RESEARCH PROGRAMS ON GEOMETRY AND ORNAMENT:
A Case Study of Islamicist Scholarship

by

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Bachelor of Architecture, American University of Beirut
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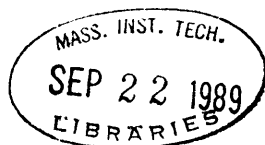August 11, 1989

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ABSTRACT

In recent years, increased effort has been expended in the definition of the role of Islam in the cultural production of art. Comparable endeavors have also been directed to the reduction of Islamic art, and ornament in particular, into mystical phenomena or, alternatively, to rationalistic and mathematical processes—pure geometry. Besides investigating these contemporary tendencies in a systematic manner, the purpose of this study is to place the arguments in their Islamicist revivalist context and to unravel their implicit references to the Orientalist discourse.

An introductory chapter deals with problems and issues of scholarship on Islamic art and ornament in general. The emphasis here is on the Orientalist background and on the process of Islamization of scholarship. The bulk of the thesis is based on a methodological distinction between three different scholarly interpretations of the forms and meanings of ornament in Islamic art and architecture: an external cultural position, an internal scientific approach, and an esoteric religious argument. The understanding of the role of geometry is highlighted throughout. Each of the three theoretical positions is taken at a time, and analyzed in terms of the scholars' perception, or possible misconceptions, regarding issues of symbolism, aesthetics, and the significance of geometry.

The critical method applied borrows from the differentiation of research programs in the epistemology of science. Every research approach, viewed as a hypothetically autonomous program, is synthesized in terms of its guarded irreplaceable core, its self-generated methodological rules and hypotheses, and its resistance to criticism. In the concluding synthesis, the three programs are dealt with as competing lines of thought, and are evaluated accordingly.

Thesis Supervisor: Stanford Anderson
Title: Professor of History and Architecture

ACKNOWLEDGEMENTS

iii

ILLUSTRATIONS CREDITS

Chapter I

Fig.1 Michael Darby, <u>The Islamic Perspective...,</u> 1983
Fig.2 Ibid.
Fig.3 Stuart Durant, <u>Ornament: From the Industrial Revolution to Today,</u> Woodstock-New York, 1986
Fig.4 Darby
Fig.5 Durant
Fig.6 Darby
Fig.7 Durant
Fig.8 Ibid.
Fig.9 Owen Jones, <u>The Grammar of Ornament,</u> London, 1856

Chapter II

Fig.1 O. Grabar, <u>The Formation of Islamic Art,</u> Yale University Press, New Haven and London, 1987
Fig.2 Ibid.
Fig.3 Ibid.
Fig.4 R. Ettinghausen, "The Character of Islamic Art", <u>The Arab Heritage,</u> ed. N. A. Faris, Princeton University Press, 1946
Fig.5 Ibid.
Fig.6 T. Allen, <u>Five Essays on Islamic Art,</u> 1988
Fig.7 Ibid.
Fig.8 T. Burckhardt, <u>Art of Islam: Language and Meaning,</u> World of Islam Festival, London, 1976
Fig.9 R. Ettinghausen and O. Grabar, <u>The Art and Architecture of Islam: 650-1250,</u> Penguin Books, 1987
Fig.10 L. Golombek. "The Function of Decoration...", <u>Theories and Principles ...,</u> ed. Margaret Sevcenko, AKPIA, 1988,
Fig.11 Ibid.
Fig.12 Ibid.

Fig.13 Ibid.
Fig.14 R. Ettinghausen and O. Grabar, <u>The Art and Architecture...</u>
Fig.15 Ibid.

Chapter III

Fig.1 R. Ettinghausen and O. Grabar, <u>The Art and Architecture...</u>
Fig.2 R, Ettinghausen, "The Character.."
Fig.3 I. El-Said & A. Parman. <u>Geometric Concepts in Islamic Art,</u> World of Islam Festival, London, 1976
Fig.4 Ibid.
Fig.5 N. Ardalan & L. Bakhtiar, <u>The sense of Unity...,</u> The University of Chicago Press, Chicago and London, 1975
Fig.6 L Bakhtiar, <u>Sufi Expressions of the Mystic Quest,</u> Thames and Hudson, London, 1976
Fig.7 Ibid.
Fig.8 Ibid.
Fig.9 Ibid.
Fig.10 Ibid.

Chapter IV

Fig.1 R. Ettinghausen, "The Taming of the Horror Vacui in Islamic Art", <u>Proceedings of the American Philosophical Society,</u> Vol. 123, No.1 (Feb. 1979)
Fig.2 Ibid.
Fig.3 Ibid.
Fig.4 Ibid.
Fig.5 T. Burckhardt, <u>Art of Islam...</u>
Fig.6 I. El-Said & A. Parman.
Fig.7 T. Burckhardt
Fig.8 T. Allen
Fig.9 T. Burckhardt
Fig.10 Ibid.
Fig.11 Ibid.

CONTENTS

INTRODUCTION

My INTEREST IN THE SUBJECT OF THIS STUDY STEMS FROM AN AWARENESS OF A SENSE OF confusion and occasional contradiction within the contemporary discourse on the ornamental art of the Muslim world. This confusion is related to two more general levels of concern: First there is the insisting question of the cultural vs. universal interpretation of an art that belongs to a particular culture in history, but which claims, at the same time, a trans-cultural character arguably acquired from the universal nature of the Islamic religion itself. This will ultimately lead to the second consequent concern about how to deal with this apparent dichotomy; be it in the use of the established criteria and methodologies of Western art, or by an alternative search from within the context of the Islamic tradition for a specifically Islamic approach.

The relative position of the scholarly approach vis a vis cultural boundaries raises the cross-cultural problem of the designation of the 'other'—the other culture or art—its reconstruction, and subsequent representation. This in turn brings forth the discussion of the Orientalist tradition and its methods of comprehending the art of Islam as an art of a "different" culture. Problems within Orientalist interpretations and representations were increasingly noted—especially after the end of the colonial period which strongly stood behind the established power of Orientalism. Reactionary approaches and alternative methods, however, were not able to obliterate the malignant effects of the Orientalist tendencies—now supported by a Western intellectual neo-colonialism—and were themselves a victim of a different kind of prejudice. These reactionary approaches of scholarship were strongly shaped by an Islamicist revivalist attitude which is still taking for granted the criteria of "otherness", established through the Orientalist cross-cultural referential system, as a basis for salvaging an endangered "Islamic identity" thought to be vanishing under the influence of westernization.

As part of its salvage paradigm, the Islamicist attitudes serve a growing demand for "abstracted" knowledge about an Islamic art which can easily be assimilated by the public at large. The consumer is now not confined to a Western clientele thirsty for exoticism, it rather extends to the Islamic world itself which is desperately seeking prescriptive statements about an Islamic past after having lost its battle with modernization. Within such a context, the main tendencies of contemporary research emphasized the role of Islam in the cultural production of the art of the Muslims. Comparable efforts have also been directed to the reduction of Islamic art, and ornament in particular, into mystical phenomena or, alternatively, to rationalistic and mathematical processes—pure geometry.

The main objective of this inquiry, therefore, is to analyze these contemporary tendencies in Islamic art research, and to explore their Islamicist revivalist character and their references to the global Orientalist discourse. Major issues which are bound to be raised have to do with the autonomy vs. cultural dependency of ornament and geometry; the question of the presence of symbolic and aesthetic systems that are specifically Islamic; the doctrine of unity. amd its use and abuse; the utilization of external history in research; and the validity of Western methodologies and theories when applied to research on Islamic cultures.

An introductory chapter deals with the historical development, methodological problems, and political agendas of Orientalist and contemporary research on Islamic art and ornament. The bulk of the essay is dedicated to a systematic study of this field of scholarship differentiating three hypothetical methodologies:

1- The cultural argument

The central objective in this scholarly approach is to respond to the question of why Islamic artistic endeavors were directed in a characteristic way "**different**" from that of Western art. The emphasis here, through the use of **historical** examples, is mostly on the search for different social and **cultural meanings** that are thought to have been attributed to the artistic forms.

