 years ago in south Tehran, parallels such an hypothesis; when a master mason was finishing restoration of a mimhrab’s muqarnas, he contacted the major contractor and other involved patronage and recorded all their names on papers along with the drawings of the muqarnas, taped them, made a scroll, put it in a metal pipe and sealed the sides. Then he buried the metal pipe between the muqarnas surface and the structural masonry. When he was asked for the reason, he explained that it was a common practice among his forefathers, and it have been a tradition “ever since.” The mason indicated that in the past his father and grandfathers would put the scroll in a clay vase and then sealed the top of the vase and they would bury it. This rare insight was explained to me by Prof. Khamjani, a former professor of Historic Restoration of Shahid Beheshti University, Tehran, who directly worked with the abovementioned master mason, and also observed the works, and interviewed a number of master masons of their last generation. He also explained that in a visit to the late master mason Akhund Mohammad Khorrami (Yazd, Iran) to give copies of the
My conjecture as to rarity of plan drawings share common grounds with Necipoglu—that they were kept as a secret guide away from the construction site. I also think that many of them, as well as geometric pattern drawings, must have been consumed during the construction. One last thing regarding plan drawings is that since they seem to be simple in nature (i.e., lines following a grid system, which would change from one site construction to another) is that they were drawn and used for guiding construction at the level of laying a building's foundation. Once the first rows of bricks were laid down on the site, the need to keep plan drawings for the remainder of the construction process did not seem necessary. That could be the reason why plan drawings have not survived in great numbers.

The scroll drawings were often colorful line drawings, and different spatial or construction lines were coded with different colors. Red, ochre, blue, and green are
among the colors that are found in these drawings. Such indexical drawings, compared to the monochrome drawings of western architects, could potentially speak to the sophistication of the spatial imagination of the drawing. The size of these scroll drawings are typically between 12 cm to 38 cm, which is a workable and controllable size, considering that they would use tracing boards on site for executing these drawings. The length would vary depending on the quantities of drawings but could extend somewhere around nine meters.

Limited in their scope of rendering revetments, these drawings depict excerpts of a whole. It is rare to find one whole muqarnas drawing or an entire revetment/tablet drawn in these drawings. Rather, they are all drawn partially and in segments that are repeatable. Unlike contemporaneous drawings from Western traditions in which building were represented in plan, elevations, and after Filarete even in section-perspective, these geometric drawings do not show the entirety of the building or order of construction—plans are elevations are essentially absent. Rather, they tend to refer to parts of a building, mainly pertaining to architectural revetments, the most sophisticated of which are two-dimensional representations of muqarnas spaces or squinches of vaults. Strong parallels can be made between abstract geometric drawings from the Islamic world and pre-Renaissance (particularly Gothic) drawings of the West in the sense that they both rely on geometric designs with a proportional relationship with the actual scale. Neither of these representational conventions use measured drawings. Extant Gothic sketchbooks demonstrate (particularly the French tradition of stereotomy) that their approach to design drawing was more geometrically abstracted. Significant in both these medieval
traditions is that these geometric drawings were the mason’s “way of visualizing potential architectural forms within certain geometric figures.” 

Through a minimum inventory of geometric shapes, medieval Islamic architecture was able to achieve a maximum diversity of forms.

Giyath al-Din Kashani (1380-1429), also known as al-Kashi, a Persian mathematician and astronomer of the 15th century wrote a *Miftah al-Hisab* (Key of the Arithmetic) for artisans and craftsmen. In that book, he devoted his ninth chapter, *Risalih Taq va Ajaz* (Treatise on Vaults and Cradle-Domes), to arches, computation, and calculus, and also mensuration of the muqarnas area. Although it has been mentioned that the use of the book was mainly for court supervisors to control construction costs and for tax purposes, it would be reasonable that such a level of computation and knowledge of drawing of arches and muqarnas could have been available for the architects of the time.

![Fig.2.7. Facsimiles from *Miftah al-Hisab* of al-Kashi demonstrate various ways of arch drawing along with computational matrixes. Right page demonstrates the second arch type. Source: Jazbi. 1987.](image)

broader temporal scope, we can see that Renaissance itself has already made a big shift in making the status of architectural drawing be more transparent.

After the 16th and 17th centuries, a third period in the life of girih is distinguishable. While the use of geometric drawings after the 15th century has frequently been reported, vegetal ornaments became widespread and sometimes replaced the geometric girih in revetments in this third period (Fig.2.8).

Drawings of Mirza Akbar, a late 18th century Qajar royal architect, shows the continuum of the girih drawings from earlier centuries. Necipoglu, however, indicated that the drawings of the 18th century are simple and less sophisticated compared to those of the 16th century. Use of grid patterns as underlying regulating geometry for many of the geometric patterns also indicate that repeated use of certain patterns in a simplified version had reduced 18th century architects’ use of the compass, not to mention dead un-inked construction lines (Fig.2.9).

This brief overview of the history of the visual culture in eastern Islamic lands verifies the non-transparent relationship between architectural representations and the actual buildings. Since early centuries (as early as the 9th century), architecture was
conceived of as providing more than just material shelter; rather, it was capable of performing symbolic and representational roles. The process of conceiving and making architecture, along with alchemy in certain eras, was a magical act that required a translation of the universal mathematical intelligibles into the confined realm of phenomena by means of the ingenious and discerning power of the architect-engineer. This was indeed a creative faculty of imagination capable of modifying or transforming intelligible concepts to images proper to the exterior world. At a psychological level, imagination played a central role throughout the entire process of executing the drawing and making the actual construction. In the first period of *girih*, Neoplatonic interpretations, along with prominent Islamic aesthetics of proportion and light (e.g. those of the Optics of Ibn al-Haytham and al-Ghazali’s teachings on beauty, love, and light), elevated the *girih* into the realm of metaphysics. Perceiving the beauty of a work of art resulted in a “sense of pleasure” and “moving heart”—an intellectual-bodily experience that can be compared to an indexical relationship with the beauty concealed within the work.\(^3\)\(^8\) This beauty was both sensorial and intellectual. Informing this discussion is Gadamer’s discussion on the ontological oneness of the beauty and its mediating role: “… beauty has the most ontological function; that of mediating between idea and appearance.”\(^3\)\(^9\) That is how in *girih*, the beauty is integrated with both the visually aesthetic proportional design of the geometrical appearance and a supraterrestrial concept.

With the dissemination of Islamic mysticism, which is known as Sufi, geometry gradually lent itself to mystical interpretations, a realm inextricably linked to the realm of imagination and individuals’ imaginative faculty. The metaphysics of imagination discussed by mystics argued for the imaginal nature of certain experiences, such as the incarnation of angels (i.e., Gabriel) in bodily form.\(^4\)\(^0\) At a broader level, the imaginal level was described as human experience in true and visionary dreams. This is the second level of the imaginal that allows the artist to

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\(^{38}\) Looking at the three types of sign discussed by Pierce Sanders: icon, index, symbol, I speculate that “pleasure” and “move of heart” can be interpreted as a sign (index) for the existence of beauty in the context of the Islamic world. For a study of indexical relationships see: Peirce, C. S., Nathan Houser, N. and Kloesel, C. J. W., 1992.

\(^{39}\) Gadamer 2004: 467.

\(^{40}\) Ibn Arabi uses the example of Gabriel’s presence in human form as the most obvious stage of imaginal presence.
participate in mundus imaginalis. Along the same lines, certain things and objects are capable of taking the viewer into an imaginal experience.

It is in this context of the second period that the Islamic visual culture, which belongs to the broader context of literary criticism, attracts the scrutiny of the courts’ scriptoria, which were highly involved with poetry and literature. Given the high number of mystic poets with spiritual dimensions in this period, it would be natural for the visual culture to be influenced by mystic and poetic interpretations.

Considering the central intellectual role that a court scriptoria played in preserving, development and dissemination of all types of knowledge, the geometric mode of *girih* became widely seasoned by mystic readings in other fields of knowledge. In addition, the persistence of such mystical views as Ikhwan al-Safa on cosmological attributes and the purifying role of geometry opened a gateway to knowing the substance of the soul, in that era the mystification of the *girih* mode grew. Therefore, a mystical understanding of the geometric form would seem likely—especially amongst the number of literati and higher ranked architects of this period. A number of the architects of this period are also known primarily as philosophers and polymaths. Included among them is Baha al-Din Muhammad Amili (1547-1621), who designed Shaykh Lutfullah mosque (and other edifices) in Isfahan in the early 17th century.

After the 17th century and particularly after the 18th century, forms of *girih* were already well-known among architects and masons. Most of the *girih* patterns were kept in scrolls as design exemplars by the architect-engineers. The extant drawings from this period, as well as architectural revetments, demonstrate repetitions of major patterns—with the occasional inclusion of some elaborative embellishments. Apprentices learned these patterns and recorded them in the their own scrolls. Execution of such drawings entailed imaginative participation of the architect-engineer at work. Although this period observed a high level of elaboration in muqarnas, in general no significant innovation or discovery in terms of forms can be attributed to this era. Instead, this period can be marked by the use of various materials—tile work, woodwork, gypsum ornaments, and mirror-work—in manifesting the *girih* geometric patterns. These patterns were, however, somewhat
a repetition of those inherited from the second period, and subsequently from the first period as explained above.

Stages of *girih* Evolution

Three stages define the evolution of *girih*: beginning with a more intellectual mode of geometry, to becoming elaborated and mystical, and then to catalogue their patterns. It is tempting to draw a parallel between the three major phases of architectural representation of *girih* and the three realms of intellect, imagination, and the senses. The first period, which is marked by close interaction between architects and mathematicians, coupled with the science-oriented ethos of the Islamic world, could correspond to a realm in which the geometric mode of *girih* was mainly conceived, nurtured, and developed under the guidance of mathematical sciences. The influence of the intellect in configuring *girih* is well evidenced by the frequency of treatises on practical geometry. One could infer that it is a period during which geometric drawing becomes associated with the human intellect. From the mid-12th century up to the 16th and early 17th centuries, ideas of mysticism were widely disseminated. Although early accounts of mysticism can be ascribed to mystics of the period, e.g. al-Ghazali in the 10th century who related artistic activity to divinity, mystic thought became widespread in later centuries. Throughout the 12th and 13th centuries—a period that corresponds to the emergence of prominent mystics as Ibn Arabi and Suhrawardi—geometry was also gradually conceived as a medium not only capable of directing humans to higher levels of intellection, but also able to facilitate mystical interpretations. The post al-Ghazalian Islamic era, which culminated in the Safavid period, was becoming more mystical. As a result, various forms of art including those relying on geometric modes were opened to mystical interpretations. The popularity of *Ihya al-Ulum* of al-Ghazali among artisans and craftsmen is an indication that esoteric conceptions of Islamic art as a form of sacred practice was not unlikely. Concurrently, earlier explorations of the 10th to the 13th centuries for new forms of *girih* already created a large catalogue of possibilities to be included into the scroll drawings. Necipolgu’s observation, which asserts that in this period certain *girih* modes enjoyed more elaboration and were frequently
used as “ideal” patterns, could support the notion that the early phase of production entered a course of careful selection and embracing—a process that involved the new ethos of mysticism.

The second period corresponds to the integration of geometric form and mysticism, a process in which the inner faculties—and above all the noetic faculty of imagination—were central. Towards the 17th and 18th centuries, various geometric patterns were already in use. Vegetal patterns emerged as the new popular “realistic” representation mode and cause a decline in the quantitative, and perhaps the qualitative use of the geometric mode of girih. The geometric patterns were no longer maintained in this second period of sophistication, evident in Mirza Akbar’s scroll drawings. It seems that the process of conceiving the girih mode lost its fertile period of elaboration. One could infer that popular patterns, while perhaps maintaining symbolic attributes, were just repeated here and there. It is a period during which conceiving geometric forms was no longer an intellectual activity—nor was imaginative and mystical elaboration. The emergence of the realistic vegetal representation on the one hand, and the repetition of certain geometric patterns on the other hand, makes one wonder if girih in this last period can be associated with the physical world and state of settling as visual forms not fully embracing mystical dimensions.

The second period, which is the focus of Part Two of the dissertation, represents a period during which the inner faculty of the imagination, along with mystical perspectives, viewed the geometric mode as a creative and productive mode of contemplation. Architectural conceiving involving modes of visual representation was an imaginative act belonging to that of the imaginal, as evidenced by Ibn Arabi mention of sensual visual perception being a pre-requisite for an imaginal experience. This is precisely the role that the drawings of girih and constructed modes of girih have played for centuries, connecting the sight to an understanding through geometric articulation. Girih drawing, foremost, starts with a sensory experience, visual and bodily. However, in essence it is an intellectual-corporeal practice that leads the individual to acquire essential knowledge about self (i.e. state of experiencing a microcosmic being), to experience imaginative consciousness, and
to contemplate macrocosmic potentials of the geometric mode as a symbol to lead
the individual to the unseen realm. The geometric drawing *girih*, as pertaining to
higher stages of consciousness and imaginative understanding, suggests levels of
being and becoming, that of the imaginal. It remains an ascending power of the
geometric mode that persists to our time, as evidenced by 20th-century architect
Calude Bragdon who repeatedly referred to it as the “forth dimension” of
geometry.41 This is a level in which the individual is affected by geometry, creating a
link between the designer and drawing that informs and configures each other
through an imaginative exercise. This will be articulated in the next section through
a study of the structure of and imaginative functions of *girih*.

41 Bragdon, C. 1972.
Restrictions placed on figural representation by religious tradition no doubt had encouraged designers to channel their creative energies to develop elaborate systems of nonfigural patterning. Nevertheless the distinctive abstract visual idioms they formulated were informed primarily by an aesthetic theory that privileged the imagination's ingenious abstracting capacities over naturalistic representation. The modal system of aesthetics revolved around a notion of ideal deep structures that could be transformed endlessly to create variations and derivatives. It emphasized the artist's imagination, the place where these deep structures became permanently embedded as abstractions that engendered remarkably varied products capable of arousing a sense of pleasure and wonderment.

-On Gulru Necipoglu-Kafadar

Prior to a study of the materiality, process of execution, and potential perceptions of the interlocking patterns of girih, let's briefly look into its meaning. As mentioned earlier, the term "girih" has been used since its inception in the 9th and 10th centuries. It is possible that the first uses were in the Arabic language, since Arabic was the dominant scholarly language of Abbasid Baghdad the Arabic equivalent al-aqd was used in Fi Tadakhul al-Ashkal al-Mutashabiha aw al-Mutawafiqat treatise (attached to al-Buzjani's treatise).

The etymology of the term in both Arabic and Farsi reveal various levels of meaning. Girih is a Persian term meaning knot, tie, and connect, which can be used as a name or word. According to the Persian Dehkhoda dictionary, the term is derived from ancient Persian girthi and from Sanskrit girth—also meaning engagement and marriage. Additionally, girih was a unit to measure length (about 1/15 of a meter) used by craftsmen and architects. The Arabic term al-aqd, coming from root a.q.d, also denotes expanded meanings of engagement. It also means commitment, bond, and vow. The term aqd (in form of al-aqda) also refers to meetings in theological schools in which thoughts and ideas are exchanged. Also derived from the same root is the term aqida meaning thought, opinion, and dogma. The etymological

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Necipoglu, G. 1995: 208
study of the term suggests that *girih* maintains multiple levels of meaning: a knot in the material world, knotting marriage, and intellectual commitment.

By the 15th century, the Persian term *girih* was widely used in the Islamic world, which was when Tashkent scrolls were executed: “At the time of their discovery the node of geometric design codified in these fragmentary scrolls was identified as the *girih* (Persian,"knot") by traditional central Asian master builders who still used such scrolls.” The term “refers to the nodal points or vertices of the weblike geometric grid systems or construction lines used in generating variegated patterns for architectural plans and decorative revetments in two and three dimensions (each "knot" center where a number of construction lines intersects has an n-fold rotational symmetry). Necipolgu’s depiction of the *girih* is broad and includes all the underlying grid systems that can generate plans, as in the case of the extant plan drawings of Ottoman plans of the 15th to 17th centuries, Tashkent scroll drawings of the 16th century, and Akbar Mirza scrolls of the late 18th century (Fig.2.9). This broad definition also encompasses vaulting drawings, namely *kar-bandi* or *rasmi-bandi*, and muqarnas (Fig.2.10).

Fig.2.10. Examples of the interlocking geometric patterns of *rasmi-bandi*, projected to the three-dimensional space, which can be considered under the broad definition of *girih*. Source: Buzurgmehri, Z. 1992.

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With the relatively ambiguous term “arabesque” also used to denote a certain geometric mode, one should be reminded that girih refers to a geometric mode that does not include vegetal forms. “The same master builders differentiated this mode of geometric design from curvilinear vegetal patterns governed by a less rigorous, implicit underlying geometry; the latter they identified as islimi (the spiraling ivy or vine and tendril motif), a term sometimes corrupted into islami (Islamic).” Therefore, girih is exclusively a geometric mode of nodes, lines, and planes. Given the historical context in which girih was born—an era highly influenced by the Alexandria school—this geometric mode is associated with Euclidean axiomatic geometry.

Girih can be considered as a productive agent of geometric patterns and holds both two-dimensional and three-dimensional attributes, given its capacity in generating n-fold symmetrical patterns in planar or spatial modes. Lorzadeh also mentions this re-generative capacity of girih as it recreates itself and becomes an agent for creation. It, then, is a “creative” mode capable of recreating itself in other intersecting lines, a world of possible forms remaking itself (Fig.2.11).

Fig.2.11. Diagram demonstrating girih as a creative mode constantly repeating itself and remaking itself in a larger pattern. Drawing by the author.

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45 Necipoglu.1995: 9. Some authors have used the term girih to denoted both abstract geometric patterns and vegetal patterns. For example Navaie recognized two types of girih: vegetal and geometric. See Navaie, K. 1999 , Notes on the Naghsh in Soffeh Magazine. It seems that to limit the term girih only to the geometric mode would be more appropriate. This particularly receives support when we look at the verb girih chini (lit. pattern making), which exclusively alludes to modes of geometric making in wood, ceramics, etc.

46 Lorzadeh, H. 2010.
The historical *girih* drawings that are discussed here are referred to as Tashkent and Topkapi drawings; the former constitutes fragment drawings of (two) scrolls, and the latter is to be considered the most hitherto complete set of drawings preserved in one scroll. 47 “Executed with simple drafting instruments (ruler, dividing compass, and set squares),” the Tashkent scroll drawings include “formal drawings of squared ground plans, geometric and calligraphic patterns, and ground projections of muqarnas or arch-net vaults contained in square and rectangular frames.” 48 The Topkapi scroll, however, does not include any plan drawings. These drawings have been executed only on one side of the paper. This could perhaps be due to the fact that all these drawings were meant to be vigilantly preserved in scroll form. In the absence of a binding convention for architectural drawings—not to mention the lack of reproducible print technology—there seems no compelling reason for the use of both sides of the paper. Therefore, unlike in the West where use of the recto and verso (referring to the inside and outside of the parchment), and later to each leaf of the paper, the medium of these drawings does not assume a recto-verso order. The paper medium voices one face. The representation of the *girih* is colorful; various lines have been drawn with different colors: “The polychromatic designs in both of these Tashkent scroll fragments are drawn with a reed pen in black and red ink, highlighted with orange, yellow, ocher tones, and green, often used in combination with stippling or cross-hatching to distinguish different spatial layers collapsed onto a single plane.” 49 Laden with various construction or spatially coded lines, these drawings represent a multilayered construct. Some of the drawings represent two-dimensional surfaces, while others represent three-dimensional spaces. Even in the case of two-dimensional spaces, sometimes the actual construction of *girih* was made in a woven fashion so that it appeared as if the *girih* was leaving the surface and beginning to occupy a more ethereal realm. Example of such spatial treatment, which is closer to the meaning of *girih*, is repeatedly found in various media such as illumination, brickwork, or woodwork. Other groups of the geometric mode of *girih* suggests two-dimensional ornaments as evidenced in the tile-works of Moshir mosque (Fig.2.12).

47 The Tashkent Scrolls have been studied by Balkanov 1944, 1947 and Rempel’ 1961 and the Topkapi scroll has been studied by Necipoglu.
Importantly, the abstract visual language in these drawings neither shows the entirety of the building nor the “actual” shape of the decorative revetments (rather showing merely the geometric structure), leaving the process of architectural conceiving with ample room for further interpretations.\footnote{Such style of drawing contrasts their contemporaneous tradition in the West. While the Renaissance west was exploring a more realistic rendering of the building in Vitruvian terminology of Iconographia, Orthographia, and Scenographia, drawings in the Islamic culture remained within the Euclidean geometry tradition. Perspectival views, an outcome of the human voice and presence, were becoming more dominant in the west. Perspectival drawings of Filarete, close to the representational conventions, which we use today, could be considered as first steps of making architectural drawings more transparent compared to the Islamic tradition. Interestingly, according to Necipoglu, Filarete received an invitation to visit Ottoman Empire territory. Extant plan drawings preserved in the Topkapi palace, then, could be contemplated as such interactions of the Ottoman architects with Western architects. For realistic representations on buildings see: Filarete, 1965. For a discussion of Vitruvius on ideas of architecture as they relate to three modes of representation see: Vitruvius, 1999.}
Fig. 2.13. The three-dimensional appearance of *girih* as brickwork. While literally offering a three-dimensional space, the brickwork also appears as a spatial interwoven grid (right column) Kharraqan towers (circa. 1067-8 and 1093), Central Iran.

Repeat Unit

As evident in all of the drawings, they are all quadrants or segments of larger patterns. El-Said and Parman identified the notion of “repeat unit” at work in the execution of the *girih*. These fragment drawings are also based on the “fundamental concept of the repeat unit, the fragment of an overall pattern meant to be multiplied or rotated by symmetry.” These drawings are geometric components that can be repeated for larger revetments according to their geometric properties. The repeat pattern, however, is not the basic mosaic module. It is a generative unit that in its repetition composes a larger, yet different, combination of shapes and lines. El-Said and Parman explained that this fundamental repeat unit is essential for a systematic arrangement of forms to produce an overall design. El-Said and Parman

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also discussed the significant role of the repeat unit in creating symmetry, a process that ultimately culminates in creating a perfect symmetry of radii projections approximating a circle.\footnote{E-Said, I. and Parman, A. 1976} The repeat unit, in effect, served as an intellectual tool for the architect-engineer to make patterns for larger physical spaces without a need to draw the entire pattern. Additionally, the final pattern, often times, offered a visual richness as a whole that did not exist in the fragment unit. The use of repeat units also allowed the drawing to be transformed to a variety of interpretations. For example, a quarter drawing of a muqarnas could be mirrored and make a half vault space or an entire vault. In their view, the basis of the repeat unit is often a circle.