2- The esoteric explanation

This approach deals with a particularly 'Islamic' art whose definition derives from a prescriptive system of **religious requirements** determined by the Quran, the Hadith and the Law. Theological and **mystical** principles are used, here, as interpretive tools. Symbolism is given an esoteric

dimension, and formal and structural order becomes a manifestation of the principle of "**unity**".

3- The rational/positivistic approach

Artistic production, here, is thought to be **independent of the cultural allegiances** and prescriptions of the faith, on the grounds that Islam itself is prescriptive in behavior and not in form. Efforts are directed, therefore, to the **internal formalistic** and purely aesthetic aspects of the art of making things, with the aim of exploring their generative principles and inherent processes.

The distinction between three research attitudes does *not* imply any sharp separation of autonomous categories of scholarly work. One or more scholars may appear to be in favor of one particular approach, yet, the identification of different research programs does not necessarily refer to a corresponding categorization of individuals or groups of scholars that exclusively follow one approach or the other. The distinction, therefore, is only made for **purely methodological purposes** .

In order to evaluate **competing** trends of thought about research related to a shared domain, one would need to utilize a **common methodology of assessment**. A useful assessment should possibly account for both the **external and internal history** of research, i.e. its motives and empirical constraints, as well as its internal logic of development.

As for the motives and external constraints, the analysis is directed to the **ideological shaping of the internal development of research** and its relationship to the external discourse on the culture of Islam. I will also try to attend to the selection or rejection of research topics on the basis of

ideological criteria, and to explore the driving power, the conscious or unconscious agendas, behind the competing programs.

As to the **internal criticism of the research approaches,** my work reflects a model from the field of epistemology of science where it was developed by Imre Lakatos for the analysis of scientific research programs. The model has already been tested in rational reconstructions of different types of theoretical and artifactual positions especially in the case of architectural research programs. It might be useful here to give a brief outline of the **Lakatosian model** and its understanding in the context of a research program:[1]

A scientific **research program** is considered as an alternative **methodological unit** in the understanding of the **growth** of scientific knowledge. The idea of a theory is replaced by a **series of theoretical states** that retain a common **hard core**. The hard core is a set of **conventional postulates** that are stable and unchangeable within one program. The hard core is self-maintained by yielding a set of heuristic methodological rules called: **negative heuristics**. These rules direct the program where **not** to go. They are behind the hard core's **resistance to criticism** because they are based on the **rejection** of theories inconsistent with the hard core.

The program also achieves direction through its operating rules: the **positive heuristics**. These direct the program through its development and contribute to the formation of new hypotheses. The **auxiliary hypotheses** allow for criticism and are open to **change**. They provide the hard core with a malleable **protective belt** which is ready to be adjusted or even replaced

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[1]In this brief summary, three main sources were utilized: Imre Lakatos, The Methodology of Scientific Research Programmes, 1978, Stanford Anderson, "Architectural Design as a System of Research Programmes" Design Studies. 1984, Roy Landau, "British Architecture. The Culture of Architecture: A Historiography of the Current Discourse:", UA International Architect 5 (1984) pp.6-9

according to negative experimental results. They maintain coherence between the hard core and the changing **empirical conditions.**

I would like to note, finally, that I am perfectly aware that a **synthetic or problem-oriented** approach, like the one I am following in this inquiry, is based on answering some **broad questions** that require partial information from **many sources**, and that this could easily lead to **superficiality.** The **necessary selectivity** of sources, scholars, and information can also be misleading. But, after all, these remain to be only means for the illustration of theoretical constructs and the realization of general objectives, rather than being ends in themselves.

DISCOURSE ON THE ART OF ISLAM

Outline

A-   ORIENTALISM AND ISLAMIC ART

   1   EARLY SYNTHETIC ENTERPRISES OF
      ISLAMIC ART
      a-   Origins and Approaches
      b-   An Outsiders' View of an Islamic Art and Culture

   2-   ORIENTALISTS AND ISLAMIC ORNAMENT:
      THE WORK OF OWEN JONES
      a-   Documentation and Imitation
      b-   The Search for Principles of a 'New Style'

**B-   CONTEMPORARY SCHOLARSHIP
      ON ISLAMIC ART**

   1-   THE PROBLEM OF GENERALIZATION
   2-   THE PAUCITY OF CONTEMPORARY MUSLIM
      WRITING ON ISLAMIC ART
   3-   THE ISLAMIZATION OF ART
      a-   Islam as an Explanation for Islamic Art
      b-   Commodification of Islamic Art
      c-   The Salvage Paradigm

S TARTING AS PART of a wider and much older interest in the Orient as such, research on the art and ornament of the Islamic East did not achieve an autonomous intellectual and academic status before the second half of the nineteenth century. The aim of this introductory chapter is to examine scholarly approaches since the early beginnings of Orientalism and trace their instilled effects on the more serious attempts of contemporary scholarship. The basic argument is that Orientalist research on Islamic art was based on a distorted and 'objectified' view of the East, and, more importantly, on a 'discourse of power' especially when it was associated with a concomitant European colonization of parts of the Islamic world. The other part of the argument claims that later and contemporary scholarship is still governed by a monopolizing post-colonial intellectual power which is manipulating research and educational approaches under the cover of Islamization and an authentic revival of a specifically Islamic art and culture.

A-   ORIENTALISM AND ISLAMIC ART

1-   EARLY SYNTHETIC ENTERPRISES OF ISLAMIC ART

a-   Origins and Approaches

S CHOLARLY INTEREST in the **archaeology** of the Near East began in the eighteenth century. Numismatics, epigraphy, and paleography were part of the earlier concern, and it is only at the end of the eighteenth century that we witness an awakening of interest in the artistic monuments of Islam, especially buildings. The first monumental work was the twenty volume *Description de l'Egypte*. Although published in 1809-1829, it goes back to the exhaustive and systematic surveys during Napoleon's invasion of Egypt in 1798. Apart from Egypt, interest was also directed, since the early nineteenth century; to Spain—and Alhambra in particular, while the first systematic work on the archaeology of the 'Holy Land' was carried out by Edward Robinson in Palestine in the 1840's. These scholarly investigations were translated into a multitude of publications which in turn aroused the curiosity of more artists, architects, and draughtsmen, who set out to the East towards the middle of the nineteenth century as we shall see in part (2).

A distinctive Orientalist approach to the study of Islamic art, formed in the first half of the nineteenth century, started with **collectors and philologists**. Reinaud, Coste, Dieulafoy, and, later, Max van Berchem were among the followers of this **"antiquarian-scholarly"** approach—as termed by Grabar. Central to this tradition was the knowledge of Oriental and Western languages or the passionate collecting of objects from all over the

Muslim world. It had an ambition of "making everything available", yet, it often tended to be descriptive and elitist[1]:

"There was an **elitist 'clubbism'** about this tradition, as there still is today among private collectors, 'Orientalist' scholars, and world travelers ... [it was also] very much aloof from the living culture of Islamic lands..."[2].