![Diagram showing how the repeat unit constructs the geometric pattern in at a larger physical and perceptual scale. From El-Said I. and Parman, A. 1976.](image)

According to Necipoglu, other scholars such as Baklanov and Rempel also detected a standardization in the proportional systems of \textit{girih}s collected in the Tashkent scrolls, reflecting a relative simplification of geometry in the decorative revetments of the Timurid and Uzbek monuments. In these monuments, the \textit{girih} patterns are drawn in rectangular and square frames. Necipoglu observed that the shapes these frames take in the Tashkent and Topkapi scrolls “were not arbitrary; [rather] each
repeat unit corresponded to a definite proportion and could only have been applied to a surface with the same proportions, regardless of actual size.53 These geometric unit patterns, then, while seeming to be repeatable on surfaces or vaults of different sizes, were not proportionally bound to a certain space in the building. They neither were bound to any scalar link to the actual space. The final pattern (comprised of the repeat unit), however, was proportional to the actual space. Proportionally appropriate, these drawings suggest a variety of potential scalar relationships with future buildings. Proportioned drawing served as a microcosm with no scalar obedience to its potential macrocosm. This allowed the drawing to serve as an intermediary fluctuating between realms of the drawing (less material) and the construction (more material). The microcosm of the drawing is associated with the ideality of the geometry, while the actual constructed girih can be linked to the real characteristics the matter.

By conforming to the outer determined frame, the geometric interlocking forms enter the rich realm of an intellectual exercise. The presence of an outer rectangular frame necessitates proportional thinking based on a grid system. It also provides easier accessibility to the ideal larger whole, which is accessible through repeating these rectangular units. Although embedded in a square or rectangle, the repeat unit encourages the viewer to go beyond the frame in order to construct an envisionable larger whole.

Therefore, meditation on the notion of beauty and the geometric mode (discussed in Part One) is encouraged by the use of the repeat unit and the whole geometric

53 Necipoglu, G. 1995:12. Necipoglu continues: “Nevertheless, unlike the decorative revetments of the eleventh and twelfth centuries, which were custom-made for particular monuments, those included in the Tashkent scroll, he observed, were designed independently or such considerations. To Rempel this signaled that the "golden age" of geometric ornamentation corresponding to the complex level of Islamic research in the mathematical sciences was over.” Ibid. 12. This observation is also very interesting if read through the lens of the present study. As explained in the beginning of this part, the second period of girih’s life is marked by distancing from geometricians, elaboration of certain patterns, expansion of mysticism, and growth of literary criticism. The above observation can also indicate that intellectual and spiritual dimensions of girih had already become developed enough among architects that made it more abstract. That is the abstract mental and imaginative form, regardless of the actual proportions of an existing revetments became idealized. This could be an indication of the high spiritus level of girih independent from the material world, which in turn, makes the process of constructing those patterns in the world out there more imaginative in the sense, the idealized pattern, should be re-proportioned according to the actual material condition. I am tempted to associate this with ilm al-hiyal as explained by Al-Farabi and others a few centuries before such practices.
In some cases, the repeat units function based on mirroring—and not necessarily adjacent to each other. Importantly, the unity of the final form is not just a mathematical sum of the repeat units, but a new whole that is different from its composing ingredients. The final form, then, which conceals the beauty in it, is composed of smaller parts. It seems that the architect, by first envisioning the final form as a whole in his mind, as well as during the drawing of the repeat unit, would see the beauty. This process requires active imagining (at least at a psychological level) to envision the entire larger whole and to “see” the beautiful form through a “fragment” or “portion” of it. By re-constructing the symmetry in his/her imagination, the architect was able to see, absorb, judge, and even revise the *girih*. It is tempting to relate imagining process to the sign-essence discussion of the mystics—that every created thing in the world is a partial “reflection” of God’s invisible essence. Necipoglu also associated the notion of the repeat unit with a Sufi’s *dhikr* (lit. remembrance), mystics devotional act involving repetition of the Divine names, in repeating certain sermons to enter a higher level of spirituality (Fig. 2.15).

**Fig. 2.15.** Superimposed Diagram over drawing no. 41 of Topkapi Scroll highlighting repeating modules of Allahu Akbar (God is Great) in rhombuses (Allah) and Squares (Akbar). The repetition accords to the Sufi’s *dikhr*. Diagram by the author. Drawing source: Necipoglu, G. 1995: 255.

Construction of the *girih* Drawing: From Invisible to Visible

With a basic understanding of the *girih*, a creative intellectual and formal mode with planar and spatial attributes, and its anatomical notion of the repeat unit, the
architect-engineer was capable of executing these intricate interlocking patterns. While the core of the discussion here is on the girih and its use in decorative revetments, a broader definition of girih also includes the execution of plan drawings. In executing these interlocking patterns the architect-engineer needed to figure out an underlying regulating geometry based on the final lines of the drawing—an essential process in creating girih. In both the Tashkent and Topkapi scrolls, the regulating geometry (i.e., the construction lines of the drawing) are incised on the paper with a sharp tool, left un-inked as “dead” or “blind” drawings: “They [Tashkent scrolls] appear to have been workshop catalogs prepared to preserve the memory of codified two- and three-dimensional ideal patterns; these were generated by various types of underlying geometric grid systems, the construction lines of which are indicated either as inked outlines or as un-inked “dead” drawings incised on the paper surface” (Fig.2.16).54

Fig.2.16. Fragments of girih drawings from Tashkent scrolls. Construction lines or dead lines are un-inked lines incised onto paper (seen above as light lines) to determine the underlying geometry for the girih patterns. These un-inked drawings follow the repeat unit of the drawing and are comprised of straight lines and circles. From: Necipoglu, G. 1995.

In the case of the Topkapi scrolls, Necipoglu also believes that they are ideal girih patterns to be preserved and used in a variety of building types, rather than for use in a specific edifice.55 That scrolls maintained ideal patterns accords to the notion of

55 While it would be reasonable to assume some scrolls might have contained drawings for specific projects, then, perhaps, preserved as a reference, Necipoglu’s interpretation seem to be a more
mithal, a term that is associated with mathal meaning “similitude” or “parables,” suggest that the scroll drawings were allegorical exemplars⁵⁶ that could be applied in a variety of materials and buildings. The process of constructing girih so generically (i.e., without referencing any particular building) suggests a high level of abstraction and ambiguity between the drawing and the building that then required the skill of the architect-engineer and master mason. No further instructions, such as noted specifications or sectional drawings, have been found that would have been used to situate them in a specific location or to instruct the construction. We can assume, therefore, that these drawings functioned as intermediaries between the architect’s memory (quwwa al-hafiza) or the form-giving imagination (quwwa al-mutasawwirah), and the actual construction, as stated by Necipoglu:

Unaccompained by explanatory texts or measurements, these drawings seem to have served as an aide-memoire for architects and master builders who were already familiar through experience with the coded graphic language used in them. They functioned as mnemonic devices that assured the preservation and transmission of architectural knowledge over the generations. The abstract patterns codified in the scrolls could be adapted to given dimensions on the construction site where they were often traced full scale on the floor or on walls.⁵⁷

These intermediary drawings, therefore, require a full-scale realization (as part of the construction process) on site.⁵⁸ What is drawn on paper is the level of conceiving, in terms of giving birth, to a future material being. As such, the drawing resides

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⁵⁸ The process of full-scale realization on site has been described by Necipoglu as a procedure in which the architect-engineer would use a tracing board to make full-scale pattern drawings. A surviving technique among the last generations of Persian master masons, in making muqarnas structures is revealing. In this technique, the full-scale drawing is executed on a paper, and then the lines are punched by pin leaving a trace of dotted small tiny holes on the paper. Then the paper is laid on the ground of where the muqarnas is intended to be built above. The master mason then used azure powder (in modern times) and charcoal powder (in the past) to leave traces of the powder on the ground. This pinned paper called gardeh (lit. powder), and were kept as template for other constructions. It has been reported that sometimes this punched papers were sent to other cities as master templates.
between a fully descriptive visualization of a future material construct and its underlying idea. This intermediary status elevates the girih drawing to a level that is granted with a capacity for mediation. The process of executing these drawings based on “invisible” dead drawings is also a process that requires imaginative participation.

Gazing Drawings, a Classification

The girih drawings of the Tashkent and Topkapi scrolls represent two-dimensional ornaments as well as three-dimensional spaces, which is evident in Necipoglu's classification of the Topkapi scroll drawings. Although Rempel and Necipoglu each studied and classified the Tashkent and Topkapi scrolls according the typology of ornaments in two dimensional and three-dimensional appurtenances, my classification here is a little different. This divergence is due to the study of the drawing’s association with architectural imagination and also with mystical teachings that dominated the time in which these drawing were executed, and not merely a study of existing typologies.

The Sufi’s mystical views, which requires the use of corporeal imagination is evident throughout their teachings. Ibn Arabi’s emphasis on the prerequisite of sight perception for an imaginal experience clearly asserts that notion. Referring to a curious hadith attributed to the Prophet (the formation will be established upon sacrum), Ibn Arabi interprets that hadith as concerning the imaginal body. According to Akkach, Ibn Arabi explains, “The sacrum represents the center whence

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59 Rempel’s classification of various types of drawings in Tashkent scrolls were mentioned above. Necipoglu also pursues similar approach and take classifies Topkapi scroll drawings close to that of Rempel.

60 I understand that my categories here could be arguable. However, my reason here is to distinguish the drawings in association with architectural conceiving in the design process; two-dimensional planes and three-dimensional spaces. Necipoglu’s classification also recognizes this distinction; however, she did not put plan drawings under the category of three-dimensional. A plan drawing, while seem simpler in construction based on a checker system functions the same as a muqarnas in the sense they both denote spatial depth which is not shown in the drawing. I am aware that one can find other alternatives to classify these drawings. There are, however, some of the drawings that have been eliminated in my classification, for example the last drawing of the Topkapi scroll with vegetal drawings (see Necipoglu, 1995, Cat. No. 114). The reason for that is due to the concentration on the abstract geometric mode on the one hand, and negligible quantity of such vegetal drawings in extant historical drawings.

61 Hadith is referred to word, and sermons of the Prophet Muhammad.
the body springs forth and upon which it is symmetrically established. It is the focal point of the growth, which occurs through three centrifugal movements: downwards, upwards and outwards. He also articulates the three movements to six Aristotelian cardinal directions based on the human body (up, down, front, back, right, and left). While these movements have immediate associations with the human body, they can imaginatively allude to three kinds of architectural visions/imagination in the drawing: downward, outward, and upward.

This triplicity of categories has been used to study three types of the geometric drawings, which correspond to such physical and figural views: downward-looking plan drawings, outward-looking two-dimensional drawings (i.e., elevation and section), and upward-looking three-dimensional drawings (i.e., reflective ceiling plan).

Fig.2.17. Conceptual drawing of the triplicity of planes of gaze, or geometric drawings. Drawing by the author.

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62 Akkach 2005: 89.
Although al-Ghazali mentions the tradition of drawing building plans, the earliest surviving plans date back to the 15th century and are associated with the eastern Islamic world. Consistent among these plans is a squared grid system on which the drawings were executed. Typically, checkered grids of 8-10 millimeters were constructed by a pointed device as deadlines (un-inked lines) on the surface of the paper.

These plan drawings do not show a sophisticated level of detail; rather, they communicate basic information, such as where the walls and columns are intended to be. The use of grid suggests a relationship between a grid unit on paper and a specific number of bricks. In an early Ottoman drawing, details of doors, lattice windows, and reflected ceiling are also shown, which was somewhat rare for that period and those that followed. In this drawing, “the paper was prepared with a blind grid of squares measuring 8 square millimeters on which the plan is drawn in black ink, with the thickness of walls colored red. Its representational conventions consist of domes drawn with a compass, crossed window lattices, and parallel semicircles indicating gate arch” (Fig. 2.18). Another related drawing does not show a dead grid; however, crossed deadlines in rooms and rectangular spaces could imply a system of creating proportioned spaces based on an initial grid line.

These Ottoman examples demonstrate the high-level use of technics and signs in executing those drawings, which resembles contemporary conventions in other eastern Islamic lands (e.g., Iran), where the tradition of drawing plans on a squared grid was commonly practiced. However, these drawings are much simpler compared to the examples above (Fig.2.19). The grid provides the traditional architect with a comprehensible modular tool for construction, which is also useful for cost estimation. Donald Wilber, for example, mentioned that during the Safavid period (1501 to 1722), cost estimations could be assessed based on the thickness and height of building walls. Each square unit of the grid would correspond to a certain

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64 This possibility has been indicated by Necipoğlu. See: Necipoğlu, 1986.
number of bricks. For an experienced master, this number represented an index of materials to be used in the construction, and most likely an estimate of time for the completion of the edifice. The relatively simple plan drawings compared to the detailed, large scale *girih* drawings can be better understood by the relative importance of a building’s final finishing details. One of the first recorded instances of the significance of ornamentation was by Ibn Khaldun in the 14th century. A late 19th and early 20th century architectural terminology popular among Iranian master masons could also affirm this idea. Asqar Sha’rbaf, a contemporary Iranian master mason, architect-engineer with family ties to traditional architecture of the 18th century, distinguishes building construction into two complementary parts: body or mass (*haykal*) and essence or ornate (*jowhar*). He considers *jowhar* as principal, which he argues is revealed in the three-dimensional geometric patterns of an edifice. Therefore, we can assume that architects of the past held a similar perception regarding the primacy of the final ornamentation over the building mass when they were conceiving architectural plans.

66 In this regard, Pournaderi mentions a visit to a mosque in Tehran with Asqar Sha’rbaf. When asked to interpret the inscription installed below brick muqarnas of the entrance of Imam Hossein mosque, Tehran, indicating: “Tell who is the designer and architect of this mosque? Master Muhammad [architect-engineer of the mosque]...”, that “who is Muhammad? That of in the building or in the ornamental patterns?”, Asqar Sha’rbaf mentioned: “the mosque itself is but a big mass (*haykal*), Muhammad is more that is in the geometric patterns (*kar bandi*),” His response indicated that master Muhammad’s fine work is found in the geometric patterns. See; Pournaderi, 2000: 48.
Fig.2.18  Partial plan of a royal mosque, 15th century, showing reflective ceilings and lattice windows on plan (Topkapi Palace Museum Archives E. 9495/8). Source: Necipoglu, G. 1986.

Fig.2.19  Eighteenth-century plan from Iran based on grid system. The plan represents a less level of sophistication compared to 15th and 16th centuries Ottoman plan drawings. (Victoria and Albert Museum Library). Source: Necipoglu, G. 1986, originally from P. Clarke, “The Tracing Board,” Pl. IV.
In reviewing extant plan drawings executed and used by Muslim architects, the simplicity of plan drawings is consistent. In fact, Ottoman drawings that represent more sophisticated plans are thought to be due to Ottoman architects possibly having contact with Western architects of the time, as evidenced in Necipoğlu’s observation: “The plan of an imperial mosque and later Ottoman examples from the 16th century … are characterized by a unique set of conventional signs, such as crossed window lattices, triangular latrines, circular water pipes, bulb-shaped furnaces, or parallel semicircles indicating door arches. Their use of some conventions typical of European plans, such as the drawing of arch elevations flat onto elements of a ground plan (characteristic of Western plans prior to 1500), the indication of domes with compass-drawn circles, of columns with circles inscribed in squares, or of steps with parallel lines, seems to imply contacts with European architectural practice.” 67 This linkage is supported by the fact that an invitation extended to the Italian architect Filarete is mentioned in historical sources, which supports the hypothesis that the sophistication of Ottoman plan drawings was influenced by Western architectural drawing traditions.

Plan drawings of the time captured the rough body (haykal) of the building with the details and ornaments to be added to the building through the construction process; they did not really feature an accurate representation of the final edifice. The edifice is completed with the addition of final ornamentations, which has been affirmed by various sources such as al-Maqdisi (10th century) and Ibn Khaldun (14th century), as well as by later documentation.

In the Arabic language, the term used for design is qaddara, which comes from the root term q.d.r., which is associated with measuring and numbers. Ikhwan al-Safa mentions an artisan who designed before commencing the work; that is, the work needed to have idea, form, and measured to be built. One of the implications of this concept is that the design alludes to some quantifiable attributes of the work. This is the same with plan drawings with no established scalar relationship between the drawing and the actual building. However, by relating each square unit to a certain number of bricks, a scalar accordance between the visual artifact and the building is achieved.

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established. In this sense, measurement and estimations for buildings in terms of
dimension and material were relatively clear at the stage of a grid-based plan.
Indeed, in this process an architect’s capacity to see forthcoming details undrawn
and invisible on the plan drawing was critical in successfully completing an edifice
with all its details.

The square form and squared grids—long representing the earthy realm—served as
regulating lines to conceive the foundation of the lower parts of a building. Such
drawing involved measuring the material realm. Representing a downward view,
plan drawings were eyes of the designers (muqaddir) looking below to the terrestrial
world, dealing with tangible realities such as measurements, material use, and laying
the foundations. The completed form of a building, during this phase, essentially
remained in the architect’s imagination.

Outward Looking Drawings: Two-dimensional Patterns of Elevations

Fig. 2.20. Topkapi Scroll drawing, Geometric drawing representing a two-dimensional
pattern. This type of pattern is used to ornate revetments with glazed bricks.

A simple group of two-dimensional geometric drawings is used to compose
calligraphic brick tiling, khat-i bannai (lit. masonry calligraphy). These are squared or
triangular grid-based drawings in which some of the squares or triangles are filled with different colors (Fig. 2.20). While Necipoglu’s broad definition of *girih* would include these geometric patterns as well, there is no consensus with regard to naming this category of constructs under the *girih* mode. These drawings communicate inscriptions and words (verbally) into the building ornamentation in linear, symmetrical, or rotation fashion. They maintain a direct relationship with the final built objects.

In the case of an equilateral triangular grid, they can suggest centralized forms but rarely imply three-dimensional space (Fig. 2.21). With no precedent for executing architectural drawings in such isometric projections, however, it remains unclear whether the intent of creating cubic-like ornaments was a three-dimensional interpretation of the detail or not. The inked grids correspond to colored glazed bricks, and the lines of the grids accord to the joints. In these drawings, the construction lines match the final drawing.

![Image of geometric drawing with inscriptions](image1)

**Fig. 2.21.** Left: Centralized form: Geometric drawing using triangular grid inscribing words Ali (center) and Muhammad (perimeter). Right: A Rare drawing aided by equilateral triangular grid. Some of the construction lines are eliminated, final form suggesting a cubic form. Such representation of the three-dimensional space is rare and cannot be regarded as a common practice. (Topkapi Museum Palace). Source: Necipoglu, G. 1995.

A second group of geometric drawings in this category is recognized by their composite radial construction grids (Fig. 2.22). Unanimously accepted as *girih* by all authors, in these drawings the construction lines and the final drawings do not correspond to each other formally, and are detected as two separate layers.
Executed through the use of compass and straight lines, the construction layer comprises circles with radii projected from the centers. The intersection of the radii with circles is used to create the final *girih* pattern. The geometric pattern is a result of connecting these intersections. In other words, the only literal overlap of the two layers of construction lines and drawing lines are some nodes. These nodes relate the invisible and visible layers of the drawing.

![Fig. 2.22. Topkapi Scroll drawing. Star-and-Polygon pattern representing a sophisticated *girih* mode. (Topkapi Palace Museum). Source: Necipoglu, G. 1995.](image)

Within a rectangular or square frame, at times corresponding to their repeat unit, the execution of these drawings suggests an order—a radial move from the corner of the repeat unit towards the interior. The final inked drawing, however, does not follow the order of the construction lines. Since the final pattern holds homogeneity, the pattern is potentially capable of expanding in all four planar directions. These patterns culminate in a star-and-polygon *girih* pattern category, which itself has a variety of sub-categories. The expanded final pattern implies larger orbit-like circles, similar to the string of a necklace, passing through a variety of shapes. With a variety of orbits, one’s eye is constantly roving from one orbit to another orbit, while imagining the “self” standing at the center. This experience moves the viewer away from a bodily visual experience and invites him or her to a realm of polycularity (Fig. 2.30), an imaginative experience linking the viewer to the potential cosmic attributes of the pattern (Fig. 2.23).
Fig. 2.23. The invisible construction lines of the *girih* pattern represent a different geometry from the final inked pattern. The circle structure can also be imagined/seen while one gazes at the pattern. In this sense, they function as imaginal orbits constantly moving the eyes from one center to another. That is how *girih* succeeds in taking the human beyond sight perception, which is based on the fixed position of the man in a certain place. Diagrams by the author.

Cultivated in an era of mystical thought, these star-and-polygon patterns carried cosmological attributes—and therefore were able to impart a transcendent sense of beauty. In other words, these well-proportioned drawings referencing polychromatic ornaments could be compared to music, in which harmonious celestial forms are revealed and cause pleasure. Accordingly, these geometric
patterns embody celestial orders to convey such beauty. The close affinity of the geometric mode of *girih* is comparable to that of heavenly music in Islamic culture.

Al-Dawwani defined audible and visual beauty as a congruence of parts producing a sense of unity: “The effect of cadences, concordant tones, metrical verses, and fine forms, is on account of the eminence of their unity in relation.” In the case of underlying orbit patterns of *girih*, rotating around certain center points unifies them according to that center. This sense of unity echoes the notion of Unity in Diversity, a conception highly elaborated in Islamic mysticism, which will be discussed later.

Influenced by the Neoplatonic musical tradition, as well as rooted in the Pythagorean emphasis on cosmology and numerology, music was considered capable of linking a human’s soul to the cosmic spheres. Although philosophers such as al-Farabi did not fully embrace the Pythagorean notion of the music of spheres, this notion “continued by a durable undercurrent. Initially explored by al-Kindi and perpetuated by the Brethren of Purity [Ikhwan al-Safa], cosmological affiliations would eventually crystallize in later centuries around particular musical modes.” For Ikhwan al-Safa, music was able to reveal the splendor of the cosmic world of the spheres and music creation “started with ideal forms abstracted by the creator’s imaginative faculty; these mental abstractions were translated by notes into sensible analogues.” Ikhwan al-Safa, giving reference to Pythagoras, “who heard the music of the spheres after having been cleansed of the defilement of corporeal appetites and raised to the sublime by constant reflection and by the sciences of arithmetic, geometry, and music,” discussed the purifying role of geometry. Geometry uplifted the mind and the soul to contemplate higher levels of understanding.

Similarly, Al-Farabi, who considered the formal elements of music as “analogous to the number in arithmetic, the limit in geometry (e.g., the arc of a circle, or the side of a square), the syllogism in logic, the strophe in poetry, and the foot in metrics,” emphasized harmonization (consonances) based on proportional combination of

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separate elements—a harmonization that originally was achieved through geometry. Therefore, while al-Farabi did not fully consider all the cosmological dimensions of music, he highly integrated music’s beauty to that of the geometric mode. It was in such an intellectual milieu that girih, with its cosmic orbits, linked to other modes of creative activity. In this regard Necipoglu observes: 72

… the proportionally interlocking colored geometric forms of girihs that could trigger an innate aesthetic reaction in viewers must have given medieval designers the hope of endowing their visual creations with the expressive potential and emotional immediacy of music. Polychromatic star-and-polygon patterns embodied notions of aesthetic purity and harmony visually aspiring to the music of the spheres. The invisible heavenly orbits of light governing the composition of these patterns can be interpreted as an ambition to raise abstract visual beauty to the same mathematical level as music. Through the use of the circle as a proportioning device, the notion of the music of the spheres found visual expression in girih patterns … . Just as the consonances of earthly music could strive to echo the heavenly music of the spheres whose transparent bodies I emanated light in circular rhythms, so did congruent girihs embody a nostalgic yearning for the pure crystalline structure of the heavens, infused with brilliant light. Their heavenly orientation, betrayed by the insistent use of stars, reflected a wider tendency in Islamic art and architecture to emulate celestial prototypes as models, such as the mansions and gardens of paradise or the Bayt al-Mansur (Prosperous house, the heavenly prototype of the Ka’ba in Mecca).