Another Orientalist approach to the study of Islamic art was rooted in **general Islamic studies.** Its followers, according to Ettinghausen, had a good background "in languages, literature, and history, but ... no training in the discernment of art forms".[3] **"Islamists"**—as termed by Grabar— also range from **text students** whose primary approach was textual rather than visual, to those who equally utilized visual and textual material. In the case of the first group, aesthetic and archaeological considerations were incidental to the main interest as for example with J. Schacht or in the works of L. Massignon and A. Schimmel on mysticism and the setting of Muslim culture. The second approach is thought to have originated with Max van Berchem and to be best exemplified in the work of Sauvaget and, later, J. and D. Sourdel. In this tradition, visually perceptible material and texts were considered equally necessary to the understanding of art history, and attempts were made to consider both closely bound together.[4]

Scholars who approached the available material mainly from an **"artistic point of view"** utilized historical facts including dates and names of donors and artists, which were provided by the 'students of texts', and channeled their research into categories of "style, iconography, and

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[1]Oleg Grabar, 'Islamic Art and Archaeology', The Study of the Middle East, ed. Leonard Binder, Wiley-Interscience, New York, 1976, see pp.232-233

[2]Ibid., p.233

[3]Richard Ettinghausen, "Islamic Art and Archaeology", Near Eastern Culture and Society, ed. T. Cuyler Young, Princeton N. J., 1951, pp.17-47 and plates. Cited in Islamic Art and Archaeology: Collected Papers, ed. Myrian Rosen-Ayalon, Berlin, see p.1243

[4]Grabar, 'Islamic Art and Archaeology'., pp. 239-240

technique".[5] Although they were well versed in style analysis, they brought with them "far greater enthusiasm for objects and monuments and their own interpretations of them, than familiarity with religious thought, literary documents, and historical data".[6] Pioneers in this group included Friedrich Sarre and Gaston Migeon whose *Manuel d'Art Musulman*, published in 1907, became "the prototype for several handbooks on Islamic Art by later scholars like E. Kuhnel (1925), and M. S. Dimand (1930).[7] The **art historical methodology** applied to Islamic art accepted methods of the history of art at large. Here, the scholarly attraction to Islamic art, as in the case of E. Baldwin Smith and Alois Riegl, was less motivated by exoticism than by a search in Islamic art for proof or exemplification of points or theories raised elsewhere in other periods of the arts. Although it claims a universal system of investigation away from exotic or parochial tendencies, this art-historical approach fails to realize "how much the **basic concepts of the history of art issue from a fundamentally European visual and intellectual tradition**", excluding thereby those who belong to the Near East and turning them into strangers within their own culture.[8]

Finally, both Ettinghausen and Grabar think that there was never enough cooperation between Islamists and art historians in the Orientalist study of Islamic art[9]:

> ".....the disparity of the two approaches often led to a mutual disregard and distrust between the two camps, which brought about a kind of split personality in the whole field".[10]

In order not to fall again in such limitations, they call for a **partnership between text-centered and monument-centered scholarship**; an

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[5]Ettinghausen, "Islamic Art and Archaeology", p.1236

[6]Ibid., p.1243

[7]Ibid., pp. 1236-1237

[8]Grabar, "Islamic Art and Archaeology", pp. 235-236

[9]See Ettinghausen, "Islamic Art and Archeology", pp.1244-1245, and Grabar, "Islamic Art and Archaeology", p.241

[10]Ettinghausen, "Islamic Art and Archaelogy"., p.1244

amalgamation of both disciplines where problems are solved in teams of social historians or historians of literature together with art historians or archaeologists. What ought to be achieved, they think, is a real balance between interest in the art object in itself—its visual and aesthetic appeal, and the wider cultural context—historical, social, and human—of that individual monument.

b-   An 'Outsiders' View of an Islamic Art and Culture

I T IS EVIDENT that Orientalist art research, of the nineteenth and early twentieth centuries in particular, has achieved considerable results especially on the level of surveys and **analytic** studies, at a time when a comparable local interest was almost missing. Such a realization is a common belief even for a critic of Orientalist scholarship like Al-Faruqi:

> "In the collection of art works, their [Western scholars] classification as to place of origin and period of production and systematization into art schools and styles—Western scholarship deserves the credit of great achievement..... There is no road to the serious study of Islamic art except through their works....."[11]

Commenting on the same issue, Ettinghausen also reminds us of the critical abilities of Western scholars. Ignoring the circumstances that accompanied their 'interest' in Islamic art[12], he feels proud of their free 'services' offered to the East:

> "...for the European and American student it is a source of great satisfaction that in this field of research **the West did pioneering work for the East**, and tried, for the first time, not only to collect all

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[11]Ismail Al-Faruqi, "Misconceptions of the Nature of Islamic Art", Islam and the Modern Age, Vol.1, No.1 (May 1970), p.29

[12]He nevertheless discusses such circumstances later in the same essay (see next note)

available historical and archaeological data, but also to evolve criteria with which to judge the works of the Muslim artists".[13]

This should lead us to reflect on the **causes and goals** of such Orientalist contribution, on the factors that facilitated the **realization of objectives**, and on the essential **weaknesses and prejudices** in the scholarly approaches.

The Romantic movement and its enthusiasm for early and distant cultures was definitely a major motivation for the increasing scholarly interest in the East. The Orient itself, and even the notion of an Islamic culture, were almost European inventions. Orientalism became "a style of thought based upon an ontological and epistemological distinction made between 'the Orient' and (most of the time) 'the Occident'"[14]. It was maintained "through dry and inhospitable grammars and furtively read travel accounts, romantic notions of faraway lands and exotic cultures"[15].

The rising trend in European scholarship, since the end of the 18th century, to discover the true architectural forms of the past, was not separate from a parallel interest in exotic buildings. This same period which relished Greek and Gothic revivals was also fascinated by an art which produced a 'dream-palace' like Alhambra: "a palace gilded by the spirits like a dream and filled with harmony"[16]. The architectural and ornamental styles of the Islamic world, became of particular interest for evoking picturesque and exotic moods, an issue on which I am going to elaborate in part (2).

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[13]Ettinghausen, "Islamic Art and Archaeology", p.1229

[14]Edward Said, Orientalism, Vintage Books, New York, 1979, p.2

[15]Grabar, "Reflections on the Study of Islamic Art", Muqarnas, Vol. 1, 1983,, p.2

[16]This is the motto of the folio publication by by Goury and Jones (Plans, Elevations, Sections and Details of the Alhambra, London, 1842-45), it is printed in large gold letters in the center of the frontpiece of volume I.

The conscious Orientalist effort of overcoming distances and cultural barriers made their knowledge of the 'other' cultures possible, but the distorted and romanticized view on which they based their intake limited the effectiveness of their knowledge to that of a biased outsider. Another factor which was even more limiting relates to the corporate institution designation of Orientalism—as "a western style for dominating, restructuring, and having authority over the Orient"[17]. Contributing to the formation of a 'discourse of power', the interpretation of the 'other' Oriental culture stemmed from a position of **dominance**, and was closely related to **imperialism and modern power politics in the Near East.** Edward Said remarks:

> "...most of what the West knew about the non-Western world it knew in the framework of **colonialism**; the European scholar therefore approached his subject from a general position of dominance, and what he said about this subject was said with little reference to what anyone but other European scholars had said. [.....] knowledge of Islam and Islamic peoples has generally proceeded not only from dominance and confrontation but also from **cultural antipathy.**"[18]

For knowledge of the dominated Orient and its cultural production to be easily assimilated and conveyed to a curious West, it had to be 'objectified' and abstracted from its historical and cultural idiosyncrasies. A common related belief was that of **fixity** or an unchanging rigidity of a frozen Orient. Going back to the enlightenment Eurocentric view of the world, the Orient was even **viewed as pre-history.** In order to convey knowledge about a non-historical art and culture, it was enough to transform generalizations out of personal, and most of the time biased, interpretations into attractively wrapped and easily accessible statements.[19] It seemed more convenient to

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[17]Said, Orientalism, p.3

[18]Said, Covering Islam: How the Media and the Experts Determine How We See the Rest of the World, Pantheon Books, New York, 1981, p.155

[19]The problems of generalization and commodification of knowledge about Islamic art persisted in later and contemporary scholarship as we are going to see in section (B).

spare any attempts of internal scholarly approaches from within the interpreted culture, and to **rely exclusively on judging Islamic art by the norms and standards of Western art** and Western aesthetics.