The geometric drawing of girih, therefore, is considered a contemplative practice as it purifies the mind and soul. It is also a pleasurable practice since it reveals celestial order and sources of beauty into the tangible world. Through the process of

72 Necipoglu, G.1995: 194. Necipoglu also indicates: “Widespread notions about the role of geometry as a bridge between the material and spiritual realms, coupled with the absolute beauty of its harmonious forms capable of purifying the mind like music, must have made geometric abstraction a particularly appealing visual idiom. The purity of a polychromatic abstract design vocabulary dominated by congruent geometric shapes approached the status of light and color, the only two properties that Ibn al-Haytham singled out as being beautiful in themselves in addition to proportionality. This purity of sterilized forms, absolved from impure defilement, no doubt augmented the positive resonances of geometric and geometrized patterns, often accompanied by Koranic inscriptions.” Ibid. 193-194.
constructing the beautifully proportioned patterns inherent in girih, one could connect to a higher realm. Such a possibility would have happened first through drawing, then thorough construction. This transcendental possibility made these drawings very precious and their contents secret. This “secrecy” can be found in the drawing process of Master Lorzadeh, one of the last of his generation with a link to the tradition of the 18th century master builders. In his book, Lorzadeh describes ways of drawing various girihs, starting from the rectangular frame (repeat unit) by drawing a circle and projecting radii lines. Then a “secret line,” khat-i ramz, is needed to cut the radii in order to find key intersecting nodes to create the ideal pattern (Fig.2.24).

![Fig.2.24. Example of drawing process of a girih by Lorzadeh. Left shows the process starting with two “secret lines” crossing projected radii (upper left quadrant). The drawing is also based on the concept of repeat unit, a quadrant of the complete pattern. Source: Lorzadeh, H. 2010.](image)

Most of these two-dimensional drawings were realized in vertical revetments. While the previous category (i.e., plan drawings) dealt with a “downward” view, this category refers to a “frontward,” or “face-to-face” view, an encounter that is directly experienced in the window. These drawings complement the invisible vertical surfaces in plan drawings. By following the grid mode of the plan, the vertical revetment patterns obey the geometry of the grid in standing upon earth (i.e., site).
In their own elaboration they depart from the rectangular frame and immediately create orbit-like underlying patterns that exceed the initial frame. These geometric patterns represent mazes of contemplation and wonder, lifting the “human eye” from downward-looking grid plans to the level of the “mind’s eye,” capable of transporting the viewer to a more purified level, and preparing him to turn his eyes upward to see the light.

Upward Looking Drawings: Three-Dimensional Patterns | Reflected Ceiling Plans

Fig.2.25. Example drawings from the Topkapi Scroll showing quarter of muqarnas for a vault structure. Star-and-polygon drawings represent three-dimensional space of (half) vault. (Topkapi Palace Museum) Source: Necipoglu, G. 1995.

Geometric drawings denoting the “reflected ceiling plan” are the most sophisticated and eloquent. These drawings represent a variety of spatial geometric constructions, culminating in muqarnas. Although conceived as three-dimensional embellishments, these stalactite structures were drawn in a planar mode. This made both the conceiving and construction process for these structures highly dependent on the talent and artistic taste (dhawq) of the architect. Al-Kashi’s treatise devoted a
section to measuring the muqarnas, introducing computation methods for assessing their surface area. However, as mentioned earlier, although his audience initially may not have been architects, such measurements do not seem helpful at all for actual design and construction.

This category of drawings, like earlier star-and-polygon drawings, assume a repeat unit—namely, half or a quarter of the entire structure. In the case of half vaults, the drawings are mirrored; in the case of full vaults, the drawing is mirrored along its two axes.

Necipoglu’s study of construction lines is revealing. Similar to the two-dimensional star-and-polygon patterns, construction of these drawings is “based on dividing concentric circles into equal arcs by equidistant radii, along which rows of polygons and star polygons inscribed in smaller subsidiary systems of circles are formed, the radial grid constitutes the basis of … three-dimensional geometric designs, including arch-net and muqarnas vault projections. It is often used in conjunction with other grid systems and axes of dynamic symmetry, resulting in composite networks of uninked ‘dead’ drawings that generate complex multi layered patterns.”73 Un-inked construction drawings provide a structure for the final pattern. In comparing the invisible construction lines with the final formal appearance of the geometric pattern, one sometimes finds a radically different order. Additionally, with a one-plan drawing a variety of spatial projections are expected, depending on the height of the vertical surfaces to be covered.74

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74 Necipoglu discusses the multiplicity of translating planar and spatial projections as such: “The direct translatability between planar and spatial geometry, based on a limited number of geometric progressions allowing a wide range of variation, contributed to the sense of unity in Timurid architecture and its surface decoration, reflecting an intimate relationship between the principles of architectural design and ornament.” Ibid. 13.
The muqarnas drawings were augmented by full-scale drawings in the construction site. The stalactite structure is composed of horizontal levels. The floor of the area above which the muqarnas was planned to be fabricated was used to pour plaster of Paris in layers about an inch thick. Then, the plan of the muqarnas was drawn on a thin sheet of the hardened mold. The transfer of the drawing from the full scale drawing on paper onto the plaster was handled through the use of pin-punched paper that allowed charcoal powder to pass through it. The powdery trace drawing was called hayula. The conventional use of the term is translated as “monster,” which could refer to the monstrous nature of this stage of drawing, in the sense it is composed of a variety of materials and processes, but was still not fully realized. In philosophical terms, hayula was “shapeless substance.” The term hayula is adopted from the Greek/Latin term hyle, and is particularly associated with the Aristotelian notion of matter, or cause of matter. This intermediary presence (a matter without form) also accords with the intermediary stage of translating the drawing into construction.

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75 Marco Frascari also discusses the monstrous nature of architectural drawing in detail. See: Frascari. M.1991.
Once the drawing (i.e. dotted lines of charcoal) was transferred onto the plaster of Paris, each layer and step were cut. Then by means of a plumb line, the plan was transferred to the space above to determine the accurate placement of each layer. Therefore, the process of constructing a muqarnas involved two drawing stages: the first on a small-size paper with no scalar relationship to the envisioned finished product, and the second in full scale on the floor directly below the “future structure.” The full-scale drawing was almost a re-drawing of an initial formal idea, since the “ideal” pattern on preserved scrolls did not necessarily match the proportionality of the construction job. In this sense, the transformation of the ideal pattern into an approximation of the larger scale involved the imaginative participation of the architect, an in-between level of the reason and sensory. The process of materialization also entailed another intermediary stage of the use of pin-punched paper, called gardih (lit. powder) paper. This betwixt material level is less material than the drawing on the plaster of Paris, but more material than the abstract ideal patterns preserved in the scrolls. The lines here are dotted punches (voids with no matter) allowing a shapeless substance (charcoal powder) passing through to cast tangible-materialized lines (dots, then read as lines) on the plaster. This function of the gardih paper is a reminder of Ibn-Arabi’s analogy of light and color glass, in which the existence of the light can be understood when the shapeless-colorless light passes through a framed stained glass, casting shape and color as it becomes more tangible. Additionally, the dotted line is an indication of a line that is there…but is not there, indicating an in-between state of “something invisible but present.”

The craft of approximating an ideal pattern to certain actual sizes and proportions belongs to the class of science known as hiyal. This act of approximation and fitting an ideal pattern to the confines of the reality is expressed by Muhammad Sha’rbaf when he refers to a drawing during a conversation with his son, Asghar Sha’rbaf: “You see this drawing, … but I see that corner … I see that how many times this…76 The latter often times undertook another stage as discussed above.  
77 Emmons, P. 2001. Emmons also discusses that dashed lines are not insignificant technical conventions but contain symbolic meanings, as indicated by Sebastiabo Selio linee occulte (dashed line) as “secret” and “hidden” portions of geometric solids.
drawing has changed dresses until it corresponds [properly] to that corner.\textsuperscript{78} By having some ideal patterns in mind (and perhaps in his own preserved scrolls), the old master was referring to the shrewd intelligence of the architect in carefully negotiating some ideal pattern within the actual restrictions of a corner of an existing wall.

The drawings of the space above, whether muqarnas or rasmi-band\textit{i} (kar-band\textit{i}),\textsuperscript{79} were the most imaginative of all in the sense that the third dimension was always in the designer’s imagination and was applied to the drawing during the construction process. The height would differ based on the real restrictions of the existing vaults or half-vaults, as well as according to the aesthetic judgment of the master builder. Based on a radial system, these drawings are constructed from a center projected outward; smaller circle and radii, in turn, similar to the original circle contribute in the construction of the invisible un-inked structure. Once drawn and completed, they invite the viewer towards the center. Constructed by a number of concentric orbits, and in a successive diameters and height elevations, the drawing implies a union of the center of the orbits in one vertical axis, orbits which previously held several centers in a two-dimensional fashion. While the construction of the invisible (un-inked) layer calls for an outward projection, the perception of the final visible (inked) layer invites the viewer inward to the center.

\textsuperscript{78} Pournaderi, 2000: 46, Trans. Hooman Koliji

\textsuperscript{79} \textit{rasmi bandi} or \textit{kar bandi} are Persian terms that are used interchangeably and refer to the geometric patterns that transform the cubic space of the lower chamber to the domical space above. In planar view they are confined within rectangular form of the chamber plan. Then through the use of triangular the rectangle is transformed to a circle. \textit{Rasmi band\textit{i}} or \textit{kar band\textit{i}} are the visible construction lines (rib structures) or merely decorative gypsum lines in the reflective ceiling of the vault. Therefore, the terms refer to structural or non-structural conditions.
Fig. 2.27. Left: Process of drawing a muqarnas by Lorzadeh. The drawings are based on the concept of repeat unit and demonstrate half of the vault. Each stage demonstrates one horizontal layer of muqarnas structure. Right: The completed muqarnas drawing. Source: Lorzadeh, H. 2010.

Fig. 2.28. Sha’baf’s drawing process to embed a circular kar-bandi in a pentagon at the base. Source: Sha’rbaf, A. 2006.

The center of the actual space, which at times is intended to be filled with light, is reflected on the paper as the starting point of the drawing; this is where one puts the center of the compass to initiate the drawing. As the designer conceives of
sophisticated stalactite forms or intricate interwoven *kar-bandī* drawings, the individual imagines the drawing to be lit, a conscious process leading the designer to make necessary changes in plan or in the invisible vertical surfaces. The space of the “reflected ceiling” becomes a space of proportion and light and color—the three elements that can reveal beauty, according to Ibn al-Haytham. The reflected ceiling drawing also suggests the paper to be serving as a mirror, reflecting a future above-head structure. This unveiling of beauty, giving rise to a sense of pleasure and wonderment, directs the mind of the viewer to a realm beyond the material world; one holding attributes of the imaginal.

The composite radial patterns are upward-looking drawings that transform the lower square structure to the upper circle. These astral drawings are symbolic embodiments of the celestial orders in the terrestrial world. With the intent of squaring the circle, the drawing starts from the rectangular frame. Ardalan and Bakhtiar explained the symbolism of the chamber and dome as following:

> The square, the most externalized form of creation, represents, as earth, the polar condition of quantity, whereas the circle, as heaven, represents quality; the integration of the two is through the triangle, which embodies both aspects. The square of earth is the base upon which the Intellect acts in order to reintegrate the earthly into the circle of heaven. Reversing the analogy, the square, as the symbol of the manifestation of the last of the created worlds, reverts to the first; thus the heavenly Jerusalem is seen as a square in its qualities of permanence and immutability, and the circle is seen as earthly Paradise. The end of the world is seen symbolically as the "squaring of the circle"—the time when heaven manifests itself as a square, and the cosmic rhythm, integrating itself into this square, ceases to move. 80

Therefore, the un-inked projected radii and construction circle drawings become a critical means for transforming the terrestrial to the celestial (i.e., reflected ceiling plan). In the execution of these geometric drawings, *girih* mode, the two layers of inked lines and dead lines distinguish themselves as two separate entities, although related. Based on the Islamic notion of the invisible word, which imparts its structure

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and order to the visible world, one could draw an analogy between that cosmology and the drawing’s ontology. These dead lines, which are not intended to be built or drawn, are essential in figuring out the overall interlocking web. The invisible layer of the un-inked lines is one that relies on drawing tools the most (e.g., compass, square, measuring tools) to mindfully conceive the structure, order, and final form of the interlocking patterns. The finishing inked lines, therefore, correspond to an invisible order. Using a similar analogy, we can cautiously say that the visible pattern is dependent on the invisible existence in the same manner that the visible world is dependent on the invisible Being.

In terms of the intellectual role that the invisible layer of the dead lines play, it is in this layer that the form, expansion of the form, measures, proportions, etc. are all conceived. As such, the invisible layer calls for the use of precision drawings tools, tools requiring knowledge of how to use them. The compass, analogous to the center of the world, becomes the center of the drawing. The final visible layer is analogous to the world of appearances. And if one looks carefully, it also belongs to the world of phenomena since the drawing relies on ink to give it a material reality.

The stage between the two is a thought-provoking level. It is the level wherein the drawing and the drawer move from an invisible structure to a visible world; certain lines should be inked, others left un-inked. Here the drawer sees or imagines the inked drawing as whole. It is a conscious stage in which the drawer’s alertness pertains to the both modes of the drawing: the invisible out there, and the visible not-yet there. This is perhaps closest to the imaginal experience; being in a state of its own reality and consciousness; seeing the unseen and bringing into material life a less material being.

The tradition of using dead lines was gradually supplanted by the contemporary use of blue lines and guidelines in contemporary architectural practice. There are still many similarities between them in terms of how the final drawing comes into existence and how the architect is engaged in an intermediary stage of giving birth to the final drawing. The constant move from the light blue/gray drawings and the emerging drawing is a move from two stages of being—one pertaining to a more intelligible one and the other to a more tangible world.
The invisible construction layer, the un-inked geometry, serves not only as an epistemological quest, but allows the drafter to depart the science of universal truths (i.e. geometry) for the science of the cosmos, imagining cosmic orbits and stars through the drawing. Together with the final inked drawing, the interwoven layers of invisible (un-inked construction lines) and visible (inked girih pattern) represent an in-between state of being, offering an ontological realm, and suggesting creative linkages between unseen ideas and seen things.
GIRIH: FROM AESTHETICS TO METAPHYSICS OF BEING

Al-khaliq, al-bari', al-musawwir: 81 it might be thought that these are synonymous names and that they all refer back to creation and innovation, but this is not so. Whatever is brought out from nonexistence to existence requires, first, design (taqdir), second, bringing into existence (ijad) in accordance with the design, and third, form giving (taswir) after being brought into existence. God, praised and exalted be he, is a creator (khaliq) in that he is a designer (muqaddir); a producer (bari') in that he is an inventor (mukhtari'), able to bring things into existence (mujid); and a form giver (musawwir) in that he arranges the forms of his inventions in the best (ahsan) order. This is like a building, which requires a designer (muqaddir) to determine what is needed in the way of timber, mud-bricks, area of land, the number of stories and their length and breadth. This is normally undertaken by an architect (muhandis), who forms and draws the building. Then a builder (banna') is needed to undertake the works whereby the building fundamentals occur. Then an adorner (muzayyin) is needed to chisel the surfaces and adorn its form. This is normally undertaken by a person other than the builder. This is the custom in designing, building and form giving.

-Al-Ghazali 82

Al-Ghazali’s mystical analogy between God’s creation and architecture is an insightful opening into a whole new realm of interpreting architectural practice, including that of the geometric mode and drawing. It is particularly insightful for a comprehensive understanding of the ontological status of girih. In his analogy, the Form Giving by God is compared to that of adorning a building. In this perspective, “ornamentation forms an integral part of buildings and not merely superficial decoration. Identifying the name Form Giver with both the order of the universe and the ornamentation of buildings implies that an unornamented building could have been perceived as unordered or unfinished. In this sense, ornamentation is something of taqdir, since form giving is only meant to bring out what has already been predetermined in the design.” 83 Such an understanding of the fundamental role of the geometric pattern in adorning a building corresponds to the creative mode of the girih—not as a passive planar visual, but as an active, ever-transformative agent linking the microcosm of the building to the macrocosm of the

83 Ibid. 52.
universe. The creative nature of the highly-ordered geometric patterns that complete a building situates the human-made edifice in a systematic manner to the larger creation. For a better understanding of how this concept functions, we need to further contemplate the ontological status of *girih* as a productive mode.

Expressing a variety of polygon and star shapes, the geometric drawing is driven by three main elements: point, line, and circumference. This trinity refers to the inherent order of the circle as an active agent behind the development of the *girih* mode, as seen in the un-inked construction layer of the geometric pattern drawings. The circle has long been regarded by Muslim scholars as an essential shape and a perfect, beautiful form with cosmological associations. This view has its roots in the Alexandrian school and Neoplatonic teachings. Significant for other traditions as well, the circle has geometrical importance, aesthetic, and cosmological attributes in the interpretations of Sufi mysticism. “The circle, which came to be regarded as the most beautiful of all geometric figures by the end of the Hellenistic era, is used in al-Buzjani’s treatise to generate all of the regular polygons in a plane as well as the sphere, the source of the five regular polyhedrons (Platonic solids) and two of the twelve semiregular polyhedrons (Archimedean solids) with which the work culminates.”

Buzjani’s treatise, *Kitab Ma’arifa al-Dawa’r min al-Falak* (Book on Knowledge of the Circle from the Heavens) shows his awareness of, and to some extent his interest in associating geometric forms with cosmology. Considering that most mathematicians of the medieval Islamic world (e.g., al-Buzani) were involved in some degree with astronomy, their views were transformed into the practical geometries they shared with artisans. That is how the “the predominant use of orbit-like radial grids in generating *girihs* may partly have been inspired by a mentality that assigned the most privileged place among geometric figures to the circle.”

In short, it was mysticism’s ontological perspectives that elevated and ultimately distinguished the status of the circle.

In Sufi mystic metaphysics, “numbers and geometry are indispensable tools that aid the reflection on the nature of divinity and illustrate the order of being.”

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84 Necipoglu, G.1995: 133.
85 Ibid. 133.
al-Hallaj (d. 922), a renowned Sufi who was executed in the Abbasid caliph for his mystical arguments against the mainstream orthodox theologians, we can begin to trace the importance of the agency of geometry as a sophisticated hermeneutical tool. Geometrical principles were associated with the creative process of world-making by God and coincided with states of manifestation and being. Ibn Arabi’s imaginative description of God’s manifestation in creating the world is informing. For him, the source of the creative mode is analogous to the Essence:

Every line projecting from the center to the circumference is equal to its companion and terminates at a point on the circumference. In itself the center neither multiplies nor increases despite the multitude of lines that project from it to the circumference. The point of the center relates to every point on the circumference by its same essence. For if it were to relate to one point on the circumference by other than that by which it relates to another, it would be divisible, and it would not be true that it is one, yet it is. So it relates to all the points, in spite of their multitude, by none other than its essence. It is certain then that multiplicity manifests from the one Essence without this Essence being multiplied.

The fundamental role of the center of the circle, which is analogous to that of the Divine Essence, granted the circle structure a transcendental dimension. The creative nature of the center, then, with multiple possibilities of relating itself in infinite directions to the circumference is analogous to that node of *girih* in the geometric mode. Ibn Arabi articulates this visual analogy and describes how the creative act is relevant to the creator and creation:

The line projecting from the central point to a single point on the circumference represents the predestination each creature has from its creator-most transcendent. It is his saying: “and our word unto a thing, when we intend it, is only that we say unto it: Be! and it is.” Will here is that line we assumed as projecting from the point of the circle to the circumference. It is the divine orientation (*al-tawajjuh al-ilahi*) that determines the existence of

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that point of the circumference. The circumference is the same "circle of potential beings" (da‘irat al-mumkinat), and the point in the center, which determines the points of the encompassing circle, is the necessary, self-sufficient Being (wajib al-wujud li-nafsihi). 89

Here Ibn Arabi considers a triplicity of elements involved in the creative act: Essence (center point), Will (radius, line), and Coming into Being (circumference, circle). This view of the circle's inherent order also accords with the Koranic concepts of creation. Nevertheless, his imaginative depiction of the creative act sheds lights into the nature of geometric representation and that of the drawing. With the line manifesting will and intent, and importance of the center point in relation to individual points on the circumference, he portrays the idea of geometric girih pattern with n-point nodal as manifestation of will for creation. This suggests a potential growing pattern that argues for unity among diversity of lines and points. An analogy between the architectural drawing and Ibn Arabi's view, could deliver insightful message: that the centerline, which is the cause of all creations, is the designer with his/her eye at the center of the drawing. Each line projected onto the paper is a will to make intents visible on the surface of the drawing. The drawn lines then become potential presences of buildings.

Referring to the verse, "He is the first and the last, and the outward and the inward" (57:3), Ibn 'Arabi says: "The world is between the center and the circumference: the center is the first, and the circumference is the last." In the above analogy, the entire drawing becomes a world of being and especially what is found between the lines—perfectly seen in the case of the geometric and architectural drawing in which so-called "architecture" is found between the lines. Ibn Arabi adds: "every point of the circumference is an end to a line, while the point out of which a line projects to the circumference is the beginning of that line, so he is the first and the last. He is the first of every possible being just as the point is the beginning of every line." 90 That is how the circle first symbolizes the creative act—it involves knowledge. In the Sufi tradition, the act of "knowing" is generally regarded as the "first affirmative attribute

that determines the Essence.\textsuperscript{91} The act of knowing itself implies a triplicity of elements: “knower, known, knowledge.” In our own analogy, a similar series of elements, “drawer, drawing, and (drawing) knowledge,” is inferred. The knowledge here is indeed one that is closely related to the imaginal capacity of the self that makes visible the invisible. Akkach also makes an analogy between these fundamental elements associated with knowing and God’s creation and the ternary structure of a circle when he wrote “The first qualification of the point: the unity of the center (knower), the multiplicity of the points of the circumference (known), and the connecting radii (knowledge).”\textsuperscript{92} The literature devoted to mysticism is characterized by various analogies—in particular between the creative act (involving knowledge) and the structure of the circle. However, the circle went beyond being merely the “most beautiful” geometric form to symbolizing the invisible or the unseen as a result of being laden with metaphysical interpretations. As such, the circle offers unique cues that help individuals not only gain a higher level of transcendental reality, but also helps to clarify the paradox of unity in diversity—a notion that has long been discussed by Islamic thinkers.

The geometric pattern of \textit{girih}, in which the circle structure is predominant, carries all these potential transcendental attributes. The circle and \textit{girih} can be seen at three different levels. The first level is the level of creation in which circle plays a structural and configurational role in creating construction layer for \textit{girih}. At the second level, one can see emerging orbit-like circles—either on the surface of two-dimensional patterns, or along one axis in three-dimensional patterns—in which the circle is perceived through a process of contemplation that involves imaginative participation. At the third level, the \textit{girih} appears in the final n-point star forms that emerge and create conclusive variegated patterns, all of which derived from the circle. These three levels correspond to invisible, imaginal, and visible states of the circle in \textit{girih} mode (Fig. 2.29).

\textsuperscript{91} Akkach, S. 2005: 68.
\textsuperscript{92} Akkach, S. 2005: 69.
Fig. 2.29. Superimposed interpretive diagram (over drawing # 39 of Topkapi Scroll) demonstrating three stages associated with the creation of *girih*: Circle (to start and give a structure), Emergence of Orbit-like circles, and n-point star forms. Diagram by the author. Drawing source: Necipoglu, G. 1995: 254.

The *girih* mode, then, embodies the circle at various levels. It holds symbolic attributes and serves as the basic creative element in practical geometry. When *girih* features a polygon design—in which polygons are embedded in and derived from the circle—it calls on the potentiality of multiplicity of forms within the circle structure. In Sufi mysticism, the Divine Being is the creative source of various forms of being, which is similar to the generation of different forms from the circle. Ibn Arabi indicates: “The world in its entirety is circular in form within which are then differentiated the forms of all figures, such as quadrature, triplicity, hexad, and so on indefinitely.” In this mystic view, a deeper intellectual structure governs the process of shaping these polygonal forms; they are hierarchical in order and state and manifest Divine names. Therefore, sensible geometric forms are preoccupied with intelligible concepts pertaining to the divinity.

That is how the geometric mode exceeds mathematical and rational propositions and alludes to the higher transcendental meaning of creation, as well as offers hints

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93 Ibn Arabi, (al-Futuhat), 1968: 3:420. This is quoted in Akkach, 2005: 73.
94 In Sufi view, based on Koranic verses, Divine names play a major role in the (Divine) creative process.
to the creative mode. *Girih*, by means of incorporating the symbolic circle at the intellectual, imaginal, and sensible levels, serves as a window to the invisible and the imaginal realm of the creative mode.

The essential connectivity of the sensible and the imaginal has been repeatedly mentioned by mystic authorities. Ibn Arabi considers the visual perception necessary for human imagination (psychological level) and for the imaginal (participating of human imagination into the mundus imaginalis). The human imagination, belonging to the internal senses, is often considered to be linked with common sense with the ability to judge, to assess. In the context of the arts and aesthetics Necipoglu indicates: “The internal senses of imagination (performing judgments of common sense), recognition, remembrance (memory), and inference worked together through the mediation of the external sense of sight in the subjective process of aesthetic judgment.” This view of the perceptive role of the faculty of imagination has been articulated by early rational thinkers and scientists. Ibn al-Haytham, for example, in his writings of aesthetics did not consider the sense of sight as necessarily possessing the capacity of aesthetic judgment:

Not everything perceived by the sense of sight is perceived by pure sensation; rather) many visible properties are perceived by judgment and inference in addition to sensing the visible object’s form, and not by pure sensation alone. Now sight does not possess the capacity to judge; rather it is the faculty of judgment that discriminates those properties. But the discrimination performed by the faculty of judgment cannot take place without the mediation of the sense of sight.

Capable of discriminating the properties of objects and performing judgment, the imagination goes beyond the function of modifying images and holds intellectual dimensions. In the case of geometric patterns, the symbolic dimension of the shapes—and the circle in particular—influences the faculty of judgment. Necipoglu indicates the possibility of a transcendental perception of the *girih* mode at its origin: “A notion of aesthetic purity aiming at a transcendental form of abstract

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beauty seems to be at work in the invention of the *girih* mode. Whose geometric shapes occupy an intermediate zone between intelligible and sensible forms.” The Brethren of Purity emphasized the purifying function of geometry and consider geometry capable of uplifting the mind to contemplate higher levels of understanding. They considered the ultimate aim of geometry as a gateway to spiritual wisdom by allowing the soul to “separate itself from this [corporeal] world in order to join, thanks to its celestial ascension, the world of the spirits and eternal life.” The Brethren of Purity’s view of the geometric mode calls for its intermediate role—not for its immediacy; the former is based on the contemplative role of the imaginative faculty, while the latter pertains to the sense of perception.

Ibn Sina defined geometry as a mental abstraction—but one that essentially remains bound to the material world. He also placed geometry in an intermediary position in the quest for metaphysical truth. For him geometry was comparable to a ladder by which one could ascend to astronomical knowledge and thereby move up to the metaphysical sciences. In an increasingly mystical medieval Islamic world, informed by teachings of Plato (e.g. divided line) and Proclus, such hierarchical ordering of geometry and knowledge is a commonly repeated theme, especially in mystic treatises such as what we just observed by Ibn Arabi on the circle, by which geometric knowledge served as a window to knowledge of higher divine creation. The hierarchy of knowledge can be appropriated to the ternary hierarchical world of being (intelligible world, imaginable world, sensible world). Therefore, three types of knowledge are commonly believed to exist. Ibn Rashiq, an Arab rhetorician of the 11th century, mentions these three levels of knowledge and also provides clarity to the essential role of geometry in shaping the intermediary level of knowledge in his treatise on poetics:

> Knowledge, in the philosophers’ opinion, is of three kinds: the highest, which is the knowledge of what escapes sensual perception and can only be attained through reason and analogy; the intermediate, which is the knowledge of the precious rules of decorum that reason derives from

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98 Ikhwan al-Safa 1928: 1: 42.
natural objects such as numbers, geometry, the art of astrology, and the art of melody; and the inferior, which is the knowledge of particular things and bodily objects.\textsuperscript{100}

Therefore, the intermediary knowledge between that belonging to the world of phenomena and that representing intelligible concepts is a type of knowledge dealing with geometry, melody, and astrology. The two former areas pertain to the senses of sight and hearing (the two most influential external senses), while the third area (astrology) imparts a cosmic dimension to intermediary knowledge. This level of knowledge also mediates between the inferior and superior as it is derived from natural objects on the one hand, and provides support for reason on the other hand. It is also a level of knowledge that deals with the soul. This intermediary knowledge is associated with the faculty of imagination, an aptitude of the internal senses to perform judgments based on sense perception. With Ibn Arabi’s insights in distinguishing between types of conceived things, “…a conceived things that has a form, … a conceived thing that has no form …” we can see that intermediary knowledge deals with the imaginable that possess form.

Indeed, a sense perception capable of contemplation, judgment, and penetrating to the realm of imaginative knowledge is different from a passive visual glimpse of some geometric pattern or a material artifact. Distinguishing between “pure sensation” and inferential “perception,” Ibn al-Haytham divided perception into “glancing perception,” and “contemplative perception.” The former refers to instantaneous recognition of repeatedly seen familiar forms collected in visual memory, while the latter pertains to a longer operation involving the inspection of all parts of an unfamiliar or complex object. The choice between contemplating or merely glancing is left to the viewer:

Sight perceives visible objects in two ways: by glancing and by contemplation. For as soon as sight takes notice of the object, it perceives its manifest features. Then it may or may not subsequently contemplate the object. If it contemplates and inspects all its parts, then it will ascertain its form. If it does not contemplate the object and scrutinize all its parts, then it

\textsuperscript{100} Translated in Cantarino, V. 1975: 147.
will perceive a non-ascertained form of it. . . . When, however, sight perceives an object and contemplates it, it perceives a verified form of it; and it perceives this form by contemplation.\textsuperscript{101}

He discusses the function of the contemplative vision in relation to minute designs and their proportional relationships, which can be fully apprehended only by contemplative vision:

When sight perceives an object whose beauty consists in the conjunction of properties and in their proportionality, and it contemplates the object thus distinguishing and perceiving the properties that produce beauty by being conjoined or by being proportionate to one another, and this perception occurs in the sentient, and the faculty of judgment compares those properties with one another, then that faculty will perceive the beauty of the object that consists in the conjunction of the harmoniously combined properties in it.\textsuperscript{102}

Ibn al-Haytham’s theory of optics and aesthetics, indeed, operates within a psychological framework. However, the notion of contemplative vision or scrutinizing gaze\textsuperscript{103} is something that has been repeated among mystic authorities. It is a “way of seeing” which permits the viewer to penetrate beyond the immediate appearance of an object and provides hints for the internal faculty of imagination to contemplate more deeply the visual artifact. Starting with sensual sight, the contemplative gaze opens up a window to go beyond the world of the materiality and penetrate to inner structures and intelligible assembly of the geometric drawing. This is also true in the case of miniature drawings, in which the immediacy of the visual representation is not the object of understanding, but the deeper layer of (re)presented realities belonging to the imaginal, which requires a contemplative gaze to unveil.\textsuperscript{104} Necipoglu’s poetic account of an individual’s involvement with the geometric designs of revetments through the contemplative gaze speaks to the departure of the viewer from the realm of appearances:

\textsuperscript{103} Scrutinizing Gaze or \textit{im'an-i-nazar}, has been used by some authorities and alludes to the contemplative quality of seeing. Necipoglu reports on the use of the term in ottoman texts as well.
\textsuperscript{104} Nasr, S. H.1987. Miniature drawings will be discussed later.
Elaborately patterned surfaces, covered by multilayered geometric designs interlaced with geometrized vegetal, calligraphic, and occasionally figural motifs, constituted magnetic fields designed to attract the gaze with their bewildering vertiginous effects. Their infinitely extendable, non-directional patterns of line and color, with no single focal point or hierarchical progression toward a decorative climax, required the insertion of subjectivity into the optical field; they presupposed a private way of looking. Such surfaces seduced the eye to alight on harmoniously combined colors and abstract patterns that could stir up the imagination, arouse the emotions, and create moods. Instantly recognizable pious aphorisms and familiar names, accompanied by longer quotations from the Koran, the hadith, or poetry that addressed literate audiences, further enriched the intellectual potential of visual perception. Visually complicated architectural revetments, open to a wealth of resonances and a multiplicity of meanings, interacted in different ways with the subjectivity of viewers. They created artificial environments of fantasy and contemplative introspection, simultaneously reflecting the glory of the builder, the decorator, the patron, and of God, in addition to advertising their own sheer visual richness. Written sources comment not only on the internalized mental processes of visual perception but also on the ingenious skill of architects and decorators who ennable raw matter through ideal mental forms abstracted by the power of the internal senses.¹⁰⁵

While there are strong indications of “pious aphorism,” Koranic verses, hadith quotations, and poetry in Necipoglu’s depiction of the imaginative capacity of the gaze, the author, nevertheless, prefers to stay in the domain of a psychoanalytic approach in regards to the role of the imagination. Despite her indication of the bewildering vertiginous effects of the girih mode, which is that of taking the viewer to the level of apprehending appearances up toward contemplating ideas, Necipoglu does not admit the anagogical role associated with the experience of the geometric pattern. Nevertheless, one could obviously see strong cosmological references in those geometrical representations that permeate Necipoglu’s words.

¹⁰⁵ Necipoglu, 1995: 204.
Considering her appreciation of a historico-cultural approach to interpreting a visual representation, one sees the influence of systematic study in her writings—although she never rejects the possibility of a mystical interpretation.\textsuperscript{106}

The geometric drawing expresses an immediate presence through its materiality; but it also represents a puzzle to be deciphered via the concurrent participation of imagination and intellect. The materiality of \textit{girih}, itself, alludes to the Sufi perspective delineated by Ibn Arabi as “One/Many.” One geometric pattern can find many material incarnations in brickwork, glazed interlocking ceramic work, solid woodwork, lattice windows, etc. Therefore, while it represents a single idea, the embodiment of the idea varies. Considering all the techniques involved in each other these materializations, \textit{ilm al-hiyal} becomes the magical know-how, the ingenious transformative knowledge of making. In the same context, one can see the birth of the geometric \textit{girih} is Koranic illuminations on paper, and its literal presence on architectural revetments of various modes. \textit{Girih} itself manifests One/Many.

In placing \textit{girih} in a historical context, one finds a continuous tradition of intellectual practice since its inception. It was derived by mathematical and rational premises in its early centuries of life, then expanded into spiritual and mystical dimensions, after which it reached a period of solidification just prior to the modern era. These three periods in the life of \textit{girih} (i.e., intellectual, imaginal, and material) represents a triplicity that shaped and governed Islamic thought.

During the second period (roughly the 14\textsuperscript{th} to the 17\textsuperscript{th} centuries)—which is discussed in Part Two—architecture and other forms of art (\textit{san'at}) relied on mystical interpretations to fully appreciate their depth. As traditional society became more Sufi-oriented, mystical thought and acts disseminated and existed in all aspects of human life—and particularly in the geometric drawings of \textit{girih}. This mystical view of the geometric drawings of \textit{girih} (and other modes of art, \textit{san'at}) was reinforced when they were embraced by the court’s scriptoria in an era dominated by literary

\textsuperscript{106} In studying Necipoglu’s research, which is associated with a, historico-cultural approach, one finds numerous references to a mythico-spiritual view. This, indeed, demonstrates that these two approaches overlap and should be viewed through a hermeneutical approach.
criticism, rhetoric, and poetry. Geometry served as a tool to connect with the visible world the invisible.

Girih, initially an intellectual exercise of the rational mind grew beyond its early Greek metaphysical status and associated with Sufi cosmological interpretations, becoming a meditative vehicle for contemplating divine creation as understood in the Islamic view. Resembling a cosmic order in structure, the geometric pattern of girih, becomes a microcosm. It is by means of this creative mode that the skilled architect is able to transform geometric principles into the material order—say, in erecting a dome. As the world of ideality is transformed into the realm of materiality by means of the ingenious know-how of ilm al-hiyal, the pattern object calls for a scrutinizing gaze, im’an-i-nazar, to travel up, and penetrate into the ideality that gives structure to the object. This concept represents an intermediary between the intelligible at one end, and the sensible on the other—but requiring the realm of imagination to interpret and appreciate.

The intermediary knowledge of imagination, then, holds transformative power in either direction by transmuting ideal concepts into material means and vice versa. It is this transformative state that makes the role of the girih drawing unique, enabling the person to move from the in-between to the mechanics of the materiality or to the essentials of the spiritual realm. This in-between-ness of the drawing occurs in a variety of modes and levels. At the level of the execution, the drawing is a result of close negotiation between the intellectual level of the geometrical construction layer (i.e., invisible geometry) and the final inked materiality of the drawing. Between the two, the imaginative participation of the one who draws leads the individual through the intersecting lines, connecting them with ink, thereby deriving the visible layer from the invisible structure. It is at this level that the individual exceeds monocular sight and occupies the entire drawing by imagining himself at the center of each n-point nodal girih. This is in effect a polyocular vision allowing the individual to inhabit a multiplicity of centers across the drawing at the same time, giving one an experience of holding multiple bodies, being one and many at the same time. This is essentially an imaginal experience. (Fig. 2.30).
Fig. 2.30. Superimposed interpretive diagram (over drawing no. 35 of Topkapi Scroll) demonstrating the process of creation of *girih*. Once the construction lines (comprised of circles and radii) is conceived, the imaginative eye of the draftsman inhabits the drawing and makes connections between nodes of intersection and future visible lines of the *girih* pattern. Diagram by the author. Drawing source: Necipoglu, G. 1995: 252.

While the geometric drawings of *girih* represent a mathematical concept possessing universal validity in the realm of geometric thinking, it can appear in a variety of material incarnations. The same drawing can be used for the woodwork *girih* pattern or for a jigsaw puzzle of glazed titling. Such rich multiplicity of readings from a single drawing made the drawing a multilayered narrative to be used across time and by many master builders—which is a reason why scroll drawings were kept as secret treasures through generations of masters. One can only conjecture as to why these drawings were not handed down to subsequent generations of architects and master masons. Was it due to a feeling of spiritual piety or plain jealousy? Either way, it represents a polarity of celestial and terrestrial attributes that also comprised the architecture.
Some of the sophisticated two-dimensional drawings represent three-dimensional space under a vault or dome. The transition from planar representations to actual spatial realization was first made through a mental imaginative projection of the pattern into the three-dimensional mode. This process of projecting lines of the plan into space was later replaced by real line ropes (i.e. the plumb line), making the process of constructing vaults and muqarnas highly dependent on the imaginative capacity of the builder. In this view, the drawing remained close enough to the realm of reality to originate a construction, and distant enough so that it required the active agent of the imagination of the builder to conclude intricate spatial forms.

The abstractness of the \textit{girih} drawing, very close to those found in the treatises of theoretical geometry on the one hand, and to the multiplicity of potential presences in the real world (in various planar revetments, spatial revetments, multiple materials, and colors) on the other hand, was due to the fact that the drawing represented an imaginal pattern. This pattern, reflecting a cosmological view of society, was highly charged with mysticism, while simultaneously relying on worldly proportions, colors, and representation. Making it an imaginal configuration residing between the ideal geometry and material revetment was a subtle experience that required constantly travelling between the two, while still possessing its own world.

As Corbin reminds us, the intermediary (i.e., the drawing) becomes a “symbol with” the worlds it mediates.\footnote{Corbin, H. 1998: 217.} That is how the \textit{girih} drawing, which mediates between the higher invisible level and the lower sensible level of material phenomena, became a symbolic representation. Committed to both these worlds, the \textit{girih} drawing, similar to miniatures that are based on the heterogeneous division of the two-dimensional surface and the three-dimensional world, came “to symbolize a state of being as well as a degree of consciousness.”\footnote{Nasr, S. H. 1987: 178.} In its symbolic role, the drawing transcends the psychological level that causes aesthetic perception and connects the person into the cosmological dimensions of the existence, serving a microcosm for the macrocosm. As such, the \textit{girih} becomes a mimetic act of world-making on a smaller scale, and is based on divine creation. This symbolic function of the \textit{girih} drawing prevents it from being understood by sight alone. Rather, it needs a contemplative
gaze to unveil its creative truth—that is, relating one to the pure beauty of the Creator, manifesting the pure beauty and love. This is when the heart is moved.

To summarize, belonging to the imaginal world, girih calls for its own plane of existence, distinguishable from that of ideality and materiality. In its execution girih drawing represents a move from the world of abstract ideas to concrete things, requiring the ingenious faculty of imagination to transmute truths into the particularities of the material world. Once executed, the girih drawing can serve as a symbol and becomes an anagoge, taking one to higher realities hidden beyond the veil of materiality. This ascend is a flight of imagination starting from the human imagination to mundus imaginalis.

Girih, in effect, is a simultaneous interface and opening between the upper realm of ideas and lower world of construction, constantly separating and connecting the worlds it mediates. The girih drawing itself is a subtle being, in the sense it possesses thin materiality of ink and paper mediating between pure geometry and the construction. Viewed as a geometric mode, the girih drawing is an imaginal being; it possesses form, size, proportion, ... while not fully lending itself to the world of phenomena. The girih, embodying the notions of “commitment,” “marriage,” “bond,” and “tying,” connects the world of invisible and visible, through its in-between existence. It is this marriage characteristic of girih that allows the physical artifact to be related to intelligible concepts and vice versa through its subtlety.

Featuring a particular geometric mode, each girih accords to “one” single mode of existence; hence, the potential to be incarnated into a variety of materials, each girih corresponds to “many” appearances, making it a world of potentialities. Girih, therefore, as a subtle entity is not restricted to one mode of material manifestation. In Ibn Arabi’s terms the girih is one and many concurrently. Additionally, each girih itself is a representation of a higher reality and a representation of a future structure, or it is neither of them. That is how the girih becomes a resident of mundus imaginalis, mediating the two worlds of ideality and reality. Girih drawing becomes the space of isthmus, barzakh, where ideas and raw matters negotiate their destinies.
To further understand the notion of *girih*, one should study it beyond the drawing convention and in a constructed form. This calls for a richer understanding of *girih* as an in-between concept, between geometric mode and material phenomenon. Part Three will examine the *girih* in one of its material forms: a *girih* window.
3: BETWEEN INSIDE AND OUTSIDE

The historical architectural drawing of the Islamic province involved the notion of imagination since its emergence, and later associated itself with the imaginal. In the context of visual culture, imaginal involvement was undertaken by the use of the geometric pattern of girih, and to some extent, by semi-abstract miniature drawings. In further studying girih as a subtle body (imaginal) in architecture, Part Three of the dissertation aims to examine girih in one of its modes of material manifestation, a girih window, namely Orosi. Some of the qualities and characteristics of girih, which were discussed in the previous Part, are employed here to study the in-between condition of the orosi window. Examples of architectural drawings (from historical sources and by myself) pertaining to the three realms of the Sensible, Intelligible, and Imaginable to which both drawing and window are related will be used to demonstrate the imaginal dimension of this girih window. This also examines the imaginal nature of the girih mode in wood and drawing as a subtle material existence mediating between the intelligible and materials worlds. The imaginal drawing, as seen in the case of girih, embodies a thin mode of existence residing between ideality (conceptual forms) and reality (the materiality of the drawing its manifestation in other material forms). In the end some reflections will be given on drawing as a vehicle to penetrate the imaginal; to demonstrate the mundus imaginalis within the window.
Part Three discusses the imaginal in relation to the *girih* drawing and architectural space. It includes a review of Parts One and Two in their historico-cultural context, but concentrates on the notion of in-between and the imaginal through a study of a *girih* window, namely *Orosi*.¹ This window is comprised of a wooden structural frame with vertical sliding openings mediating between the interior space and the garden or courtyard. The aperture is ornamented by geometric interlocking patterns, manifesting *girih* in material existence (Fig. 3.1).

![Fig. 3.1. Example of *orosi* window from outside and inside views. *Sheikh al-Islam* House, Yazd, Iran, 19th Century. Source: Monograph on *orosi* Window, Ansari, A. and Nobari, H. 1985. Shahid Beheshti University, Tehran, Iran.](image)

This *girih* window well exemplifies the attributes of in-between and imaginal being. Because it mediates between two fundamental spatial conditions—inside and

¹ *Orosi* window, widely used in the 18th and 19th centuries of Iran, is comprised of *girih* woodwork, sometimes featuring vegetal woodwork patterns. Noteworthy is that in the 18th century the *girih* mode lost its dominance in architectural revetments and its use was restricted to certain architectural elements. Vegetal patterns became popular in the third period of *girih* evolution (17th century onward). Therefore, *Orosi* associates itself with multiple chronological periods of *girih* mode. An alternative pronunciation of the term is Orsi.
outside—it represents a physical expression of the in-between. One is defined by
the enclosure of the building and the other corresponds to the outdoor
environment of the garden. With its delicate craft, miniature-scale wood muntin and
colored glass in a sophisticated interwoven web of geometrical patterns, orosi is a
material embodiment of the girih mode, inviting the viewer to participate in a feast
of variegated lit shapes and shadows inside the room.¹

The aesthetics of orosi (colored glass with the proportioned girih) mirrors Ibn al-
Haytham’s theory on light, color, and proportion as three independent elements
caus‐ ing beauty. This window embodies all the three elements capable of creating
beauty, and independent from the subject-object relationship. In this case, the view
can be either the window itself or what is seen through it, as if orosi was becoming a
transmuting agent that beautifies what is “seen through.”² Conceptually, orosi can
also be associated with Ibn Arabi’s contemplations on light and color;³ in the sense
that it becomes a medium to make pure invisible light visible to the human eye. This
window, thus, seems to be holding various attributes of the imaginal, the in-
between realm that is explored in the context of the present study. Lending itself to
the philosophical discussions on the notions of beauty and the imaginal, orosi also
mediates between spatial conditions of inside and outside. The worlds of inside and
outside bear anagogical interpretations; the earlier represents the subjective realm
of intellection, while the latter alludes to the objective realm of physical phenomena.
In this sense, the notion of window exceeds its literal meaning and can lend itself to
interpretations in literature and critical literary. Orosi, here, becomes an al-mithal,
through which we can study the imaginal nature of girih, as well as the window itself.