It is actually striking how much it is a West-centered view of what the arts ought to be that has colored the appreciation of Islamic art:

".... they fell upon the spirit of their own art (i.e. Western art) and, armed with that spirit as absolute norm of all art, they sought to bend Islamic art to its categories; and, when Islamic art naturally refused to be so bent, their misunderstanding of it deepened. The charge they imputed to Islamic art was always the same, namely, that it had **failed in that in which their Western art had excelled** and almost everyone repeated the charge."[20]

Western and Hindu artistic traditions emphasized so much the representation of the human form; thus Orientalist scholars stood, in utter bewilderment, before the absence of figures, drama, and naturalism in Islamic art. A tradition where they did not find something of Western art to which they could relate seemed to be one without true artistic concepts. This prevalent opinion of Islamic artistic creativity led to the **reduction** of Islamic art to surface ornament or artisanal techniques, or to its **relegation to a secondary position** in great artistic currents, and to considering it interesting only as a source of possible influences or as an exoticism.[21]

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[20]Al-Faruqi, "Misconceptions... ', p.29
[21]Grabar, "Islamic Art and Archaeology", see pp.242-43

2-   ORIENTALISTS AND ISLAMIC ORNAMENT:
THE WORK OF OWEN JONES

T HE WEST has long been intrigued by Islamic decoration. Since the Middle Ages, Islamic decorative ideas were so thoroughly absorbed that their presence has only been recognized comparatively recently.[22] Intricate arabesques became a favorite subject of the Renaissance artist[23]. More serious concern was given to decorative designs in relation to architecture when, during the eighteenth century, interest in the **architecture of the Islamic world** began to develop. **"Exoticism" and "the picturesque"**, however, were still primary objectives to be looked for in Islamic buildings, and were part of the contemporary romantic view of the "whimsical and charming" Near East, as revealed in the 18th century translations of the Arabian Nights.[24] One of the aims of the Rococo age was to stimulate "moods and associations by means of quasi-Oriental buildings and to create picturesque views especially in gardens"[25]. Around 1761, W. Chambers, included a Moorish structure and a mosque in Turkish style (Fig.1) in his design for the gardens and buildings of Kew in Surrey. Similar designs were also prepared by other architects for adorning country house parks. The main source for these designers was an English translation of J. B. Fischer von Erlach's _Entwurff einer historischen Architectur_ (1725)[26] where he wrote:

> "...the minarets are placed in the Plan by way of ornament to shew the true Taste of the Turkish buildings; and the Singularity of the Stile of Architecture is such that will render it a very pleasing Ornament, if executed in a Pleasure Ground..."[27]

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[22]Stuart Durant, Ornament: From the Industrial Revolution to Today, The Overlook Press, Woodstock-New York, 1986, p.139

[23]Ettinghausen, "Islamic Art and Archaeology" , p.1230

[24]See Michael Darby, The Islamic Perspective: An Aspect of British Architecture and Design in the 19th Century, World of Islam Festival Trust, 1983, pp.9-12

[25]Opcit., p.1233

[26]Opcit, p.10

[27]Cited in Darby, The Islamic Perspective...., pp.10-11

As Dalu Jones tells us[28], there has been a general tendency among Orientalist scholars "to dismiss all Islamic decoration as **stultifying** or as **excessive in its richness**". Many of them also attribute to Islamic art a hysterical over-decoration and an obsession with a compulsive *horror vacui*. Nonetheless, there were attractions in Islamic decoration, as compared to that of the West, among which were the **intricacy of detail and color, the tendency towards abstraction, and their possible appropriation in the search for new styles**, all of which I am going to discuss below while focusing on the unique contribution of one particular scholar—**Owen Jones**, who made serious attempts at rationalizing the otherwise assumed exotic quality of Islamic ornament.
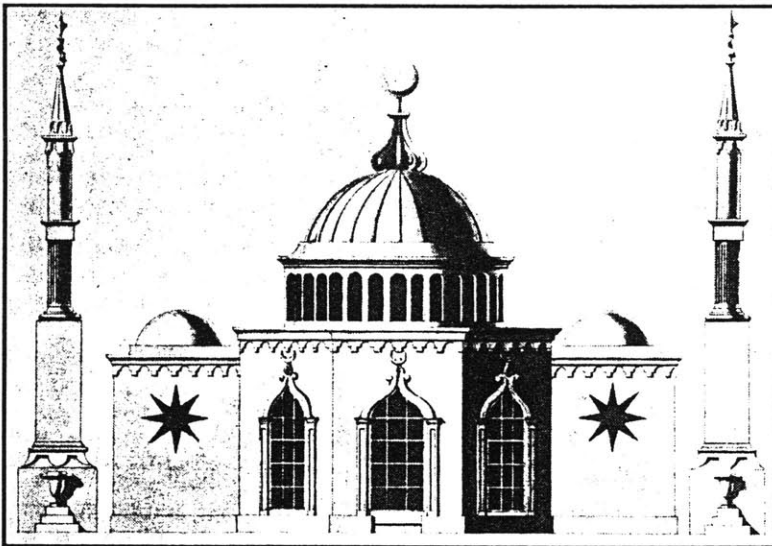
Fig.1: Design for a "mosque" in "Turkish Style", based on W. Chambers' Kew mosque of 1761

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[28]Dalu Jones, "Surface, Pattern and Light", Architecture of the Islamic World, ed.George Michell,, see p.175

a-   Documentation and Imitation

T RAVELLERS TO THE EAST, from Herbert (16th century) to the great Victorians, conveyed the image of an over-rich quality of Islamic decoration. They shared "a puritanical dislike for the decorative excesses of the East". Yet their fascination with the individual designs turned them into useful exotic subjects for copying and commercial display in Europe:

> "They contrasted the apparent rigor of European neo-Classicism, or the symbolic content of Gothic, with what appeared to be a clutter of different but always 'rich' materials and designs, **useful only when copied discreetly and used out of context in 'tasteful' interiors.**"[29]

Since the beginning of the nineteenth century, many young architects like Charles Barry and Pascal Coste, who were later to be considered among the leading architects of the Victorian period, set out to the Near East in pursuit of reputation at the outset of their careers. Their **careful observation and meticulous draughtsmanship were illustrated in extraordinarily detailed drawings** of Islamic monuments (Fig.2). The major theme to be revealed in the drawings was the emotive atmosphere evoked by the richness of decoration and the intricacy of the three-dimensional *muqarnas*.[30] The new concern was with the specific rather than the general whereby **documentation came to be seen, other than being in accord with the antiquarian enthusiasm of the age, as a ramification of the cult of the Picturesque.**

[29]Ibid.
[30]Darby, The Islamic Perspective..., see pp.24 and 26

Fig.2 : A drawing by Pascal Coste for his
Architecture Arabe, ou Monuments du
Kaire, Paris, 1837-9.
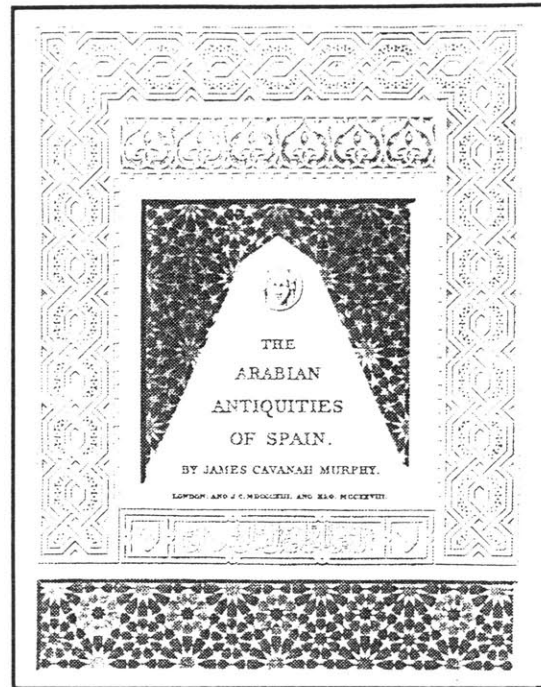
Fig.3: Title page of the Arabian
Antiquities of Spain by J. C.
Murphy,1813-16

Alhambra at Granada was among the first monuments to receive special attention. Apart from Durand's and Murphy's contributions[31] (fig.3),the most impressive study of Alhambra, by far, was Owen Jones' and Jules Goury's Plans, Elevations, Sections and details of the Alhambra, completed in 1845. Although the text contains lengthy **sentimental and descriptive contemplations** about the charming quality of the palace[32], it was not devoid, however, of **some rational interpretive attempts**. Jones

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[31]Durand's *Recueil et Parallèle des Edifices de tout genre*, and James Murphy's Arabian Antiquities of Spain, 1813