This window will be studied in terms of its material construct, intellectual concept,
and its imaginal existence. The discussions are interpretive readings on the in-

¹ While other materials such as glazed tile, or brickwork also manifest girih, it is the wooden pattern of
the window that makes girih accessible from the two sides of its plane (i.e., inside and outside). Other
modes of girih such as wall or vault ornaments are accessible to the viewer only from one side, and do
not project into spaces through light, shadow, and reflection.
² For a discussion of Ibn al-Haytham’s aesthetics theory and Ibn Arabi’s discussion of light and color, see
Part Two of this dissertation.
³ Dealing with light and color, this window manifests a material example for the Islamic theosophical
argument of the invisibility of the God (pure light) and its signs (color) in the world. This analogy was
used by Ibn Arabi.
between nature of the *girih* mode, and to a larger extent, on the architectural
drawing. The discussion not only aims to provide a deeper understanding on the
imaginal attributes of the *girih* mode, but to impart on the architectural drawing in
our contemporary context as it relates to the imaginal. While last in the order of the
dissertation, Part Three features an ongoing exercise of my own drawing integrated
to the study, sponsoring further reflections and contemplation on the notion of
architectural drawing (particularly the geometric *girih* mode) and imaginative
knowledge as they pertain to the Islamic context. The nature of the study also
involves the act of (experimental) drawing, as a means to examine it as a
contemplative tool that can generate imaginative understanding of the subject of
the study (i.e., *girih* window). Thus, this section is accompanied with speculative
reflections as an attempt to obtain understandings made possible through the
drawing.

**Material Construct**

*Orosi* is a style of wooden *girih* window that was widely popular in 19th century Iran.
There has been speculation among historians in the field on the exact place of origin
of this window, but no definite answer has yet been found. The royal palaces of
Safavids (1501-1722) used early modes of *orosi* in their construction. Due to the
popular use of *girih* windows in Islamic lands, it is worthwhile to quickly review the
use of wooden *girih* structures in the Islamic world.

Early signs of carved *girih* as individual star patterns and semi-curvilinear forms (as
opposed to interlocking patterns) can be found as early as the 9th century in the
Great Mosque of Kairouan in Tunisia (Fig. 3.2). As for the emergence of *girih* mode in
woodwork, Baghdad of the 10th and 11th centuries can be considered to be the place
where early *girih* windows most likely emerged. The use of Mashrabiya windows or
carved lattice woodwork was popular in Baghdad of the 12th century.
Fig. 3.2. Left: Kairoun Mosque Minbar (c. 862), Right: Details of the geometric and vegetal patterns of the minbar. Geometric patterns of the minbar suggest early emergence of knot-like patterns. Source: Ettinghausen, R. and Grabar, O. 1987.

Documents as early as the 13th century suggest that interlocking patterns were broadly used in artifacts of the Islamic lands. Al-Jazari, Islamic polymath from al-Jazira (upper Mesopotamia) in his treatise Kitab fi Ma’arif al-Hiyal al-Handasiya (Book on the Knowledge of Ingenious Devices, c.1206), discusses metalwork and tongue-and-groove techniques to create geometric patterns in doors and windows. Considering that the making of interlocking patterns out of metals was more challenging than using wood, we can reasonably conclude that girih woodwork must have been quite a fairly common practice as early as the 13th century (or even earlier). Significant to this discussion is al-Jazari’s notes on the drawing tools. There, he discusses an angle-bracket ruler (guniya-i mistara), a tool for measuring and drawing predetermined angles. Drawing tools, such as squares, were mentioned by al-Buzjani in the 10th century. Additionally, a drawing of a set square is documented in Fi Tadakhul al-Ashkal al-Mutashabiha aw al-Mutawafiqa (On Interlocking Similar or Congruent Figures) as a guide as how to employ drawing tools in executing girih, thus suggesting the popularity of the drawing tools of the time (see Part Two: Fig. 2.4). However, the use of a relatively sophisticated angle-bracket ruler in the 13th century reveals a high presence of the practical geometry particular to craftsmen. This tool enabled them to use pre-determined angles to execute drawings in
carpentry and in the construction of the geometric patterns of windows, thereby conceiving well-proportioned shapes and patterns in their efforts to convey divinity.

Based on Al-Jazari’s treatise explaining metal casting girih patterns (a very complex technique), the use of wooden girih can be traced back to earlier than the 13th century. It is likely that early interlocking girih windows emerged between the 12th and 13th centuries. Building on Necipoglu’s theory that the first signs of girih emerged in the frontispieces of the holy script Koran (i.e., divine association), I am tempted to assume that early signs of wooden girih emerged in minbar (pulpit for reading the scripture) structures, a space with sacred attributes. Based on this assumption, one can see the development of girih from thin paper material to a two-dimensional wood ornament in minbar, and then in the window. Nevertheless, geometry continued to inform carpenters both as an instrumental tool and meditative vehicle.

Arab historiographer of 14th century, Ibn Khaldun, asserted that geometry was essential to carpentry. He refers to knowledge of proportion and measurement as specialized areas that a carpenter would know:

In view of its origin, carpentry needs a good deal of geometry of all kinds. It requires either a general or a specialized knowledge of proportion and measurement, in order to bring the forms [of things] from potentiality into actuality in the proper manner, and for the knowledge of proportions one must have recourse to, the geometrician. Therefore, the leading Greek geometricians were all master carpenters. Euclid, the author of the Book of the Principles, on geometry, was a carpenter and was known as such.\(^5\)

Knowledge of proportion, a reminder of Ibn al-Haytham’s elements that give rise to beauty, was considered to be a specialized knowledge that was best used in making girih patterns in doors and windows. The theories of light, color, and proportion elevated practical geometry to a meditative field that would purify the soul and mind by demonstrating exemplars (al-mithal) pertaining to the structure of divinity.

This perspective was widely embraced by the Islamic world as a result of popular mystic beliefs throughout the 13th century and later.

It is under such conditions that conceiving the *girih* window was significant since it represented an embodiment of all of the above-mentioned elements of the beauty, platform for mediation, and an exemplar (*al-mithal*) of the invisible. The window also offered a strong metaphor to connect the inner self in this world to the invisible other world—essentially, to open one’s soul to the beauty of the divine.

Popular *girih* windows in the Persian plateau evolved into the *Orosi* window.\(^6\) Miniature paintings from 1410 illustrate the use of *girih* windows in Iran (Fig. 2.3); however, early signs of *orosi* are not found until the 16th and 17th centuries. During the Safavid dynasty (1501-1722), *orosi* was in use in certain royal buildings.\(^7\) Numerous reports of *orosi* window verify its popularity in Isfahan of Safavids (1580s onwards). Among those are such oriental travelers as Adam Olearius (1599-1671), Engelbert Kaempfer (1651–1716), German naturalist who visited then Persia in 1683, and James Baillie Fraser (1783–1856), Scottish traveler and author, who reported on the existence of this type of window. Olearius observed “[Persian] windows are commonly as big as their doors, and in regard their buildings are not very high; the frames ordinarily reach up to the roof.”\(^8\) By the 18th and 19th centuries, the widespread use of *Orosi* windows is recorded in Iran in a variety of building typologies: palaces, mansions, garden pavilions, and more.\(^9\) French architect Xavier Pascal Coste’s (1787-1879) drawings of Persian architecture capture many uses of *orosi* window in a variety of buildings including ordinary residences (Fig. 3.3). Due to

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\(^6\) Windows with wooden latticework, however, seem to have been long used in a broader region. A standing tradition up to modern day is lattice window that has largely been in use in most Islamic lands. In Egypt, Syria and other Arab lands, use of *Mashrabiya*, a projected bay-like window to the exterior of the building, was prevalent. These types of oriel windows have been traced to the 12th century in Baghdad of Abbasid period. Commonly used, in east of the plateau of Persia, was *Jali* windows, with screens carved out of stone or wood. Evidence of these screens can also be traced to the 16th century in the construction of Taj Mahal. These two traditions of making and using screened windows both well-practiced in 16th century at two sides of ancient Persia. Considering that Persia geographically and culturally was central to these two design traditions, it is tempting to conclude that *Orosi* window could be a result of the negotiation of the two traditions.

\(^7\) Amraee 2009

\(^8\) See: http://depts.washington.edu/silkroad/texts/olearius/travels.html#isfahan

\(^9\) Pirnaya 2008. There does not exist a research documenting these windows in a historical manner. Therefore, there is no accurate information about the oldest existing window of this type. From historical surveys of late 18th, 19th, and early 20th century buildings, one can find extensive presence of this window in those dates.
the fragile nature of their components (thin wood and glass), few windows older than two hundred years survive to this day.

Fig. 3.3. Pascal Coste, *Orosi* window in an ordinary mansion. C. 1841. The perspective drawing demonstrates two men sitting by the opening of *orosi* with parts of their hands being outside. Source: Pascal Coste drawings.
Etymological studies disagree on the exact origins of orosi. Pirniya, an Iranian architectural historian and scholar, contemplated the root term of term Orosi. Considering that in the Persian language the prefix “or” denotes “above or high,” Pirniya suspected that the vertical sliding nature of the aperture might have given rise to this name. He also speculated that the term orosi or oros might have associations with the term aroos (lit. bride), as an explanation for the soft or “feminine” nature of the window. However, Pirniya does specify any place of origin for this window.

Several signs, however, suggest that the Tabriz (a city in the northwest part of Iran) could be the birthplace for this window. Tabriz served as the capital of the Safavids for the first half of the 16th century (1501-1555). Additionally, if Pirniya’s speculation on the origin of the word orosi holds any truth (as being associated with the Aras river or its Russian origin, roos), then city of Tabriz as the largest city close to Aras river and rich in the arts and crafts would seem a natural place to give birth to orosi. Starting as Persia’s largest bazaar and then evolving to an important commercial and technological center, Tabriz attracted fine craftsmen and artisans who were in constant contact with Ottomans and the northern provinces. Additionally, the natural landscape of Tabriz meant that one of the few trees in the Persian plateau—the plane tree—could supply the wood for this craft. One last thing that makes this theory appealing is that currently western Iran is known for the best types of surviving orosi and the crafting tradition, especially since the orosi window and Topkapi scroll drawings emerge from the same region during the same era.

Between Inside and Outside

Residing between the inside and outside, the orosi window is a thin plane mediating between the spatial depths of its adjacent environments. Uniform in geometry, the two sides of this window, however, establish very different interactions with the

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10 Pirniya also speculated might have association with Aras (a river in north of Iran bordering Iran and former Russia). He also speculated that the term o + rosi might had some associations with roos (Russia). Then he suspected that this type of window might have some associations with Russia; however, no widespread use of this window has been reported in now Armenia, Azerbaijan, or Turkmenistan. See Pirniya, K. 2008.
material world. From the outside, it displays an intricate wooden interlocking geometric pattern with a degree of homogeneity, in the sense that the colored glass pieces are visually inert in the daylight. The inside view, however, is filled with numerous illuminated shapes, distinguishing themselves by their color and shape. From the inside, with wood bars turn into dark datum lines and variegated rays of light project the geometric framed shapes wash the space. At night, with the artificial interior light, these relations can be reversed. The inside and outside represent distinct worlds, spatially, imaginatively, and conceptually.

The Inside

Inside the orosi window is a major room. This space is an enclosed chamber, both in the traditional house and in the case of a garden pavilion. The room is often rectangular in plan with the window in its wide side. Examples can be found, though, of non-quadratic rooms that include heptagonal plans that are embedded within rectangular. The room varies in size, proportion and shape; however, common in all of them, is the location of orosi, facing sunlight and the outdoor landscape of the garden (Fig. 3.4).
Fig. 3.5. Various typologies of the room floor plans with *Orosi* window. Entering the room often happens parallel to the surface of the window. Source: Monograph on *orosi* Window, Ansari, A. and Nobari, H., 1985. Shahid Beheshti University, Tehran, Iran.

Often times, the entrance to this room is from the side, creating an axis parallel to the plane of the window. Therefore, upon entrance, the window is either at one’s left or right side (Fig. 3.5). The ceiling is flat or vaulted, elaborated with ornamental patterns. Nevertheless, the most vivid ornamentation belongs to the window itself. Unlike conventional windows of the region with rather small openings in the wall, the large size of *orosi* window makes it almost one of four vertical surfaces that
define the room’s enclosure. The room is constructed based on domestic units of measurements, often standardized by local bricks.¹²

This room was typically the most spacious and celebrated indoor space in the traditional house, sitting on the main axis of the hayat or courtyard, facing the sunlight. The room is conceived based on geometric principles and alludes to intelligible concepts, while the courtyard engages the individual to the sensible realm. Due to its significant location in relation to the courtyard (not to mention its size and design), this room is also called Shah Nishin (lit. king’s seat), a superior place in the house for seating. Shah Nishin is located in the north side of the courtyard, facing the sun, and a few steps higher than the courtyard level. The name of the room is also revealing. Shah (king) is a word that is also used as an adjective, denoting high or prime status for things. Nishin meaning seating, placing and settling, thus denoting one’s settling down and inhabiting a place. The room with the orosi window is, then, the prime room to settle down and inhabit the building.

The embodied experience (to inhabit) the room in a seated position is also suggestive; it submits that the act of inhabiting the place occurs in rest and seated,--a body posture permitting contemplation of the space and the vertical surface of the orosi from the interior of the chamber while remaining still and reflective.

In most post-15th century urban plans of Iran, major building courtyards were oriented towards Mecca, with the Shah Nishin facing to same direction. As a result, in traditional building it was common to find orosi facing towards the sacred direction (while still receiving a significant amount of sunlight as Mecca’s location is in southwest of the region). This could potentially initiate imaginative interpretations between Mecca as the center and the room as a point along the perimeter of an imaginative circle. Thus, this placement casts a sacramental dimension onto orosi as it becomes a lit window towards the divine light for the inhabitant-worshiper.¹³

¹² The conception of interior chamber was regulated by invisible constructing lines realized by brick units as discussed in Part Two. For the use of brick as units of measurement in design, drawing, and construction cost estimates see: Wilber & Golombek, L. & Wilber, D. 1988. (in Part Two of the dissertation). For various uses of units in of measures (in Iran) see: Pirniya 2010.

¹³ This room also appears with window openings of 3, 5, 7 framed by masonry brick construction. In this case each opening has two parts, the lower part that is like a French window and the upped part, often appearing as arched or pointed arch windows. The higher and lower parts are separated with a
The Outside

The garden or courtyard (hayat) identifies the outer space of the window. A sizeable vertical surface, orosi is located perpendicular to the longitudinal axis of a garden or hayat. At the center of the axis exists the reflective water. The geometrical watercourse is often framed by plants. The courtyard itself is the only opening of the house to the outside environment, the sky. As such, orosi can be interpreted as a window that opens to the aperture of a hayat, thereby becoming connected to the external world (Fig. 3.6, Fig. 3.7).

In the garden, water along the main axis flows and is delineated by the rhythmic presence of fountains. Close to the pavilion emerges the watercourse in the form of a larger water surface, which is the first appearance of the fountain inside the garden in a turquoise pool. Narrow and shallow channels direct the overflowing water of the pool to the main watercourse through the garden. At the end of this visual axis exists the gateway to the garden or another pavilion in the middle of the garden. This is an interesting place in the garden; the visual corridor is framed by evergreen trees that create almost a timeless image for the garden, while experientially being very temporal as one contrasts the comfort of the microclimate of the garden with the outside environment (Fig. 3.8). Using a poetic interpretation, one could imagine that the entire garden is built in order to represent microcosm, scenery for orosi to gaze at.  

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14 Contemporary idea of the gaze introduces it as a form of framing vision and mind specific to one thing, thus, isolating one from the world, while the traditional sense of the gaze sees it more of as ways of projecting self to the world and connects one with the world as a whole.
Fig. 3.6. Left: Space of the courtyard, hayat, Mahmoudi House, 19th century, Yazd, Iran. Source: Amraee, M. 2009. Right: study sketch of the room and the window as “eye” gazing at the scenery of the garden. Drawing by the author.
Fig. 3.7. Top: Studies to capture the two windows of orosi and the sky, each functioning as a plane while offering spatial depth through. Bottom: Reconstruction of orosi window: view to the outside and sky. Drawings by the author.
Fig. 3.8. Reconstruction of the space of the garden with the pavilion and orosi at the major axis of the garden. This space is a simultaneous temporality and timelessness, an imaginal space offered by the visual corridor framed by evergreens (no change of time experience) and the temporal aspect of the micro climate of the garden. This is the setting in which orosi is situated. Drawing by the author.
Fig. 3.9. Drawing exercise: Reconstruction from documents, memory, and imagination: Orosi window with interior space is lit by projecting light through the window. Above: a perspective view which accords to embodied experience. Below: an elevation view; in the foreground an abstract tree of the garden exist. Ironically the window (background) is demonstrated in a realistic view and the tree (foreground) in abstract form. Drawings by the author.
Sometimes extending from floor to ceiling, the *orosi* window inhabits the vertical threshold between the interior room and the courtyard. The openings are vertical quadratic slides within structural wooden frames, namely *latih, or darak*. In the Persian language, *latih* means a patch, a piece of clothing or textile, while a *darak* is a small door. A major frame holds the entire window structure, within which even subdivisions of 3, 5, 7, or 9 provide spaces for individual sliding panels with fixed divisions above. In a single window, the *girih* patterns of the sliding frames are often identical in form and in colored glazing. However, the pattern, color, proportion, and shape of the sliding frames (while often identical in one single window structure) can vary from one window to another. Later *orosi* of the 19th and early 20th century buildings also held vegetal patterns in their design.

![Fig. 3.10. Drawing of an orosi window (with five slide opening) showing the frame and its various components. Source: Amraee, M. 2009.](image)

The sliding frames (*latih/darak*), with 1:2-2.5 ratio (vertical) hold a variety of *girih* patterns. Each sliding unit is about 90 -110 centimeters wide. The size of *darak* varies in different buildings, regions, or among different craftsmen. Thus, the size of *orosi*, too, varied from one region to another and from one carpenter’s measuring unit to another. Oftentimes, a smaller rectangular major frame can be found within the *darak*, creating a square-like ribbon between the two frames (Fig. 3.11). The ribbon held geometric *girih* pattern or vegetal patterns. The inner frame would be comprised of *girih* patterns. In some cases, the smaller frame replaces the *girih*

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15 Often times the opening of the window is found only a few inches above the floor tile. That is due to the thickness of the lower horizontal wood frame of the window; therefore, the structure of the window literally occupies one vertical enclosure of the room.

16 In some occasions these opening sliding frames hold a wooden arch at their top, which seems to be later introductions of the late 19th century.
pattern and clear glass opens view to the outside as demonstrated in Fig. 3.11.

The third and fourth frames (in a hierarchy from large to small) are at the level of girih details, those that comprise the girih patterns. Individual figures (e.g., kite shapes) make up larger figures (e.g., stars), each serving as a figural aperture bordered by tiny wooden bars. These individual shapes have names that bear semantic attributes—perhaps dating back to the second period of life of girih (discussed in Part Two) in which the architect-engineer and craftsmen distinguished the individual shapes in girih patterns by names. In Iran of the late 18th and 19th centuries, the use of names for girih pattern was widespread. These forms were used amongst a variety of practices: masons, carpenters, tile-makers, and others. The following section discusses some widely used figures and their associated names (Fig. 3.12).

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Fig. 3.11. Left: one sliding frame (darak, or latih), House in Abyaneyh (central Iran), Right: Sliding module of orosi window of the Friday Mosque of Borujerd, Iran. Source: Amraee, M. 2009.

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17 This is verified through the surviving tradition of girih making by Lorzadeh and Sharbaf, who are from family of generations of master masons. For further study on this subject see: Lorzadeh, 2010; and Sharbaf, 2006.

18 It is very tempting to suggest that in the second period of life of girih in which certain patterns were used by architect-engineers, repetitive shapes were adopted as individual component units of girih pattern. However, evidence suggests that it is in the third period of life of girih in which these geometric pattern were prevalently used in a repetitive manner, and that individual shapes were recognized and carried names. This condition suggests that girih, once it had emerged from invisible construction lines, were assembled out of already known individual shapes, a design process distinct from those that relied on deadlines and use of compasses.
The higher section of the overall window is called *katibah* (lit. inscription, epigraph), and is fixed and non-operative. It varies in form and size due to the tectonics of the room ceiling structure. Some are found as arches and some are rectangular; the earlier case indicates a pointed arch structure holding the major frame, while the second one is an indication of a flat roof with wooden beams. *Katibah* is derived from the root Arabic term *k.t.b* (writing, inscribing), and is also a root term for *kitab* (lit. book). *Katibah* is an adjective emphasizing the notion of writing and inscribing. In this sense the non-operative of *orosi* is interpreted as a text in itself.

There are two type of *orosi* windows due to their sliding mechanics: plummet and non-plummet. In plummet windows (often found in large sliding apertures), a lead plummet via a string or chain facilitates the vertical sliding. The wood used in an *orosi* structure is generally from the plane tree, a native of the Persian plateau. The wooden bars maintain the same orientation as the tree trunk relevant to the sunlight;[^19] that is, the sun-exposed side of the tree trunk will constitute the outside of *orosi* window. Although this orientation is primarily due to the higher durability of

the wood when exposed to the elements, one could also relate the window to the to
the life of its material, wood, in semantic terms.

Shapes and figures resulting from girih interlocking patterns are filled with color
glass. Color tones include red, green, yellow, and blue (lapis lazuli). Amraee reports
that before the use of glass, waxed colored paper was used to achieve air insulation
while maintaining a translucent surface. Adam Olearius who traveled to Isfahan in
the 17th century wrote: “They [Persians] have not yet the use of glass, but in winter
they cover the frames of their windows, which are made like lattices, with oiled
paper.” Later, colored glass replaced these waxed papers. Pirniya indicates that flat
glass pieces were carried and imported to towns and regions that did not produce
flat glass. This made orosi a luxurious and precious building element.

On occasion, a white membrane was installed on the exterior side of the window,
protecting it from the elements. For this pulleys were installed to the very upper part
of the frame so the cloth would cover the entirety of the window, both the lower
sliding and the upper window head. The pulley had a cover made of clay. The
second curtain would protect the textile of the window (Fig. 3.13).

Fig. 3.13. Charmi House, Isfahan, Iran. orosi with curtain membrane. Source:
Monograph: Orosi, Habib, F.; Sherkat, F.; Safar Irani, A.; Ghahremani; A.,
1985. Shahid Beheshti University, Tehran, Iran.

The architecture of orosi is comprised of structural and material elements that
involve semantic attributes. The space of orosi, while providing a physical opening, is
also a window to the world of interpretation. Its elements carry anthropomorphic
attributes (i.e., heel of the window), the opening is a piece of textile (i.e., latih), and

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20 Amraee, 2009.
21 See: http://depts.washington.edu/silkroad/texts/olearius/travels.html#isfahan
22 Pirniya, 2010.
the upper part is a book (i.e., *katibah*)—all of which comprise a multilayered semantic space.