[32]Jones considered that the alcove of the Hall of the Two Sisters at Alhambra (fig.4) was the place "on which Poets, Painters and Architects of the day bestowed most of their attention. All the varieties of form and color which adorn the other portions of the palace have here been blended with a most happy effect. Its chief ornaments are the inscriptions which address themselves to the eye of the observer by the beautiful forms of the characters, exercise his intellect by the difficulty of deciphering their curious and complex involutions; and reward his imagination, when read, by the beauty of the sentiments they express, and the music of their composition." (Plans.....of the Alhambra, 1845)

appreciated the **fantastic quality** of the Alhambra's architecture and decoration, but did not only thrill to it; he sought to analyze it and understand it. The format of the book makes this point unmistakable: instead of being a set of picturesque views of the palace, Alhambra is a vast, orderly compendium of painstakingly accurate architectural and ornamental drawings (fig.5). It was presented in the way a major Western monument of architecture was to be dealt with, a mode which previously had not been applied to Islamic buildings.[33]
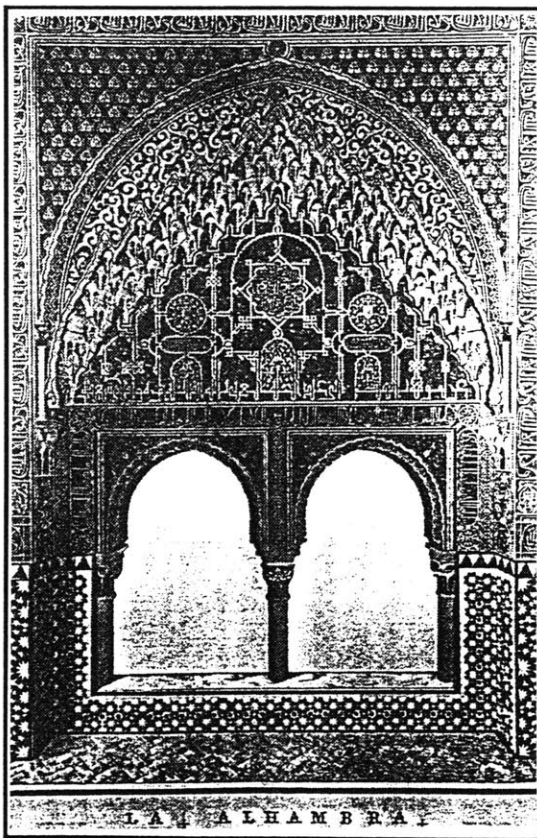
Fig. 4: Alcove of the Hall of the Two Sisters at Alhambra; from Plans....of the Alhambra by Owen Jones and Charles Goury
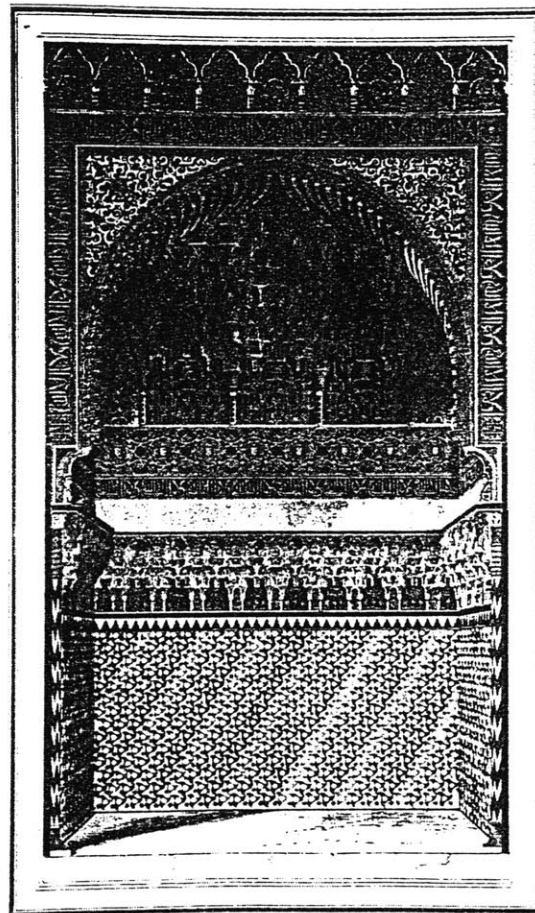
Fig.5: Detail from the Alhambra in Plans.....of the Alhambra by Owen Jones and Jules Goury

[33]David Van-Zanten, The Architectural Polychromy of the 1830's, New York, 1977, p.222

Meticulous copying opened the architects' eyes to the effects of **polychromy** which had been long ignored by classical teaching. The interest in color, as well, was part of "the context of the romantic movement as a whole, when polychromy also taxed the minds of artists, writers and scientists"[34]. The work of the first color enthusiasts was directed to classical buildings, and was still part of a general tendency to treat polychromy "as archaeological curiosity, or as an indication of barbarism during the Middle Ages"[35]. In the case of Islamic decoration, what many Orientalists advocated was not yet less subjective:

> "The Muslim artist, they reasoned, was a **color-hedonist** who naively stimulated a passion for empty, bright flashes of color, thus reducing the toil and ardor of geniuses over centuries to a mere *Reizfähigkeit* of some color-spoilt eccentries."[36]
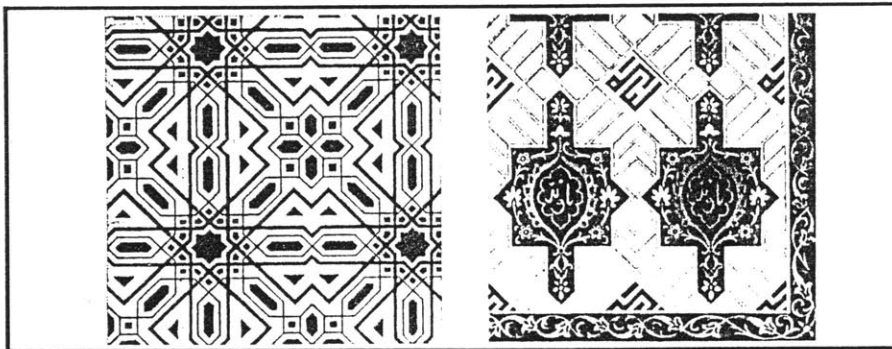
Fig.6: Details of ornament from Blue Mosque, Tabriz, by Charles Texier in his Description de l'Arménie, La Perse et La Mesopotamie, vol.1, Paris, 1842

More serious attempts, however, were later made at rationalizing Greek and Islamic polychromy. Jules Goury, Owen Jones, and Charles Texier, for example, did not simply note the different colors or thrill to them, they made painstaking studies of them which then had to be analyzed in detail in **search for principles that could help the reproduction of similar effects in contemporary works.**[37]

34Darby, The Islamic Perspective..., p.27

35Ibid., p.26

36Al-Faruqi, Tawhid: Its Implications for Thought and Life, The International Institute of Islamic Thought, 1982, p.237

37Ibid.

b-   The Search for Principles of a 'New Style'

I N THE SECOND HALF of the nineteenth century there was a major shift in Europe from ornamental imitations of natural forms based on a **metaphysical fascination with nature, to ornament as a practical science** which revolves around the **conventionalization of nature**. Nature was now no longer to be revered—but dissected and exploited. Although William Dyce (1806-64) and—to a lesser extent—A.W. Pugin (1812-52) were involved in the study of ornament as a kind of practical science (fig.7), it was Owen Jones who mastered the discipline. As an early student of Islamic design he was clearly influenced by its abstraction and denaturalization.[38] Naturalism for him, and other liberal reformers in design, became the approach to be most severely criticized for implying a three-dimensional illusion and a disregard for geometry inherent in the mind.[39] John Ruskin's ideas, on the other hand, were still rooted in the romantic visions of nature in the works of Wordsworth and Coleridge:

"He shrunk away in horror for the thought of conventionalizing nature. Nature was too holy to be subjected to such barbaric treatment, Absolute symmetry, regularity and uniformity—the essential characteristics of conventional design—represented not so much nature which had been idealized, but nature which had been treated like a machine." [40]
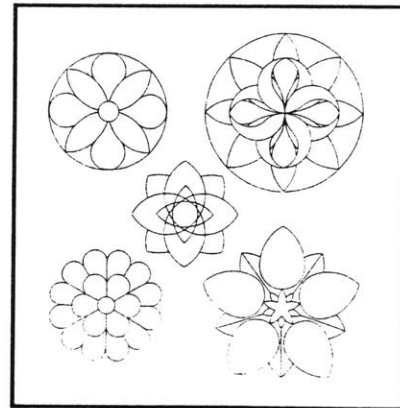
Fig 7: Geometrical exercises suuggesting floral forms, by William Dyce; in the Drawing Book of the Government School of Design, 1842-43

[38]Durant, Ornament: From the Industrial Revolution to Today, p.26
[39]K. Jespersen, Owen Jones' 'The Grammar of Ornament' of 1856: Field Theory in Victorian Design at the Mid-Century, Ph.D. dissertation, p.31
[40]Ibid., p.33

Ruskin saw in Islamic ornament an art which is mechanical and inhuman. In The Stones of Venice, he called the decoration of Alhambra "vile" and "detestable". He also criticized Indian art for being opposed to "all facts and forms of nature...", he looked at it as the outpouring of the imagination of a people capable of great cruelty.[41]

Although the increasing interest of the early nineteenth century in Islamic architecture and ornament can be related to the corresponding widening criticism of naturalism, it can also be viewed in the context of the global **revivalist movement** of the age. The two most committed revivalists of that period, Pugin and Ruskin, were eclectic within the constraints of the Medieval style. Jones' eclecticism, on the other hand, was of a wider scope; he could design in a large number of styles including, above all, the various oriental and Islamic styles. The ultimate aim of his eclecticism was the search for a **'new style'** of architecture and ornament that makes use of the **principles of the past** and can be easily **appropriated to its own age.** In his eclectic use of historical styles, therefore, Jones aimed at transcending the historical limitations which dictate style. His attempt, irrespective of its degree of success, was to arrive at an **'abstractive eclecticism'**, as compared to 'conservative eclecticism': rather than drawing on the conservative, repetitive and imitative tradition, his conventionalizing process was aimed at abstracting ornament and architectural style beyond the recognition of the original prototype.[42]

The Islamic ornamental style symbolized for Jones, and other liberal reformers in design, not only the pursuit of a conventional style of ornament, but rather a closer **alliance of the scientific and technological spirit with art.** And that is what became the founding official philosophy, in

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[41]John Ruskin, The Deteriorative power of Conventional art over nations, lecture at the South Kensington Museum, London, 1858

[42]K. Jespersen, Owen Jones' The Grammar..., pp. 44-45

the 1850's and 1860's, of the School of Design in London and the Department of Practical Art. **Positivism and utilitarianism,** became the dominant intellectual mode, and industrialization brought an ever-increasing demand for decoration. The creation of a new style was inevitable since science was to be the guiding force in the modern age, and since the **use of modern materials** was available through modern industry.

Jones was apparently seeking to evolve his new style of ornament through the study of Islamic designs. Although he started with what his critics referred to as "naive eclecticism", he came to realize that it was not the **forms** of Islamic decorations themselves which held the key to the development of a new style, but the **principles** which govern their design.[43] He was to conduct a more serious study of Moorish patterns. Rather than just expressing his fascination by their variety and infinite design possibilities, he attempted to explain their derivation from a series of **geometric grids**. His **rational analysis** was reflected in his mosaic designs of the 1840's, and particularly those included in Blashfield's book of 1842: Designs for Mosaic and Tessellated Pavements (Fig. 8).

Jones' interest in geometric abstraction appears at its peak in The Grammar of Ornament of 1856 (Fig.9). Among his 37 propositions, proposition 8 states: **"All ornament should be based upon a geometrical construction"**. That is, at the basis of the ornamental motif conventionalized from nature was the inherent schema of structure of the ornament, **the covert geometry**.

The Grammar, in general, summarizes Jones' contribution to the study of ornament. From the study of the principles of design which reign in **historical** ornament and the study of the laws which govern the flora and

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[43]Darby, The Islamic Perspective..., p. 101

fauna of **nature**, the designer could originate **principles of design** which would conform to the principles of the past and rationally account for the quality of **"repose"**, while still yielding an ornament **appropriate to its own age** or better suited for a new style. Jones' rationalistic approach to the study of ornament, and the Moorish designs in particular, had a long-lasting effect not only on ornament enthusiasts of his age, but also on any scholar who sought a rational interpretation of ornamental design to the present day.

Fig. 8: Mosaic design by Owen Jones in Blashfield's Designs for Mosaic and Tessellated Pavements, 1842
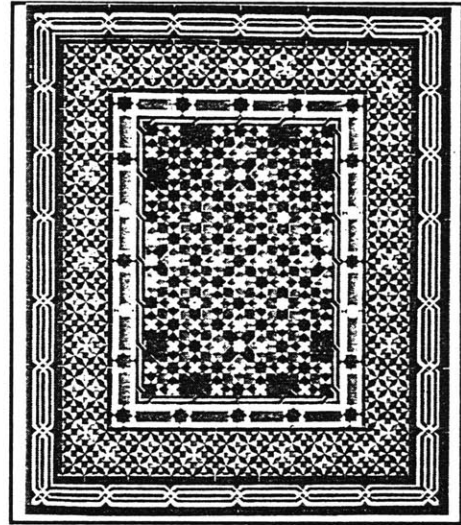
Fig. 9: A comparison between Arabian and Moresque styles by Owen Jones; in The Grammar of Ornament of 1856

Arabian.   Moresque.   Moresque.
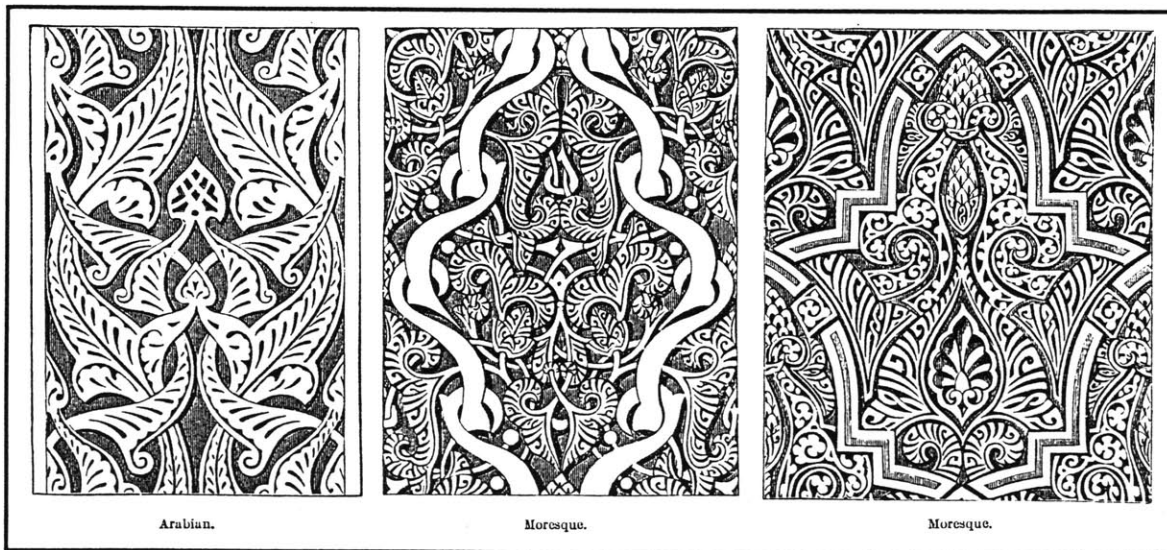
B- CONTEMPORARY SCHOLARSHIP ON ISLAMIC ART

T HE ORIGINS of twentieth century scholarship on Islamic art cannot be detached from Orientalism. Old Orientalist tendencies, now much-maligned, were still maintained and instilled through more archaeological surveys and excavations, and through enlarging artwork collections of ceramics, miniatures and rugs. Museums and academic centers in Europe and the U.S.A. later helped in the formation of a small group of **elitist essayists and scholars** who started, beginning a few decades ago, to have a distinguishable, and often **monopolizing**, role in writing and academia. Asking many of the same questions of Islamic art, some of them still insisted on the Orientalist tone. Others, out of a claimed worry about losing the "authentic Islamic identity", tried to reduce the study of the art of Muslims to questions of authenticity and Islamicness.