Crafting a Jigsaw Puzzle

The design of *girih* patterns in *orosi* window abide the same rules as other modes of *girih* pattern. The rectangular shape of the frame called for the use of repeat units to regulate the design of the *girih* window. This is verified by the oldest surviving architectural drawings to be directly applicable to *girih* window (and most likely an *orosi*), which correspond to designs that were executed by a Qajar Royal architect, Mirza Akbar, of the 19th century. These drawings show one module of a *girih* pattern for the window, a pattern that dominated most *orosi* of the time (Fig. 3.14). As mentioned in Part Two, *girih* at this time had already been reduced to certain patterns, which were repetitively executed by masons and carpenter and preserved in memory or via secret drawings. As seen in Mirza Akbar’s drawings, no sign of the use of un-inked construction lines can be found. Repetitiveness of certain patterns also affirms that not all known patterns found their way into the wooden structure. Yet, the window drawings were partial and relied on the carpenter’s imaginative reconstruction of the entirety of the window while on site.

Fig. 3.14. Window grills with *girih* patterns by Mirza Akbar, late 18th century. (Victoria & Albert Museum, London, Indian and South-East Asian Section, MS no.44.). Source: Necipoglu, G. 1995.
The process of making wooden girih is called girih chini (lit. knot making). The origin root of chini suggests arranging and placing—putting something into place in an orderly (and ornate) fashion, which is the same terms used by Persian masons for laying brick in place. Therefore, the act of making a wood girih finds connotations with the notion of place in the sense the each knot finds its proper and disciplined place relevant to a whole.\(^{23}\) The process of making wooden girih nevertheless does not fully correspond to the process of drawing a girih. In drawing, only the repeat unit of a girih is drawn. In the actual construction process, the entire window or image (which is comprised of a number of repeat units) is made at once and as a coherent construction unit. The difference between stages of executing girih in drawing and in wood can be associated with their intellectual and material levels of giving birth to girih, respectively.

A report from the preservation woodshop of Gulistan Palace (16th–19th c.)\(^ {24}\) sheds light on the process of executing girih in wood for orosi windows.\(^ {25}\) The patterns used in the original windows were almost identical to those of Mirza Akbar’s drawings. As evident in executing the window, the contemporary carpenters made

\(^{23}\) The relationship between part and whole in the execution of girih in wood can be seen at two levels: one in the construction of the overall girih pattern in which the polygon girih shapes are found within the initial grid structure (Fig. 3.14 upper images). At this stage the rectangular grid serves as a “repeat unit” of construction (which may not be the same as in the drawing). Each rectangle embodies one quarter of two intersecting polygons. Therefore, each rectangular, itself connects two polygons; thus the rectangular in repetition is analogous to a weaving polygons to each other. Another level of connecting part to the whole is found at the making of intersecting wood bars. The wood bars comprising radii project from the center node toward the perimeter. At the center point, the wood bars are cut in semi-diagonal way that could accommodate a zero thickness for such juxtaposition at their center. This sophisticated process is repeated in every single girih. Therefore, each node, depending on the number of intersecting lines, represents negotiation among wood bars to figure for the final diagonal cut. One can see the surface of the overall pattern as a result of a number of center points, which share similar shapes and construction.

\(^{24}\) The Gulistan Palace complex (Kakh-i Gulistan) is in Tehran dates back to the Safavid period. “In its present form, it comprises several different buildings and halls, including the following: the Imarat-i Takht-i Marmar, (also called the Marble Throne Building, Iwan-i Takht-i Marmar, or Iwan-i Marmar, 1759), the Khalvat-i Karim Khani (Karim Khani Palace, 1759), the Talar-i Almas (Diamond Hall, 1801), the Imarat-i Badgir (Wind-catcher Building, 1813), the Talar-i Aaj (Hall of Ivory, 1863), the Shams al-Imarat (Shams-ol Emareh, or Sun Building, 1866), the Talar-i Salam (Reception Hall, 1874), the Mouze-i Makhsous (Special Museum, 1874), the Talar-i Ayeneh (Hall of Mirrors, 1874), the Imarat-i Brelian (Talar-i Brelian, or Hall of Brilliant Diamonds, 1874), the Kakh-i Ab’yaz (White Palace, 1890), and the Chador Khaneh (Tent House).” See: [http://archnet.org/library/sites/one-site.jsp?site_id=11305](http://archnet.org/library/sites/one-site.jsp?site_id=11305)

\(^{25}\) Monograph: Orosi, Habib, F.; Sherkat, F.; Safar Irani, A.; Ghahremani, A., 1985. Shahid Beheshti University, Tehran, Iran. The monograph was the final research report of course project which included field studies. While the repairmen of the girih wood and orosi windows were attributed to Gulistan Palace, and the Marble Throne Building (c. 1759) but they did not specify the exact location in the building nor they did provide any further information in terms of drawings and visual documents.
the main frame, which embodies several numbers of repeat units. Then, main wooden bars that cross the plane and connect major elements of the frame were constructed, after which the smaller pieces were put together. This process of window construction seems to have been used by previous carpenters. The following figures (Fig. 3.15 and 3.16) portray the process of construction a girih window or a sliding frame.

Fig. 3.15. The process of constructing girih window. Gulistan Palace Restoration, Tehran, Iran. The process of realizing girih mode in wood distinguishes itself from that of drawing. The first stages start with creating rectangular grid, which also serves as structural support. Then, bigger and smaller patterns are added to the constructed frames. Source: Monograph: orosi, Habib, F.; Sherkat, F.; Safar Irani ,A.; Ghahremani; A., 1985. Shahid Beheshti University, Tehran, Iran.
The making of a *girih* window follows a different process from that of a *girih* drawing, which is principally associated with the different medium. From ink and paper to wood and space, the carpenter finds the execution of the material *girih* restricted to the rules of the material world: once incarnated into wood, the *girih* no longer lends itself to subtleness of paper and ink. The wood *girih* does not follow the repeat unit as a means of construction; rather, it requires calculations, making joints, and the consideration of a hierarchy for the lines of *girih*, since they become structural elements. The making of the *girih* in wood calls for other ways of imagining it compared to conceiving it on paper.
The craft of orosi is similar to that of a jigsaw puzzle; once completed, the entire image emerges in its totality. Essentially, the making of an orosi becomes a playful picture puzzle wherein the craftsman has to reassemble in wood and stained glass an image according to his imagination. Unlike in the picture puzzle where a clear facsimile (although in reduced size) predicts the final work, in orosi the drawings that guide the design do not resemble the final product. They direct a final scheme but are elusive enough to call craftsmen’s imagination at work to complete the orosi puzzle.

Imagining | Drawing the Window

_I have shown the picture of the [upper] half of one leaf. In drawing it [the picture of the door] I have not aimed for completeness. My purpose was to present a [general] arrangement so that it can be understood in the whole and in detail. One realizes that there is obscurity in the representations of solid bodies, but in the imagination one can fit one thing to another, view it from an angle, dissect it, and thus assemble it: step by step. All the drawings which I have made are simple, so that they give a clear picture. I show a drawing of part of what I have described, as I have done with the drawings in the other chapters, split into its separate parts._

- Ismai‘l ibn al-Razaz Al-Jazari (1136-1206)26

As discussed earlier in the dissertation, Islamic architectural tradition did not heavily rely on drawing elevations for buildings, compared to the West. Additionally, most drawings were either likely consumed during the construction process or are preserved in secret. Therefore, there are few architectural (design) drawings that exist that show elevation view.27 Similarly, there is almost no evidence of architectural drawings demonstrating windows that are comparable to, for example, those of Palladio’s study of facades or Serlio’s book of gates. Different from Western conventions, in which the Vitruvian _ideai_ of the elevation and its ornaments was demonstrated in _orthographia_, there is no strong evidence in Islamic culture of the existence of such tradition of design drawing for elevations. That is why there is a

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27 Only a very limited number of drawings in Mirza Akbar’s scroll drawings and a couple in the Topkapi scroll show partial drawings of an arched niche or arcade in elevation convention.
common belief that in the Islamic culture drawing a building design in its entirety (not as girih mode) did not go beyond plan convention drawings. In the recovered grid plans from 18th and 19th century Persian architects (now housed in the Victoria and Albert Museum in London), the vertical surface (i.e., orthographia) is not present at all, except for a modular indication in the plan. This suggests that perhaps “much of the construction process was improvised during the construction process following traditionally established formulae,” including what was to be visible in facades. I should be cautious here, though, since the tradition of using a grid system during the Safavid period as a tool of mensuration and cost estimation could have also been used by architects and masons to conceive the vertical surface, even at a very rough scale of haykal. I can say, however, that the entirety of the vertical surface of the building in full detail was not found on paper. Rather, the façade representation resided and grew in the architect’s imagination as the construction progressed—possibly with the aid of the grid system. This suggests an integration of the idea of design and material execution as almost simultaneous as the façade was being erected. The design of the ornaments and windows, while part of the façade, were different due to their geometric and pattern nature.

A rare door design drawing from the 12th or early 13th century from al-Jazari demonstrates sophisticated use of girih in a cast metal door (Fig. 3.17). Al-Jazari’s description on his intention for not portraying the entire door and emphasis on the viewer’s imagination to construct the image as a whole is informative. This advocates both for the existence of the concept of repeat unit, as well as for using that unit as a vehicle to perceive the entire image of a design. It also suggests that (at least since his time) other craftsmen would rely on this method of partial drawing. The geometric nature of the design as well as recurrence the girih in the larger door pattern (i.e., use of repeat unit) provided visual clues, enabling the viewer to reconstruct the absent parts of the drawing into one complete image.

28 Among those I could refer to Necipoglu’s study on Islamic architectural drawings, where very little is found on design drawings pertaining to facades. Miniatures paintings or drawings illustrating facades cannot be considered as design drawings since the intent was not to lead to construction.


30 This is perhaps the only surviving drawing showing use of girih specifically indicated for a door or window, which is older than the one by Mirza Akbar. Neither Tashkent nor Topkapi scrolls are accompanied by written notations. In those drawing, certain patterns allude to use of girih in wooden structures.

Other indications of window representation in Islamic architectural drawing are found in Ottoman architecture. In plan drawings of Ottoman baths of the 16th century “iron latticed windows are indicated by cross diagonal lines within the thickness of walls” 31 (Fig. 3.18). While Necipoglu’s studies indicate that those drawings were probably executed at the request of a humanist Western patron who commissioned the baths, the drawing still indicate that demonstrating screened windows on a plan was common, or at least known, among the Ottoman architects of the 16th century. 32 In another plan of a textile workshop of the second half of the 16th century, which is kept at the Topkapi Palace Archives (Istanbul, Turkey), the metal latticework of the windows are also noticeably marked in the drawing.

31 Ibid. 226.
32 Necipoglu discusses the possibility of an Austrian patron who might have commissioned the bath to Ottoman architect. See: Necipoglu, G. 1986.
These examples of the screened window drawings suggest that the roots of this tradition of drawing windows on a plan preceded the 16th century, as evident in a drawing of the second half of the 15th century of a partial plan of a royal mosque, in which the windows are marked with a checkered grid (Fig. 3.19). Among other plans is a double bath “with arched windows in elevation.” The plan drawing of this bath utilizes a more dated convention – yet visually and imaginatively intriguing – and does not show any indication of screened latticework on windows (Fig. 3.19). Considering that the tradition of showing elevation of windows in plans was also a known practice among Islamic contemporaries in West, one could suspect that Islamic architecture, and in particular Ottoman architects, had borrowed this representational convention from the West.

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33 This drawing can be considered as one of the oldest surviving architectural drawings in the Islamic tradition representing plan drawing convention.
Fig. 3.19. Left: Partial plan of an Ottoman royal palace with windows marked as checkered grid, 15th century (Topkapi Palace Museum). Right: Plan of a bathhouse with arched windows shown on plan, 16th century (Topkapi Palace Museum). Source: Necipoglu, G., 2005.

Additional visual sources for studying the presence of the screened window in Islamic edifices are paintings and miniature drawings. While these drawings are essentially different from architectural (design) drawings in intention and purpose, they still are informative in terms of communicating a general idea regarding shape, spatial situation on façade, tectonics, possible juxtaposition with other materials or elements, and more (Fig. 3.20). Miniature paintings of *girih* windows remain valuable recourses and narratives for understanding their range of use, and the significance of the window in Islamic culture as a strong metaphor. The semi-axonometric/semi-isometric space of the miniature painting offers concurrent readings of surfaces and spatial depth. Nasr indicates that the space of the miniature is that of the imaginal.34 Objects, humans, plants—all of which belonging to epic stories—are depicted in such a way that could be interpreted as imaginal bodies, a visual context, in which *girih* windows also appear frequently.

Elaborately portrayed as elevation in paintings, the screened *girih* window occupied a prime status in Islamic architecture and culture, although almost non-existent in the conventions of architectural representation—except for rare occasions as diagonal grid in plans. This becomes more interesting when one observes the dominance of sophisticated tile-work, stonework, and brickwork ornaments in facades of the edifices of the time, all of which are modes of material *girih* work, but are not included in the plans for facades.
In the absence of architectural drawings of window elevations, one wonders if the relationship between grid plans and the actual design of the window can be viewed as an indication of the imagination and skills of the architects, masons, or craftsmen who made these windows. Partial *girih* drawings constituted the visual representations of the vertical surface, and maintain a non-transparent association with plan drawings. While plans demonstrated a more rational, practical scheme reinforced by a grid system, the vertical surface continued to dwell in the richness of infinite possibilities offered by *girih*. The design of the vertical surface, relying on grid system drawings the one hand, and on *girih* drawings (with no established scalar relationship to the building) on the other hand, could be considered as somewhat elusive in nature. It is under this condition that the entirety of *orosi* window had to be conceived and negotiated between rough erecting masonry walls and delicate patterns. The former, at best, provided a very undetailed estimate for the façade and the latter a partial drawing of *girih* pattern (i.e., repeat unit) of the window or ornaments. The relationship between the two was most likely completed at work, while the elevation design likely relied on experience, memory and imagination.

The design drawings of *girih* windows, thus, were all similar in that they represented variegated forms and colors nurtured by the imagination of the craftsmen and artisans who made those object *girihs*. They perhaps used their secret scrolls in creating windows, and most likely had some primary drawings of geometric patterns at their carpentry shop. Nevertheless, as al-Jazari described centuries ago, the rest of the drawing became completed in the carpenter’s imagination, leaving a tradition of making variegated shape and colorful windows unmarked on paper.

It was the imagination of the maker who saw in the plan windows that had been erected vertically, facing the light to project into the interior room variegated shadows—thereby turning the room into a feast of light and color (Fig. 3.21). Indeed, light projected from the well-proportioned *girih* is a reminder of Ibn al-Haytham’s theory of aesthetics. The *girih* window drawing, with its elusive presence in various modes of visual representation, remained a subtle existence in the world of drawing conventions in the Islamic world.
Fig. 3.21. Imaginative representation of the cast light into the darkness of the space without referencing the material window. Drawing by the author.
INHABITING THE SPACE OF OROSI

The theophanic concept (by no means limited to some speculative scholars, but shared by all the spiritual circles where the Apocrypha flourished) is that of an Apparition which is the transparition of divinity through the mirror of humanity, in the way the light only becomes visible by taking shape and showing through the figure of a stained glass window. It is a union that is perceived not on the place of perceptible data, but of the plane of the Light which transfigures then, that is, in the “imaginative Presence.” Divinity is in humanity as the image is in its mirror. The place of the Presence is the consciousness of the believing individual, or more exactly the theophanic Imagination invested in him.

-Henry Corbin

Fig. 3.22. Imaginative drawing of the materialized light as crossing through stained glass. The invisible light, the window (agent of materializing) and the color pattern all are considered as one. Drawing by the author.

A Subtle Substance

Having been nested in thick brick walls for centuries, orosi windows provide glimpses of the outside via comparatively thin and delicate materials that are able to deliver variegated light in confined shapes and figures. Such a seemingly thin plane vividly projects light into the depth of the space, painting anamorphic washes of

color on the wall and floor, thereby expanding the sensual experience of the outside to the depth of the enclosure. The projected light, while in motion throughout the day, becomes an eternal image at single moments, making the projection residing between temporal and eternal modes (Fig. 3.23). *Orosi* features an assemblage of frames within frames, shapes within shapes, each dealing with the potentiality of spatial depth. It invites the viewer into multilayered sceneries, with the window as a whole, individual *girih* frame and shape, and groups of *girih* patterns unified by means of stars and polygons associated by color and proportion.

Fig. 3.23. The projected light appears a temporal phenomenon leaving anamorphic washes of light (left) while at every given moment certain colors and/or shapes are projected and touch center places in the space inside (right). Red color on the window is projected to the corner of the room. *View:* from back of the room showing inside space with the window in the background. Drawings by the author.

The window in its entirety offers a variegated two-dimensional *girih* pattern. The reading of the window, here, is beyond monocular sight. Elaborated by stained glass, stars and polygon *girih* patterns highlight the symbolic presence of the celestial spheres indicated by such Islamic thinkers as Ikhwan al-Safa.\(^{36}\) Meanwhile, with each shape associated with a certain name, *girih* holds semantic attributes relevant to the material world. The presence of vegetal patterns, a direct reference

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\(^{36}\) Ikhwan al-Safa’s associations with Pythagoras regarding the geometry and the celestial orbits were discussed in Part One.
to the world of phenomena in orosi window, pertains to a mimetic act from natural phenomena. These are allegories directing the viewer into the realm of gardens, which are invisible (Fig. 3.24). Therefore, one could infer that the orbit-like forms that once would suggest cosmological orbits, now could be read as objects of the material world. The former suggested an anagogical relationship between the visible girih and invisible intelligible cosmos (or structure of divinity); the latter suggests an allegorical relationship between visible plants, as if the window paintings were of real flowers in garden. This has unique implications on the reading of girih and orosi windows; in which girih no longer merely stands for the higher intelligible word, but also for the material word, which implicates its role as a medium holding attributes of both worlds. This dual function, granting allegorical and anagogical functions to the final composition, also accords to the psychological and cosmological functions of the imagination.

Fig. 3.24. Vegetal pattern in orosi window. Aminiha Hosseiniyeh, Qazvin, Iran. Vegetal forms in Orosi, while still semi-abstract, suggest a direct reference to the world of phenomena. This can be interpreted as mimetic act, in Gamader's sense. It is not a replica but a recreates and representing it in a new thing.

Orosi, comprising two main material substances (wood and colored glass), concurrently features the temporal world of phenomena and the intellectual world of timelessness. Once a living substance and now subject to decay, the wood represents the material world while geometric patterns and light call for perpetual beauty and truth. In-between exists the colored glass, transforming invisible lux to visible material lumens, which pertains to an imaginal substance. While the window itself is perhaps the least material substance in the building (i.e., an opening violating the think masonry enclosure of the building), the materials used in the window also represent less solidity and substantiality. The wood is a soft material, less physical than that of brick and stone. The glass can also be viewed as a less
material substance in terms of transparency but more material in terms of its hardness and endurance. Glass as a subtle architectural substance has attracted many contemporary architects’ and artists’ attention—Bruno Taut and James Carpenter, to name a few. But the notion of glass being as subtle and possibly “imaginal” probably existed among architects and craftsmen of the Islamic world for centuries.

Al-Ghazali’s interpretation of the glass as a subtle imaginal existence is revealing here. Drawing from the “Verse of Light” (Koran 24:35), in his Niches of Lights (Mishkat al-Anwar), he deploys a set of metaphorical imagery in describing the constitution of the self as “five luminous human spirits” (al-arwah al-bashariyah al-nuraniya). The Verse of Light filled with imagistic depictions of levels of God’s existence has attracted many Islamic philosophical thinkers:

God is the light of the heavens and the earth.

The simile of God’s light is like a niche in which is a lamp,

The lamp is in a globe of glass,

The globe of the glass as if it were a shining star,

Lit from a blessed olive tree

Neither of the East nor of the West,

Its light-giving oil nearly luminous

Even if fire did not touch it.

Light upon Light!

For al-Ghazali each of these similes, i.e., niche, lamp, glass, tree, oil, is represented by a “spirit” (ruh) and has a function. The niche is a simile for sensory spirit (sensory existence), the glass for the imaginal spirit (imaginal existence), the lamp for the rational spirit (rational existence), the tree for discursive spirit (anagogical existence), and the oil for prophetic spirit (essential existence). Mystics of the Islamic world have also assumed similar five levels of existence, with often the imaginal between

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37 Moosa, E. 2005. Al-Ghazali also corresponds these five levels of the spirit and existence essential for his existential hermeneutical paradigm. Moosa explains that for al-Ghazali “in order for an interpretation to be valid it must correspond to any one of five interpretive registers of meaning, namely, the essential, sensory, imaginal, rational, and anagogical.” See Moosa, E. 2005: 228.
the visible and invisible. The function of the globe of glass here is subtle; it mediates between the lamp and the niche, the earlier projecting light and the latter capturing and reflecting it. The globe of glass itself becomes an imaginal existence that would appear as a shining star, with its luminosity owing to both its materiality and its sides (i.e., lamp and niche space), making it an in-between subtle existence. Key here is that the globe of glass magnifying the light has two components: the globular spherical form and the substance of glass, which presents in co-existence the two essential elements of the imaginal. The glass with its variegated appearance turns the girih window into an imaginative web of forms and meanings. It is the subtle nature of the glass that provides visibility, transparency, shininess (reflection) —all of which project at the same time, making the window a mysterious filter between the self and the world out there.

Fig. 3.25. Left: Globular light fixtures in a mosque in Cairo. The analogy of the light bulb is continually employed in the design of mosque structures. Right: Tabatabaie House, Kashan, Iran. Patterns of projected light through the girih window reveals the window as a magical screen between two worlds.

Composed of wooden elements and colored glass, the patterns in orosi suggest the formation of shapes and figures, both through the outer perimeter (defined by wooden bars) and through the interior surface shape (defined by glass planes). During the day viewed from inside, the wood is perceived in dark shadow and the lit glass as a bright and vivid surface. The shadow perimeter lines and the bright plane of the glass mutually define shapes in the girih pattern. The border between the light and shadow, as Ibn-Arabi states on the separating line between light and shadow, is an isthmus (barzakh), which belongs to either side or neither side.
As Henry Corbin reminds us, the process of theophany, that of the Creative Imagination, is analogous to the experience of the stained glass window, since both must be experienced through incarnation into the material world. This window, with its various shapes and colors makes the light more tangible as forms and shapes. Each color and shape, in Islamic theosophic terms, alludes to a face (vajh) of the intangible, while the essence of the invisible (divine), the source of light, does not hold shapes and colors. This is the space of the imaginal where the invisible light becomes visible, holding shapes and colors without being fully incarnated into the material substance. Orosi, viewed from this perspective, is an in-between that guides us to experience mundus imaginalis. Metaphorically viewed, orosi is a thin, delicate, and subtle substance mediating between the material world of the building and airy world of the outside. We can infer multiple levels of meaning for this window and the worlds it mediates: The window mediates between the heavy solid materials of inside and the immaterial space of outside. Allowing the invisible to be incarnated, the window also transforms the exterior lux to the interior lumen. This function of the window is analogous to that of drawing in mediating between two modes of existence, idea and thing. In this sense, one could see the inside to be associated with “thing” and outside with “idea.” The girih window, nevertheless, alluding to theophanic function and existence, becomes an analogical representation taking the viewer to a higher essential existence. Within the material world, the window, however, mediates inside and outside, room and garden.

Between Gardens

The perception of the geometric patterns in orosi window is slightly different from the drawing girih, and that is due to the element of color. One can distinguish multiple layers of reading within the girih window. The first layer is the wood girih pattern, which comprises the entire window including clear openings to the outside. A second reading is the layer of color, which groups shapes and figures and suggests certain conceptions of the star-and-polygon geometric patterns; it appears as a combination of multi-pointed colorful stars connected by a geometric web of
muntins. This makes the appearance of variegated *girih* equivalent to an abstract garden (Fig. 3.26 left). Interestingly, the variegated drawings also used natural colors often from the landscape elements, making them close to a colorful garden. The presence of vegetal forms, either as the main pattern or peripheral framing patterns in *orosi*, and the use of star-and-polygon *girih* patterns codified by colored glass (as a visual reminder of a garden; i.e., allegory) further associates the colored *girih* patterns to an abstract garden. Yet, the abstract nature of the patterns prevents it from falling into a literal portrayal of garden space. In this sense, the second layer of colored pattern also becomes an analogical vehicle to ascend the viewer to the ideal heavenly garden (Fig. 3.26 right). While the first layer is the literal material *girih*, the second layer has elements of materiality through colored glass and immateriality, as it becomes a perceptual layer.

Additionally, the multi-aperture *orosi* instantaneously captures the garden outside through the lower frame sashes. From inside, the bright variegated patterns along with the sliding frames create a mesmerizing experience, pointing to the simultaneity of the patterned window and outdoor environment. When completely open, *orosi* becomes an opening to the garden. When fully closed, it becomes a window to the light, to the sky. Offering both views in *orosi*, the lower space provides a framed view of the real garden, while the upper part frames the gaze of the viewer into a realm of abstract forms. Swinging between the material and
abstract portrayals of the garden, the Orosi embodies the sensible while hearkening to the intelligible.\footnote{The performance of orosi is not just limited to the sense of sight. The relatively shaded space of the interior providing shelter from the burning rays of sun, or the warmth of the space and wood in a cold winter date are other aspects of an embodied experience. The odor of old wood or wet wood is also sensible in the space. One of the most intriguing moments is the inter-sensual experience: imagine an afternoon tranquilly that is soundless inside while turbulence of colors, hearing and sight receive various messages from one single architectural experience.}

Through the open window, one can see the physical environment outside, which is often an ornate garden seen on one of its major axes. Therefore, the view from inside out captures a framed, realistic view of the garden. This is a stage in which the garden is literal and is outlined by the window. Paradoxically, the literal garden appears when the orosi slide frame (window sash, latih) is absent (i.e., in sliding up position). The coexisting multiple levels of reading the window, the literal/material and the spiritual/intelligible levels, are synchronized through an intermediary experience, the imaginal (Fig. 3.26). Melding the two ends of the spectrum of understanding (sensible, intelligible), orosi suspends the viewer between two extreme conditions, physical-spatial and spiritual-intellectual. Starting with the physical embodiment of the space, a culmination of the experience is when one would find himself/herself in the imaginal space, between the pleasure (of the earthy garden) and joy (of the ideal garden). Fluctuating between the two gardens, a third layer of reading orosi emerges: the imaginal. This third level of reading invites the viewer to participate in the imaginal—observing the two simultaneity of gardens while inhabiting a third garden in one’s subjective mundus imaginalis, a space of allegory, a fable narrating and composing a garden of real plants and substances with a figurative landscape of symbols. In reading orosi, the window offers three levels of spaces: literal orchard, allegorical garden, and anagogical paradise.
Orosi represent a veiled window that invites the viewer to unveil invisible landscapes within it, offering a simultaneous experience of the *perspectiva artificialis* (to the world of the phenomena) and the *perspectiva naturalis* (shapes and forms). This concurrent engagement of the intellect and the senses requires an in-between cognitive faculty, which is the imaginative faculty. Historically loaded with spiritual dimensions, the geometric patterns become anagogical vehicles to unveil understandings belonging to symbolic domain. Stretching to the intangible spiritus, the faculty of imagination exceeds its psychological function and engages cosmological interpretations. That is how the experience of *orosi* is integrated with the act of active imagination and the imaginal. The screen of *girih* makes the window

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39 The power of engaging the intellect and senses, has also been affirmed by many western thinkers, Abbot Suger, Marsilio Ficino, … to name two. Seyed Hossein Nasr indicates similar conceptions on *perspectiva artificialis* and *perspectiva naturalis* in miniatures paintings. He argues that the space of miniature painting is the space of the imaginal since both of the above-mentioned views are found in miniatures and are unified through the imaginal. See: Nasr, H. 1987.
as an observant eye, a lens to penetrate the invisible, a material medium to capture qualities of the immaterial and make it tangible.

The Image | Space: From Planar to Perspectival

The experience of the outside is interconnected with the experience of the window itself. The window offers a multiplicity of apertures to the outdoor space: a literal connection through the threshold when open, and when closed through the transparent colored glass screen through which one can see actual fragments of what is outside mixed with the images of colored glass. The literal opening, offering a perspectival view, engages the viewer in an embodied experience with the physical space. This is a view that immediately links the viewer to physical attributes of the space (i.e., size and proportion, spatial depth, orientation, etc.). Viewing partial, segmented, and colored outdoors through smaller frames, however, establishes a different set of relationships between the viewer and the surrounding environment. These fragmented images are placed on a surface, perpendicular to the viewer's sight. The surface also creates a whole, a larger image comprising of colored girih patterns. This image, complete in itself, invites the viewer's eye to rove over the surface (Fig. 3.28). Once experienced together, the real and the figural views blend and the imaginal view emerges.

Fig. 3.28. Left: Orosi offers literal view and filtered view to the outdoor environment. Right: Study diagrams of the two simultaneous views to the garden.
Significant to this experience is the simultaneity of the depth and surface, both of which offer targeted visual and spatial destinations. Unlike the stained glass windows of the great gothic cathedrals that offer a two-dimensional spiritual narrative, or contemporary picture windows that frames a three-dimensional landscape, orosi offers both at the same time. Suspended between the surface of the abstract image and the depth of the material garden, the viewer finds himself/herself betwixt the space of girih and space of the garden.

In other words, sensing the interior room becomes integrated with that of the geometric patterns of girih, for orosi dominates the experience of the interior room. As the light passes through colored glass, becoming more tangible, the viewer finds himself/herself between the window surface and the projected image onto revetments. This is a stage that the more materialized color is still in the air and has not yet touched wall surfaces, a transitional condition in which the pure light crossing through colored glass while not fully lending itself to the material world (Fig. 3.29). Hence, it is comprehensible to the embodied viewer.

Fig. 3.29. Imaginative reconstruction of light rays and projections in space, while they have not yet touched the surface. This is a mode of existence subtler than a lit surface. Drawing by the author.

40 Corresponding to the Verse of Light, this stage can be viewed as the space-moment between the glass bulb and the niche, where the light passes through the glass but does not hit the niche surface. Indeed this is all based on imaginative contraction of the space, a mode of discourse permitting the use of metaphors in interpretation. While different from discursive reasoning, this mode of thinking is prevalent in the design process and the creative act. That is why I employ it as a means to unfold a way of thinking and understanding that is appropriate in the design process.
The interior room becomes a dark chamber receiving illumination by variegated light. The space of the room is the space of the projected *girih* pattern to creating a three-dimensional space. Blurred anamorphic projections of *girih* patterns on walls and floor vividly inhabit the interior room: revetments become almost identical with the projected bright and moving patterns of color. This kaleidoscopic projection offers a rich experience and becomes an integral part of understanding the room (so that imagining the room without these projections becomes almost impossible). Oblique projections with their bright presence in the space distort *oroși’s girih* patterns, thereby introducing a new formal order inside the room. A colorful world in itself, the room becomes detached from the exterior environment, an experience almost comparable to Bruno Taut’s glass pavilion.41

Fig. 3.30. Left: Bruno Taut’s Glass Pavilion with the interior space lit. Right: House in Yazd with the interior space lit.

From a planar view, the cast light (on wall and floor) is an oblique image of the *girih*. Hence, one often experiences a distortion of the oblique as the projected image is

bound to rules of perspective, suggesting the source of light as the vanishing point for the constructed perspective. Oblique lines, bright colors, and blurred projections are juxtaposed next to their source of origin, the window, thereby creating an imaginative space between two realities of the material girih image and the projected image on revetments; each also exists on a different spatial plane, i.e., vertical vs. horizontal (Fig. 3.31). With the temporality of the sunlight, the rainbow-like patterns move and shimmer around the interiority of the room, creating kaleidoscopic space inside the room, turning the room into a magical space (Fig. 3.31). This magical quality indeed owes to the subtleness of orosi, becoming a prism to reveal the spectrum of light (Fig. 3.32) and casting it onto vertical and horizontal planes of the room, an attempt to unify them by the projected image (Fig. 3.33, Fig. 3.34, and Fig. 3.29 right). If viewed tectonically (in the context of masonry construction of the present study) the floor and wall each belong to their own ontological realm, yet through a poetic interpretation, the intermediary projected image onto both planes creates a third plane of reality, while interdependent on the two, is valid on its own and connects the other two.

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42 The experience of the window from outside is similar to that of a girih pattern in most architectural revetments. That is due to the relative dark appearance of colored glass framed next to a lighter appearance of the wood. Unlike from inside, one could barely comprehend presence of the color in orosi window from outside during the daylight. Therefore, perceptually, orosi features two very distinct appearances to the inside and outside worlds.
Fig. 3.31. Recreation of the two planes of images: one the vertical window polychromatic *girih* and the other the projected image onto the floor. Drawing by the author.

Fig. 3.32. Recreation of the kaleidoscopic experience of the room, attempt to capture both the temporal and stillness nature of the projected image. Drawing by the author.
Fig. 3.33. Recreation of the window as a prism collecting the light and variegating them into the interiority of the room. Drawing by the author.

Fig. 3.34. Recreation of the room in parallel projection viewing the side wall and partial floor with the projected image of the light on the wall and floor. The thin imaginal layer of light projection inhabits horizontal and vertical plans (i.e., floor and wall) and makes them subject to homologation. Drawing by the author.
Fig. 3.35. Imaginative reconstruction of penetration of color light substances into the darkness of the room. Drawing by the author.

Fig. 3.36. Imaginative reconstruction of penetration of rays of light, and their projection onto a surface. Smaller denser colors denote planes of glass and larger squares are projections on the imaginary surface. As evident, projected lights form an orderly matrix, from random glass origins. With rays of light in various directions, one can imagine that the drawing captures sun-light in different times through different glass frames, so the final projection would create a grid of squares—something that in reality is impossible. Drawing by the author.
GIRIH AS WINDOW

Fig. 3.37. In drawing girih, one finds himself/herself at multiple realities; one the physical body who executes the drawing, another reality pertains to the imaginary self that stands at the center of each concentric patterns. This is a scale that the projected self maintains a different scale. There is also another self who views the execution from outside world and imagines girih in material mode. Drawing by the author.

Drawn on the light, orosi is a material incarnation of the girih. It is both the girih and a representation of it. In Ibn Arabi’s playful interpretation, it is both and neither. This interpretation ontologically assumes the window to be an inhabitant of an in-between realm. Inasmuch as the architecture orosi is based upon geometric patterns, it is a girih in itself. But to the extent that its executions and creation is different from a girih on paper, it is not the girih in its intellectual mode. Therefore, it is neither a reduced image of girih nor its full existence. Such an interpretation can be true for girih drawing too: that a girih drawing itself is an in-between existence,
between the world of ideas/concepts and world of substances/construction. This drawing connects the making of things to ideal forms and conceptions. The *girih* drawing with its airy existence on the parchment or paper is a subtle existence at many scales.

In its inception, drawn from the domain of mathematics and appropriated for practical geometry, the *girih* drawing reserves a subtle mathematical nature, yet is not purely mathematic. The *girih* is an outcome of the science of ingenuity for transforming the ideal into the real, and appropriating raw materials, by means of *hiyal*, into pure and perfect appearances. It requires an insightful understanding and knowledge committed to imagining the material world in a perfect form with a will to transform the substances to that ideal imagined.

Throughout history, architects’ scroll drawings were furtive palimpsests and recordings of master patterns kept in secret. While they existed, these drawings were esoteric to patrons and apprentices, making them mysterious realities whose existence were verified by the masters’ skillfulness and realization of a structure. History remembers *girih* drawing as absent presences. Completed by memory and experience of the master, *girih* drawings served as reminders or gateways to a world of imagination and secrecy of master masons through history.

The proportional system governing conceiving the *girih* pattern released it from bounds of size pertaining to the material world, granting it an immaterial dimension to freely dwell in an unrestricted world. Hence, the proportional relationship to the design of revetments made *girih* a very convenient and practical vehicle to be associated to the material world. Many examples of the use of the *girih* on flat and curved surfaces exemplify convenient transformation of *girih* into the world of material substances.

The execution of the *girih* also speaks to delicacy. On paper, the use of un-inked construction lines creates a mode of very ethereal existence, upon which the final pattern becomes tangible. In the construction site, the use of punched paper and charcoal dust as tools for realizing *girih* patterns on the floor features an ethereal process by which the drawing is born into the material world. The shapeless
powdery atmosphere will deliver the drawing once it passes through the dotted lines punched on paper.

The *girih* drawing, while complete in itself, simultaneously awaits materialization (i.e., art of the Book illuminations, woodwork, tile-work, etc.). Therefore the *girih* is *one* and *many* at the same time; one essence and many appearances. The *girih* drawing by itself is an essence and an authentic mode of being, while lending itself to various material existences. That is why, perhaps, that it has also evolved into an interpretative tool for mystic and religious interpretations of the divine, as being one in essence (*dhat*) but many in appearances (*vajh*). The *girih* drawing is essentially a material being in the sense that it requires a paper and ink medium in its creation. Without being drawn, the *girih* does not exist. Therefore, the idea and its materiality are not two separate entities; they are essentially the same. Additionally, that the *girih* drawing does not suggest a transparent connection to the built work makes it maintain closer association to the realm of idea and ideality. While the *girih* drawing awaits further articulation (i.e., scaled, and adopted to the appropriate use in the building), it becomes a means to realize other things.

The *girih* drawing resides between the world of ideas and of materiality, as such, it is complete only in the imaginal world, a realm where in the *self* participates and conceives a unified understanding of a plane of existence grounded in the geometric mode. The *girih* drawing characterizes the notion of *a.q.d*, a commitment to both sides of seen and unseen, tangible and intangible, and sensible and intelligible. The *girih* drawing initiates a journey to the world of interlocking patterns, shapes, and figure, and becomes a window to the world of meaning. The *girih* drawing is a subtle existence (*jism-i latif*) that brings together the two sides in a middle land, the imaginal, an ontological monarchy subsisting inter-dependent from the world of phenomena and pure intellect. As such, the act of drawing *girih* becomes an act of worldmaking; conceiving and executing a subtle material being simultaneously.

The *girih* drawing in itself challenges the question of representation in the sense that it is not a reduced form of something more authentic; nor is it the incarnation of the material world. To the extent that it is not a less authentic form of existence, the *girih*
drawing becomes the only possible way of bringing forth an idea or thing, while with a potential of becoming a multiplicity of materials, it becomes both the thing and representation of the thing. Consequently, the girih drawing is/is not the thing. Such an understanding of the girih drawing conceives the architectural representation distinct from the major existing paradigms.

This perspective distinguishes itself from the reductionist view of contemporary culture in which drawings are often considered as neutral tools and less authentic representations of future buildings and landscapes—this is a view that privileges the built and regards the drawing as secondary. This view of the girih drawing is also different from interpretive paradigms in which the (first) representation is regarded as authentic and the only means of reaching an idea or thing. This outlook essentially argues for both or neither, concurrently.

The emerging paradigm for architectural representation argues for initiating the drawing from the in-between realm, the imaginal. The imaginal drawing does not necessary starts with pure reason, rational judgments, verbal ideas, or critical thinking. Nor does it start from merely sense perception, material affairs, quantifiable issues, or spatial standards. The imaginal drawing starts from its own world as middle ground, driven by and of imagination, connecting the two sides and claiming its own ground. The imaginal drawing is both a representation of the construction and a constructed representation or neither of them.

As such it is both a representation and the knowledge associated with it—or neither of them. The imaginal drawing is an embodiment of what we would call architectural knowledge. Yet it is not absolute, but rather a state of transformation. Belonging to the imaginal, the drawing and the embodied knowledge are subtle entities in a state of becoming. As such, the architectural drawing and knowledge are always between moments of evolving. In this view, the imaginal drawing, while suggesting a reality, awaits evolving into another. The imaginal drawing asserts a stage of existence and consciousness of the self and the world in which designer and the design become identical.

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43 If only viewed as “the thing,” girih drawing can also be viewed as a symbol of the invisible.
44 The Cartesian perspective promotes the earlier view and Gadamerian hermeneutics is associated with the latter perspective.
Understood as a world of in-between, the imaginal has multifaceted effects on how we can look at the drawing in our present day practice. A state of subtle matter, a state of being-becoming, the imaginal insists on an in-between residency, between a duality of poles, and claiming it as a real world. It is both of the sides or neither of them. Viewed this way, the imaginal drawing also pertains to both sides or neither. El Lissisky’s Proun drawings as between drawing and building are remarkable examples of drawings alluding to the imaginal. Frascari considers them as “enigmatic expression of the power of the mundus imaginalis,” wherein “visual imagination establishes true and real thoughts.” El Lissitzky’s Proun’s “immaterial materiality,” are two-dimensional representations that escape the two-dimensionality of the paper and take the viewer to a higher realm of understanding. I find similarities between the Proun drawings and some of Paul Klee’s representations, where he strives to re-create entities on the surface of the paper. His “window” on canvas is an elegant example, wherein he regards two sides of the canvas: the interior of the window (the viewer looking at canvas) and the exterior (back of the canvas). His careful application of white color to the back of the canvas resulted in penetrating white cells onto the painting surface, similar to the penetration of rays of light through the tiniest opening, creating shining effects. Here, I would like to contemplate some of the characteristics by which a drawing holds imaginal attributes.

45 Frascari, M. 1993a: npn
Fig. 3.38. Exercise on Line and Light, with Ibn Arabi’s notions on the “line between light and shadow” in mind, these drawings attempt to capture space through various colored lines. Unlike conventional drawings, that line is a sign to define the confines of physical spaces/objects; colored lines aim at demonstrating reaction of spaces/objects relevant to the projected light. The bottom drawing attempts to capture the first immediate hits of the golden color on the glass frame (yellow). This exercise calls for a new approach to the design process, one that recognizes the temporal nature of the building. As such, the designer engages in an experience that holds imaginal attributes: one that urges the designer to span time and matter through imaginative faculty. Drawings by the author.
Fig. 3.39. Exercise on realizing a screened window at two extreme scales of experience. The projected self into the space allows for close-up views through planes of glass (top) while engaging the site in multiple directions. Lines implying conic spaces suggest bodily/sight movements. At a different scale (bottom), the drawing demonstrates the building from below, a reality that comes into existence only through imagination. Drawings by the author.
State of Form-Formation :: Realm of Potentialities

A conventional view of the architectural drawing presents it as having little value to thinking and imagining the invisible “other” within the drawing. A non-trivial drawing, however, becomes a source of contemplation and discovery for the architect. Perfectly seen in the case of girih drawing, such non-trivial representations are not restricted to an established relationship between the drawing and the built work merely based on visual paradigm, i.e. like-ness. Rather, they become vehicles of further mediation, arguing for all possible understandings that could emerge from the drawing. Therefore, such drawing becomes a domain of potentialities, since at any given movement and through every individual’s mind, they can reveal intangible aspects to the realm of visibility. An imaginal drawing is not about the final represented form on paper; rather, it is about the potentialities within those lines and forms. In other words, an imaginal drawing does not merely limit itself to show a future building but the potentialities of that building, they ways it could be. In this sense, an imaginal drawing, while holding certain forms, is indeed a state of formation. The formation occurs while executing the drawing and afterwards when interpreting it. That is how the drawing in itself represents simultaneity of being and becoming, giving rise to the static as well as dynamic attributes of the visual document. This accords to the mundus imaginalis, in which the imaginal being pertains to a realm of potentialities rather than one single mode of material existence.

The Subtle Drawing :: The Imaginal Self

Almost any drawing in the physical realm, although very subtle, is a result of some kind of construction. In executing the drawing, one uses paper, ink, graphite, and more to bring it to existence. Such drawing tools as ruler, triangle, and compass are also utilized to regulate the precision of the final constructed drawing. The paper is first and foremost a site. The perimeter of the paper defines an immediate world for us to start our drawing. Through the process of the drawing, we actually construct a space for the projected self. This space is a “subtle” one, yet all physical aspects of the space are not finalized. The space is also constructed in a rapid fashion, if
compared to the real construction process, freeing itself from linearity of the time, allowing for back and forth travels in the space while conceiving it. Free from restrictions of the material world (e.g. gravity), the constructed spaces initiate a playful world of subtle entities. As we construct spaces in our drawings, we also project our tiny “self” unto the drawing and inhabit the construction. From Francesco di Georgio’s personage, to Claude Bragdon’s Sindbad, to our own drawings, an architect’s drawing board has been the site of construction, inviting imaginary humans to inhabit them. With the establishment of a scalar relationship, another “self” at a tiny scale is projected onto the paper, an imaginal person in the drawings confessing to the in-between nature of the drawing.

It is also fair to say that a drawing is a girih, in its both senses of connection and commitment. It connects “self” to the miniature scale of the building on paper and to the future building, while obligated to invisible dream to be realized.
APPENDIX A.

VISUAL REPRESENTATION AND CULTURE IN THE ISLAMIC WORLD

Prior to studying geometry and geometrical drawings of the Islamic world—and especially their associations with the imaginal—a historical review of the visual and material culture of the Islamic world is needed. Indeed, certain themes and concepts suggest continuity across cultures and time, which can provide the reader with a deeper understanding of the subject at hand. Visual representation in the Islamic architectural tradition needs to be studied in tandem with the history of architecture in the Islamic world, in part because there are some essential differences in the conception of architecture from that of the West. I use the term “architecture” in the broadest sense to mean architectural practice, building materials and techniques, worldview of the culture, patronage, and more. For without a contextual study of these fundamental elements—which constitute a tradition distinguished and endowed with a unique identity—a comprehensive understanding of the many visual representations found in Islamic architecture would be neither possible nor meaningful. Despite internal geographical, temporal, and geographical varieties, visual culture in the pre-modern Islamic world (roughly between 10th-17th centuries) represents a relative cohesiveness in form and content.