Since the early twentieth century, the methods to deal with research on Islamic art were made simple:

"...apply the methods of scholarship that had developed by 1900. A complex methodology that involved a complete bibliography, a survey of sources, and tripartite conclusions was required. The end product was *the book*, or at least an article with copious footnotes".[44]

It is not hard to question the ultimate value of this scholarship. Other than its being profoundly Western, the problem is its claim for **universality and exclusiveness**. It may have worked for the intellectual elite of the early 20th century, but its universal claim is "made obsolete, if not destroyed, by the national, social, technical, and linguistic changes that have come since then".[45]

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[44]Grabar, "Reflections on the Study of Islamic Art", <u>Muqarnas</u>, Vol. 1, 1983,, p.2
[45]Ibid.

With the advancing methods of storing and retrieving information, the situation would turn into an overflow of information and human input. Coupled with increasing barriers created by more national and regional boundaries, a need would arise for more **specialization and breaking down of the field of Islamic art**. Within the last few decades, scholarly work has actually been more specifically oriented to individual regions, historical periods or subject matters or techniques.

A few drawbacks of specialization, however, might have to do with the possibility of "overlooking certain cultural links among the various Muslim centers and the interchange of artistic ideas among the differnt craftsmen"[46]. Such diversification, moreover, although taken for granted in other scientific and artistic fields, still disappoints those who seek a more easily accessible knowledge of Islamic art grounded in generalizations[47]. They still agree with the traditional Orientalist view that finds it possible or even necessary to roam over vast spaces and chunks of time and to avoid overspecialization.[48] The problem of generalization will be discussed below; in addition to other problems that have to do with accessibility, commodification, obsession with revivalism, and the relationship of the Islamic faith to the arts and to the nature of the scholarly approach.

1-   THE PROBLEM OF GENERALIZATION

AMAZING IS THE NUMBER of studies (books, articles, ...) on Islamic art where the author would start by a few introductory remarks about the recognition of **common themes** within the rich palette of artistic expression and throughout the history of the discipline, and by asserting the **identifiability** of such art as a **unique** phenomenon that stands out and

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[46]Ettinghausen, "Islamic Art and Archaeology", p.1237
[47]See: Grabar, "Reflections...", pp.2-3
[48]Grabar, "Islamic Art and Archaeology", p.245

could be easily differentiated—thanks to its above common themes—from the rest of art over the world (meaning Western art). A useful means for making a case for Islamic art, as an independent field of study, separate from that of Western art, is to talk about it as a **single entity** and to make generalizations about its nature, intentions and characteristics.

Referring to common pitfalls of contemporary scholarship of Islamic art, Grabar finds "obvious **superficialities**" and "obfuscating **obscurantism**" to "have been frequent enough over the past decades, as several contradictory concerns, at times passions, have influenced the interpretation of an artistic tradition until recently restricted to a rarefied sect of Orientalists or to an equally uncommon band of wealthy collectors."[49] A major problem, he thinks, is the tendency of many scholars to seek **general and abstract meanings** in what could have been concrete and personal experiences, or to build abstract constructs, for which archaeological data exists only for a limited period in history, generalized from a few references and monuments. What Grabar finds dangerous here is that:

> "...unique cultural experiences can much too easily be transformed into meaningless and obvious generalities. The **opposite dangers** are either that a unique experience becomes **so specific** as to be unavailable for sharing and even explaining or that an artificial search for presumably universal values falsifies the truth of any individual's culture or experience".[50]

The **historical and geographical dimensions** of the problem are of prime importance. To the prevalent view of Islamic art, the Islamic world from Spain to Indonesia and from the seventh to the seventeenth centuries is a **monolith of aesthetic sameness**, and almost **anyone therefore can write**

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[49]Grabar, "Islamic Art: Art of a Culture or Art of a Faith?", p.1

[50]Grabar, "Symbols and Signs in Islamic Architecture", Architecture as Symbol and Self-Identity, The Aga Khan Awards, Philadelphia, 1980,, p. 1

about it.[51] But are not there dozens of exceptions to every generalization, and even if it is necessary to view the whole of Islamic art as one unit which is identifiable from earlier or surrounding contexts, shouldn't one consider that, like any other artistic tradition, it changed constantly and did not remain the same over the centuries? [52]

On the one hand, there is the Orientalist notion of the **"paradigmatic fossilization"**of a "frozen Orient" which is still affecting the study of Islamic art and its problems of fixity and generalization. On the other hand, however, one cannot disregard the argument about the uniqueness of Islamic art in that "it was less clearly divided according to ethnic and national lines than comparable traditions elsewhere, and that it exhibited few drastic formal and ideological revolutions comparable to the Italian renaissance or the 1860's in the art of the West."[53] The argument about a **lack in historical renaissances** could lead, nevertheless, to an emphasis on pre-Islamic origins and precedents and on the earliest designs at the expense of the operation of the whole artistic span.

2- THE PAUCITY OF CONTEMPORARY MUSLIM WRITING ON ISLAMIC ART

G EERTZ POINTS to an "oft-heard comment", on the part of many students of non-Western art:

"... that the people of such cultures don't talk, or not very much, about art- they just sculpt, sing, weave, or whatever, **silent** in their experience. What is meant is that **they don't talk about it the way the observer talks about it-or would like them to**-in terms of its formal properties, its symbolic content, its effective values, or its stylistic

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[51]Grabar, "Islamic Art and Archaeology", p.243
[52]Ibid., p.5
[53]Ibid.

features, except laconically, cryptically, and as though they had precious little hope of being understood".[54]

The paucity of contemporary Muslim writing on Islamic art is a fact always recognized and mentioned by western scholars. Ettinghausen, for example, considers that "this civilization [of the Muslim world] **never developed a critical system of artistic evaluation** and there are only occasional references to or descriptions of buildings and objects". Then he goes on:

> "It is true in more recent years Near Eastern scholars have become interested in questions of Muslim aesthetics, especially the religious implications, and they have lectured and written about it. Their suggested explanations of the phenomena have, however, not yet been convincing, especially to the non-Muslim Western mind, but it should be admitted there exists the possibility of religious connotations, although they still appear to be rather vague".[55]

Grabar, in his turn, admits that "we have no choice but to understand the Muslim tradition of art **from the outside...**" The reason for this, he thinks, is that the traditional as well as the contemporary Muslim cultures have not so far provided the kind of intellectual framework which helped make Chinese or Japanese art more accessible outside the culture itself. Yet he acknowledges the importance of contemporary Muslim contribution be it "meditations on Islamic art" or "more practical investigations into the psychological and emotional attitudes of the modern Near East toward its own visual expression".[56]

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[54]Clifford Geertz, Local Knowledge, 1983, p.97

[55]Ettinghausen, "The Taming of the Horror Vacui in Islamic Art", Proceedings of the American Philosophical Society, Vol. 123, No.1 (Feb. 1979), p.18

[56]Grabar, "What Makes Islamic Art Islamic", Art and Archeology Research Papers, No. 9, 1976, p. 1

Grabar also acknowledges a particular **"local" point of view** towards the study of Islamic art. Although it was affected by nationalism and "the emergence of real or artificial nations all over the Muslim world", yet it involved Muslims in the understanding of their own art. It flourished in local universities, got involved with collectors and the art market, and produced a lot of bulletins, annuals, and annals. This tradition, however, could often become "dully descriptive" or "ridiculously **nationalist-parochial**"; "its passion is not always matched by equal intellectual abilities"[57]. Being local and classified under *national heritage,* it won the blessings of the new governments; but in this itself it was handicapped by the political realities in the Muslim world and the lack of funds and training:

> "[Another] weakness has been national compartmentalization, often
> of a ridiculous nature when combined with linguistic antagonisms.
> Books and knowledge do not move easily from Syria to Iraq, from
> Iran to Afghanistan, or from Soviet Central Asia to Iran."[58]

It is true that the Muslim world did not participate sufficiently in the development of the contemporary scholarly techniques of studying Islamic art. This fact, however, should be understandable when we realize that the available techniques are profoundly Western and claim **"exclusivity, as the standard-bearer for scholarship and thought"**[59]. Muslim scholars who went along with such research techniques are often falling in the dilemma of Islam, or Islamic art, representing itself through **prescribed stereotypes** to which it was associated within the Orientalist scholarship. Those who did not follow blindly, or did not have the chance to, are not yet able to develop alternative techniques from inside the culture. But the question is whether the reason is incapability or an imposed disability to compete with

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[57]Grabar, "Islamic Art and Archaeology", see pp.233-235

[58]Ibid., p.234

[59]Grabar, "Reflections...", p.2

a **dominating intellectual power** of exclusion and silencing prevalent even within the post-colonial roles of the West.