The first specific architectural typology in Islamic culture can be seen in Quba mosque, which was based on the early Prophet’s mosque in Medina. In the earlier Medina mosque, one side of a rectilinear walled land was covered by palm tree trunks and leaves, constituting an open space (to be kept as courtyard) and a covered area for the prayer. There is no evidence or recorded information regarding the use of architectural drawing for this mosque. However, a later building, the great mosque of San’a (capital of Yemen) represents one of the first Islamic architectural projects. “According to early sources, the Prophet Muhammad commanded the construction of this mosque, including its location and dimensions, sometime around 630. While the validity of this claim lacks evidence and certainty, the mosque remains one of the first architectural projects in Islam. Sometime between 705 and
715, the Umayyid Caliph al-Walid I, rebuilt a new and larger mosque at the site.¹ While the attic space of the great mosque was under repair in 1972, parchments of Koranic manuscript were discovered. The manuscript dates roughly from the 8th century.² Fragments of the parchment include architectural drawings representing the great mosque of San’a in façade and in plan mode (Fig. A.1). However, due to controversy surrounding the truthfulness and/or potential misinterpretations of the ancient manuscript, very little research has been found regarding these architectural drawings, and in particular, their connection to that manuscript.³ These polychromic drawings demonstrate a high level of representational craft in execution, as seen in the depiction of the building, ornamentations, and landscape details. Islamic art and architecture historian, Oleg Grabar (1929-2011), argued for further research on these drawings and believed that these drawings can be studied on three levels: cultural, codicological, and perceptual. As he stated: “Until now only the first one has attracted any attention from historians of art.” ⁴

¹ Adopted from archnet.org online library: http://archnet.org/library/sites/one-site.jsp?site_id=7731
² Grabar, O. 1992. Grabar in The Mediation of Ornament indicates that the use of the 8th century for the date of creation of these drawings is uncertain.
³ A German Scholar, Gred Puin, studied the San’a manuscript and suggested that early Koran offered multiple interpretations. His argument is based on the fact that early Arabo-Islamic inscriptions and letterings did not include dots for letters; therefore, words and terms could have multiple meanings when dots change. He also argued that Koran’s language is that of early Arabs, and with the change of the word’s meanings through time, the correct interpretation is possible if one studies meanings of Koranic words in their ancient status. His studies, however, have been rejected by mainstream Islamic scholastics.
One could hardly conclude that whether these drawings are design drawings or post-construction representations to illuminate frontispieces of the Holy manuscript. This is due to two reasons: one that these drawings are understudied, and that there is not a strong evidence of the simultaneous use of plan and facades in later centuries, therefore, there is not enough of context to draw persuasive collusions on the use and purpose of these drawings.

In reviewing later historical materials, two modes of visual representations are common in depictions of the architecture of the Islamic world: geometric drawings (including interlocking patterns and plans), and miniature representations and paintings. The former, while sometimes including plans, are mostly design drawings—in contrast to the latter, which is visually close to the San’a drawings and are visual depictions or imaginative drawings of buildings. Unlike in the West, particularly during the post-Gothic era, plan or façade drawing conventions seem

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5 The representation style of the San’a drawings shows similarities with Egyptian style of portraying buildings and gardens. However, an in-depth study is required to discuss possible associations of San’a drawings and Egyptian representations. Hans Belting (2011) considers these drawings as representing only one mode: elevation, but I believe that the modular grid and the inner courtyard allow understanding the drawings as coexistence of plan and elevation.
not have been as commonly practiced in the Islamic world. This perspective is based on the rarity of extant plan and façade design drawings from pre-modern Islamic era. I suspect that some form of plans, even basic and non-elaborate, must have been available to the architect-engineer to have constructed anything. Later in the 17th century, evidence of grid plans on architects' drafting boards is reported, which will be discussed later.

It should be mentioned that façade-like representations exist in the miniature paintings and illuminations of the time. Al-Hariri, Arab poet of the 10th-11th centuries, authored the literary genre of rhymed prose, *Maqamat* (lit. assemblies), which was illustrated in the 13th century with semi façade-section illustrations of building fragments in a style of painting close to the San'a drawing. Such a style of representation eventually evolved into Islamic miniature paintings (with influences from China), reaching perfection during the 15th and 16th centuries—although they existed as early as the 12th and 13th centuries. Miniature drawing is semi-isometric in nature and allows a concurrent demonstration of various spatial planes, e.g. façade and plan or section and elevation—thereby facilitating a more imaginative depiction of the space. As presented in Fig. A.2., for example, the depiction of architectural space is in abstract form. Although suggesting the existence of two rooms (one for the children and the other probably for two teachers/masters), the spatial definition of the space (as we would expect today) is not transparent. A larger frame, as both tectonic frame and visual frame for the image, contains all the imagery. To the left is a column or wall of the masters’ room. Given the symmetrical nature of the room, one would expect that the right column of the room would be visually treated similarly—that is, the right column should be seen all the way to the floor. But we see that the lower part of right column (or wall) is screened by children. At least two children inhabit the space between the right column and the surface of the painting. Another example is the wooden deck of the masters; while depicted in a semi-perspectival front view (suggesting spatial depth), the legs, however, meet the horizontal plane. This interplay between surface and depth makes the drawing and the depicted exceed laws of material phenomenon. Both the space and the drawing lend themselves to the imagination of the viewer for further interpretation. Examples of such playful drawings in contemporary context is found in the works of
Dutch graphic designer Maurice Escher (1898-1972), who was influenced by the muqarnas structures of al-Hambra, Spain.


Miniature drawing, while offering a simultaneity of seeing various views (e.g., seeing inside, seeing outside, seeing elevation), is a form of spatial representation that does not rely on perspective. While depicted in semi-isometric view, the space does not follow the “normal” rules of the material world with respect to building or landscape form. Nasr concludes that the space of the miniature is that of the imaginal, as it offers colors, shapes, proportions yet not completely grounded in the sensible world.⁶ A miniature drawing of Maraq’a’s (a city in northwest Iran) observatory features similar portrayal of the space. While inhabited by individuals, the drawing escapes views normally seen by the corporeal eye; rather, it offers an imaginal eye

⁶ Richard Ettinghausen, Islamic historian, also mentions of similar notions as the principal of maximal representation.
through which one could see a multiplicity of things that might not be possible in the material world. One should be reminded, however, that these modes of representation were not popular among architects, and perhaps were not used as vehicles in designing buildings. However, these representations were used to depict buildings in more conceptual and ideal forms, thus transforming the building from the physical to the idea. This essentially is the imaginal function of the miniature painting that makes possible not only the move from idea to building, but the move from building to idea—as shown here in the case of the Maraqa observatory.

Fig. A.3. Miniature drawing (ca. 1410), Istanbul Universitesi Kutuphanesi, MS F. 1418, fol. IV. (from Necipoglu 1995). This drawing represents architectural space in semi-isometric and planar views. The drawing shows Nasir al-Din Tusi, polymath and promoter of the idea of mundus imaginalis, and his colleagues at Maraqa observatory. While the drawing provides some detailed information regarding the lattice windows, dome’s construction, and more, it is an imaginative depiction of the space as it exceeds the limitations of the sight.
This miniature shows Nasir al-Din Tusi, Persian polymath and one of the commentators of *mundus imaginalis*, sitting in the observatory of Maraqa with his colleagues, likely giving them lessons. The space of this miniature is that of *mundus imaginalis*; the relationship between inside and outside can be seen at two distinguishable instances: the large arched door/section demonstrating the inside of the building and the gardens behind the edifice. The painting suggests at least five concurrent views in modern representational terminology. First, a view parallel to the façade of the building: this view captures human figures, trees, and the arch of the façade in the conventional sense of elevation drawing. Second, a plan view that is best demonstrated in the rendering of the carpet, as if there was an eye inside of building looking down to the plan. Interestingly the human figures with their side view overlay the plan view of the carpet. Third, the view from the sky: this view captures the circular form of the dome construction and encompasses half of the concentric brick circles. Fourth, the partial view to what seems to be a well bucket, suggesting recognition of actual perspective (i.e., the human eye). Fifth, the ring of windows below the dome: this is an ideal depiction of the windows since all seem to be accurately proportioned. Whether my interpretation here accords to the intent of the painter who illustrated this drawing or not, it is still significant in that this drawing can be viewed imaginatively in various ways.

Although the use of façade drawings as instructional tools for buildings was not widely used, some extant plan drawings from the 15th to 18th centuries suggest that plan drawings were indeed used by the architects of that era. Unlike in the western world of the Renaissance, in which architectural treatises were colored by plans, elevations, and sections, plan drawings were not as common in the Islamic architectural tradition. We do have the example of the Ottoman’s use of simple plan drawings—also supported by written sources on the frequent use of plans and models in the Ottoman court—but these should not be considered as representative of most of the Islamic world (Fig. A.4).
Necipoglu’s study of extant plan drawing in the Topkapi museum suggests that some of those Ottoman drawings might be based on Western influences. These drawings are characterized by a dead (or blind) checkered grid incised on the surface of the paper. Plan proposals of a mausoleum from the 16th century are executed based on the checkered grid plan, these plans, according to Necipolgu’s studies “are superimposed on the grid, with the thickness of their walls filled in red watercolor” (Fig. A.5). The un-inked lines holding shadow without color and substance suggest the imaginal nature of the drawing when compared to the inked and colored lines.

Examples of plan drawings are also found in 18th century drawings of the Qajar period (1785-1925), during which plans were drawn on a checkered grid (with no scale) with little articulation of detail. The blind grids vary from 8 to 10 millimeters and are used as an underlined guide to execute the plan superimposed on it (see Part Two: Fig. 2.19).

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7 “Blind line” or “dead line” is a term used for un-inked lines incised onto paper by a pin tool. Use of these lines was popular in East and West by architects as to figure out the accurate layout or shape of the design on paper. Some of those lines were later “inked” to reveal the final drawing while some would remain un-inked as just served as process lines to determine final drawings. In the case of extant Ottoman plan drawings; a checked grid executed with blind lines was used as a guide to draw final inked lines of the plan. In Palladio’s drawings, which I observed some of them on display, blind lines were used as invisible sketches to find right proportions of facades, for example. Select number of Palladio’s drawings was on display at the National Building Museum, Washington DC in 2010.

The main unifying character of Islamic architectural drawing, however, is geometric pattern drawings, which dominated both architectural drawing and building at least since the 10th century (Fig. A.6). Understanding this mode of representation, which also alludes to a mode of thinking and making, is central to Part Two of this dissertation. The geometric mode of drawing (and to some extent the later tradition of grid-based plan drawings) and miniature painting—each coming from traditions that culturally, temporally, and geographically were diverse—became dominant modes of visual culture in which architecture was represented. A study of the context in which such visual traditions emerged and were embraced by Islamic architecture is revealing. For that, we need to briefly look at the context in which Islamic visual culture and architecture emerged, was nurtured, and reached its zenith in the 15th and 16th centuries.
There is little information available on the visual culture of the Islamic world at its inception and during its first two centuries. However, studies suggest that a major evolution which brought about a distinct visual identity did not occur until over two centuries later in the newly established Islamic capital, Baghdad.\(^9\) After the inception of Islam, Ummayad’s art and architecture—centralized around the current Syrian region, and whose representative buildings include the Dome of the Rock, Umayyad’s mosque, and the royal palaces of Khirbat al-Mafjar—dominated Islamic visual culture. Grabar considers Islamic visual arts under Umayyad’s (661-750) as secular culture.\(^10\) The architecture of the Muslim world seems to be an amalgam of Islamic traditions with Christian influences. Early mosques in Damascus, for example, which show sophisticated early Byzantine and Hellenistic influences in their ornaments, are identified with this period. Realistic figural representations are among the characteristics of the visual material of this period.\(^11\) Floor patterns and mosaics of Khirbat al-Mafjar, however, imply early emergence of arabesque (defined below), and to some extent, primitive patterns that suggest early (curvilinear and floral) forms of interlocking patterns (Fig. A.7).

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\(^10\) Grabar, O. 2005.

Well-articulated visual presentations demonstrating a unifying identity based on deliberate efforts are found after 9th and 10th centuries. What is known as so-called “arabesque,” an umbrella term for Islam’s visual culture, experienced a shift during that time. Necipoglu traces the emergence of the Islamic geometric mode to this era, the 10th century, and considers the early appearances of the geometric mode—namely, *girih* (Persian term meaning knot)—in the illuminations of the Koranic scripts (Fig. A.8).

Fig. A.7. Mosaic Ornament, Khirbat al-Mafjar, 8th century ?, Mosaic panel indicating ideas of interlocking pattern as knot in a more literal form. Source: Grabar, O. 1992: 115.

Fig. A.8. Left: Illuminated frontpiece of Ibn al-Bawwab Koran, Baghdad. colored inks with gold on paper, ca. 1000-1001 (Chester Beatty Library, Dublin, MS K.16. fol. 8r.), Source: Necipoglu, G. 1995. This illumination features one of the early appearances of the geometric mode of *girih*. Right: Illuminated end page of al-Bawwab Koran, Baghdad. colored inks with gold on paper, ca. 1000-100 (Dublin, Chester Beatty Library K.16. fol. 285r.), Source: Grabar, O. 2009. Signs of vegetal *girih* forms in curvilinear forms indicates that perhaps the geometric *girih* form derived from vegetal knot forms that existed in Umayyad’s time.
It was in Baghdad, the new capital of the Islamic world, that the Golden Age of Islam really began to flourish between the 10th and the 13th centuries. This was the time that the Caliphate established the *Dar al-Hikma* or *Bayt al-Hikma* (lit. House of Wisdom)—a multidisciplinary institution where theologians, scientists, and scholars deciphered and explored documents from other lands and across fields of sciences and philosophy. Importantly, scholars at this center translated Greek and Hellenistic treatises and books. After the fall of Rome, Alexandria became the new center for sciences and philosophy in the west, and intellectuals at the *Dar al-Hikma* embraced those teachings. Early Muslim philosophers such as al-Kindi studied the texts of Plato and Aristotle and other scholars and translated them into Arabic. This movement, which went well beyond translating and paraphrasing the hitherto knowledge of the West, played a vital role in developing and establishing the foundation of Islamic thought and culture. Prominent Islamic scientists and philosophers (e.g. Al-Kinidi, Alhazen), whose works reached beyond the Islamic world, flourished in this era.

It is under this climate that geometry was passed down to the artisans and architects as a sacramental means from the philosophy and sciences, enabling them to exercise those celestial canons in the material world. That is perhaps why the first appearances of geometric representations illuminate the pages of the Holy Scripture, suggesting these visual elaborations as means to mediations and spirituality.

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12 The tale of creation of Baghdad offers glimpses to persistence of imagination at that time. Baghdad, as the new capital for the Islamic world, was envisioned to be a perfect city; as such, its design featured a circle (the most perfect of forms) with the court at its center. When caliph asked to see a model of the new perfect city, the architect created a circle line of oil with the caliph standing at its center, and put the circle on fire. Then he explained to the caliph that you are standing at the center of the city and the file is the fortress protecting you. This tale tells us that perfect city’s model comprised of the caliph literary inhabiting it and the substance of fire, an airy (and imaginal) substance to visualize the future city.

13 Some historians believe that House of Wisdom was more of a movement than a physical center.
APPENDIX – B
GLOSSARY OF TERMS

Please note that terms are translated according to their meanings in the context of the present study.

A

_al-ahsan_ - best
_al-alam_ - world
_al-alam al-hissi_ (also called _mulk_) - sensible world, world of phenomena, natural world
_al-alam al-khayal_ – the world of imagination
_al-alim_ - knowing
_alif_ – first letter in Arabic and Persian languages
_al-khayal_ (also called _al-quwwa al-khayal_) – the faculty of imagination
_al-alam al-ghayb_ - the world of Mystery
_al-alam al-shahadat_ - the world of visibility
_al-alam al-mithal_ – the world of image, the world of imagination
_ansanaka_ - molded
_akhralata_ - mixed
_andaza_ - measure
_antajara_ - hewn
_antashsara_ - sawed
_ashyau ilahiyah_ – divine things
_al-aqd_ - knot, tie
_al-aqida_ - thought, opinion, dogma
_a’raq_ - transoms
_arkan_ - corners
_al-arwah al-bashariyah al-nuraniya_ - five luminous human spirits
_aroos_ – bride (Persian)
_asas_ - foundations
_asatin_ - pillars
_asfana_ - smoothed

B

_bagh_ – garden (Persian)
_bani_ - builder
_banna_ - builder
_al-bari’_ - the Producer
_batin_ – inner vision
_bayt al-hikmat_ (also called _dar al-hikmat_) - house of wisdom
_bi tariq al-badaya_ - a priori
_bina_ - building
_bind_ - firm building
_buyut_ – (plural of _bayt_) apartments, rooms


**C**

- *da’irat al-mumkinat* - circle of potential beings
- *darak* – small door (Persian)
- *dar al-hikmat* – house of wisdom
- *darib* - to fashion
- *dhat* - essence
- *dhawq* - taste
- *dhikr* - remembrance, mystics’ devotional act involving repetition of the Divine names

**D**

- *fa’il* - maker
- *alfaltaffa* - cohesive
- *falsafa* - philosophy
- *fann* - skill, how-to, also ‘knowledge’ in practical contexts
- *al-furqan* - that which differentiates, one of he names of Koran
- *al-futuhat* – openings, name of Ibn Arabi’s magnum opus

**E**

- *gardih* - powder
- *girih* – knot (Persian)
- *girih chini* – knot making
- *ghayb* - the Unseen, the invisible world
- *gulistan* – rosary (Persian)
- *guniya-i mistara* - angle-bracket ruler

**G**

- *al-handasa* - geometry
- *al-handasa al-hissiya* - sensible geometry
- *al-handasa al-aqliya* - intelligible geometry
- *al-hayy* - living
- *hayula* - in philosophical terms: ‘shapeless substance’ The term *hayula* is adopted from the Greek/Latin term *hyle*, and is particularly associated with the Aristotelian notion of matter, or cause of matter.
- *haykal* - body or mass (Persian)
- *hayat* - courtyard (Persian)
- *haytam* - walls
- *hijab* – veil, God’s veil
- *al-hiyyal* - deceptions
- *al-hyala* - deception
- *huduth* - the creation
al-husn - pure beauty
huwa/la huwa - He/not He

I

Ihya al-ulum – revival of sciences, one of al-Ghazali’s book titles
ijad - bringing into existence
ilm – science, knowledge
ilm al-khayal – science of imagination
ilm al-hiyal - science of deception
im'ani-nazar - scrutinizing gaze,
islimi - the spiraling ivy or vine and-tendril motif
irada - will
barzakh - isthmus
irfan nazari - theoretical mysticism or theosophy

J

jabarut (also called alam 'aqli) – world of archangelic Intelligences
jali – stone carved screened window
jami‘- gatherer
jawa’iz - beams
jism – body, thing, object
jism-i latif - subtle existence
jowhar - essence, ornate
judhu‘- joists

K

kakh – palace (Persian)
kar-bandi or rasmi-bandi – geometric patterns under domical structures
kashf - unveiling
katib - writer
katibah - inscription, epigraph
al-khaliq - the Creator
khat-i bannai - masonry calligraphy
khat-i ramz - secret line
al-khayal al-mutlaq - Nondelimited Imagination, Absolute Imagination
al-khayal al-munfasil - Dissociable Imagination, detached imagination
al-khayal al-muttaasil - Associable Imagination or Attached Imagination,
khitat – sectors
kitab – book
kitab al-manazir - Book on Optics, title of Ibn Haytham’s book
kitabah - writing
kumah - pile
ladhdha - pleasure
latif - gentle, sensitive, subtle
latih – patch, single frame openings of orosi window
libn - brick

malaka - habit, or in Ibn Sina’s sense: habitual reason
malakut – identical to al-alam al-khayal
ma’lumat - known things
ma’na - pure concepts
maqamat – assemblies, name al-Hariri’s book
mashrabiya – wooden screened bay window
mathal – similitudes, parables
Miftah al-Hasab - Key of the Arithmetic, name of al-Kashi’s book
mihraz – one who knows practicing geometry, architect (Persian)
mimar - architect
mimari - architecture
minbar - pulpit
miraj - Prophet Muhammad’s Night Journey
Mishkat al-Anwar - Niches of Lights, title of al-Ghazali’s book
al-mithal – image, example, exemplar
al-mithalat al-khayaliyah – similitudes, imaginalized similitudes
mihyl – ingenious, a person who knows how to practice hyla,
mudabbir – planner
al-mufakkirah or al-quwwah al-mufakkirah - thinking faculty, cogitative faculty
mughariz - grooves
muhandis – architect, one who knows geometry
muhadith - creator
muhit - circumference, surrounding
mujarrad – disengaged
mujid - able to bring things into existence
mukhtari' - inventor
al-mulk – identical with al-alam al-hissi
mundus imaginalis – the world of imagination (Latin)
al-Muqaddimah – the introduction, title of Ibn Khaldun’s book
muqaddir – designer, from taqdir: destiny
muqarnas – ornamental stalactite-like structures in Islamic architecture often found under domical structures
al-murid - willing
musawwir - painter
al-musawwir - the Form-giver
al-musawwira or al-quwwah al-musawwira - imaginative faculty,
al-mutakhayyilah or al-quwwah al-mutakhayyilah - imaginative faculty, Ibn Sina referred to it simply al-mutakhayyilah
**muzayyin** - adorner

**N**

**nada** - moist  
**nafs** - self  
**nafsani** - soulish  
**naqsh** – design  
**naqqash** - designer painter  
**naqqasha** - decorated  
**nuqush** - designs

**O**

**orosi** or **orsi** – wooden widow featuring interlocking pattern and colored glasses

**P**

**panjarah** – window (Persian)

**Q**

**q.d.r** - measure, number  
**q.I.b** - overturn, invert, change, transform  
**qaddara** - design  
**al-qadir** – the Powerful  
**qalb** - heart  
**qasr** - solid residence, palace  
**qawai’d** - footings  
**al-quran** - the Scripture, that which brings together  
**quwwa** or **quwwat** – power, faculty  
**al-quwwat al-hafiza** – memory, faculty/power of memory  
**al-quwwat al-khayal** - imaginative power  
**al-quwwat al-musawwariya** - form-giving faculty  
**al-quwwa al-mutasawwirah** - form-giving imagination

**R**

**ruh** - spirit  
**Risala Mimariya** – architectural treatise, title of a 17th century Ottoman architectural treatise

**S**

**s.w.r** or **swaawara** - to form, to paint, to fashion, to draw, to configure  
**sabiq** - advance  
**sa’i** - expert  
**safa’ih** - sheathing
san’at - art, artisanary, technique, (also see fann)
sani’ - fashioner
saqat - pillars
shah – king (Persian)
shah nishin – king’s seating, a room in the traditional Persian houses
son’ - making, made, root term for tasannu’ (artificial making).
al-sura - mental image
surah or sura – image, form
shahada - visible, visible world
sharaf al-sana‘i - loftiness of the crafts
shamsah or shamsa - sun (in geometric patterns), derived from al-shamsh (the sun)
al-sowar al-aqliya - Intellectual Forms
al-sowar al-hissiya - Sensible Forms
al-sowar al-mithaliya - the Imaginal Forms
sufi – Islamic mysticism
sufism – pertaining to sufi tradition

T

al-ta’ajjub - wonder
taballata - paved
tajassasa - plastered
takallasa - covered with lime, and mud (tasayya)
takhyil - imaginative creation, this is derived term from the root kh.y.l also meaning khayal
tamakkana - strengthened themselves
Tanqih al-Manazir - Revision of the Optics, name of a book by Kamal al-Din al-Farsi, an expanded translation and commentary on Ibn Haytham’s Optics
taqallub - fluctuation and transmutation
taqdir - design, proportion
tarbi’ - squareness
tasannu’ - artificial making
tashakkul - shape
taswir - form giving, drawing, painting, forming
tasawwur - imagining	
tavajjuh - orientation
al-tawajjuh al-ilahi - divine orientation
tawala - extended	
tazawiq - ornament
turanj – bergamont (in geometric patterns)
turab - earth

U

V

vajh – face, appearance
al-wahid al-kathir - the One/the Many
wajib al-wujud li-nafsihi - self-sufficient Being
wahm - a novel faculty of estimation

zahir - outer
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