The Western intellectual monopoly in the Muslim world, especially in education, created for many decades a public lack of interest in Islamic art and monuments—save the concern of a few highly educated and Westernized people. To understand the depth of the problem, one should only look at the limited significance given to the visual world in education and history books, to the Western **monopoly of the educational positions** for Western or Islamic art—if any—in most universities of the Islamic countries[60], and to the **limited accessibility** to the written and visual material in the richest and largest libraries of the world.

To what extent can a culture, or an art of a culture, be meaningfully understood by applying techniques developed outside it? The issue here relates specifically to both Muslims and non-Muslims studying Islamic art. One may argue that non-Muslims are not equipped to "supply the precepts that derive from membership in a Muslim culture"[61], but what about Muslims who are trying to utilize prescribed external techniques, and would their findings necessarily fall into the limitations of their means? A possible answer might have to do with the degree of consciousness of the scholar as to the risk involved in the use of non-Muslim techniques and methodologies, which makes it perfectly understandable to apply such means provided one is aware of its pitfalls. One may also support this by arguing, outside a Western culture-bound view of Islam, that it is always permissible to utilize methods and achievements of other cultures and to accommodate them within the all-encompassing nature of Islam.

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[60]See Grabar, "Islamic Art and Archaeology", p.242
[61]Opcit., p.3

3- THE ISLAMIZATION OF ART

a-   Islam as an Explanation for Islamic Art

QUESTIONING THE ISLAMICNESS of Islamic art has become trendy in the last few decades. It is worthwhile, nevertheless, to ask whether **the need to define an Islamic art** was an Orientalist one in the first place, and came as a result of an outsider's view of a foreign culture:

> "Ironically the idea of the "Islamicness" of Islamic art has been picked up by Muslims unaware of how deeply rooted it is in a highly culture-bound Western view of the East".[62]

It is true, moreover, that the reason behind differentiating a category of Islamic art is to hint, in many cases at least, to the relationship between the faith and artistic creativity, but it could also be argued that since we do not know of any such attempt in Medieval Islam, then the reason could have simply been a modern need to **differentiate the art of Muslims from other sacred arts.:**

> "It is even possible that the scholarly treatment of Islamic art as "Islamic" consciously parallels the interpretation of early Christian art as "a new spiritual art".[63]

The **"Islamic" label**, in any case, has become a fashionable addition to art, architecture, and other cultural productions of the Islamic world. In this very inquiry, I have always thought twice every time I used the term in relation to ornament, art, or culture. It was hard, however, to think of a simpler or more practical term that might be as easily accessible to the reader. The risk which is actually involved is that the abuse of the term could easily lend itself to an affordable commodification of the art, its

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[62]Terry Allen, <u>Five Essays on Islamic Art,</u>, p.2
[63]Ibid., p.2

possible reduction to a rare art of a past tradition, and its association with an easily revivable phenomenon. And when it comes to the culture as a whole, one difficulty about the **notion of an 'Islamic culture'** is that the expression "tends to be seen in terms of so-called primitive cultures, as it sometimes is in anthropology, or of some particular, real or presumed 'religious culture', such as Christianity."[64]

The **relationship between Islamic art and the Islamic faith** remains the primary objective of the present discussion. There is first the increasingly growing view that refuses to accept a separation between a **religious** and a **secular** art or architecture (S. H. Nasr, N. Ardalan, G. Haidar):

> "...the **unitary** point of view so emphasized in Islam leaves nothing outside its scope and refuses to recognize a legitimate domain of the purely secular or profane in contrast with the sacred..."[65]

A second view accepts the above arguments only in the case of traditional Islamic art, before the contemporary advents of secularism and Westernization[66].

Grabar proposes an interesting alternative for the traditional secular-religious dichotomy. The "Islamic" categories, he thinks, should rather lie in a **public-private contrast determined by the degree of accessibility of art objects to people** and not according to religious or secular use.. The public realm is thought to prefer **"generalized** forms with concrete meanings", whereas the private realm could deal with the **specific**, rather unununderstandable, iconographic references of the visual art.[67]

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[64]Muhsin Mahdi, "Islamic Philosophy and the Fine Arts", Architecture as Symbol and Self-Identity, The Aga Khan Awards, Philadelphia, 1980, p.43

[65]S. H. Nasr, "Foreword", The Sense of Unity, Ardalan and Bakhtiar, p.xii

[66]See Dogan Kuban, "Prepared Commentary", Toward an Architecture in the Spirit of Islam, The Aga Khan Awards, 1980, pp.6-10

[67]Grabar, "Islamic Art: Art of a Culture...", p.4

One traditional view of the relevance of Islam to Islamic art is the Orientalist-based notion that Islam itself restricted artistic activities and was even adverse to art as such. Islam's **prohibition** of human representation is thought to have limited the Muslims' artistic creativity or even affected the artistic taste of the whole society. Herzfeld considered that "the Muslim outlook on life, as contrasted with that of classical antiquity and even of Christianity, left, strictly speaking, no room at all for art on a large scale"[68]. Another example is the populist argument formulated by Marshall Hudgson about two decades ago which asserted "that the urban and populist culture of Muslim cities created **a social taste which was "avisual" and in many ways opposed to art itself.**"[69]

Whatever misconceptions these and other constructs may hold, the more common belief remains that it was indeed the faith in its manifested expressions that was the consistent **inspiration and control** of artistic creativity—especially in the golden age of Islam—and which shaped to a certain extent many aspects of Islamic art including denaturalization and the pursuit of the Divine presence rather than ecclesiastical or imperial power. What remains is the intellectual possibility of distinction between different **levels of understanding the role of the faith** in the inspiration and control of the art of Islam. Is it, as Grabar puts it, a distinction between "a high level **rational piety** in the superb abstraction of geometry", "a more **popular folk piety**", and "**mystical thought**"?[70] And the other inevitable question relates to **what kind of scholars** are we expecting to research the possible equivalences between different theological positions and artistic subjects and tendencies, and consequently verse themselves in Islamic theology. This eventually leads us to raise the distinction between the kinds of scholarship that may originate from within the world view of Islam or

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68Herzfeld, Encyclopedia of Islam, s.v. Arabesque
69Opcit., p.3
70Ibid., pp.3-4

otherwise from outside the faith, and, therefore, the question of Muslim vs. non-Muslim scholars, or even religious vs. secularized Muslim scholars.

b-   Commodification of Islamic Art

R EASONS for the contemporary increasing interest in Islamic art can be related to two levels of concern. The first has to do with a continuing interest in the "**internal**" history aspects of the discipline with the purpose of identifying characteristics that might be responsible for its internal unity. The second fails to avoid the contemporary widespread aspect of commodification of knowledge. It is directed towards concerns **external** to the discipline of Islamic art as such, and more related to increasing academic and public needs for "**consuming**" **simplified and easily accessible information** about the art of a culture of a vast geographical and historical span. It is not easy, however, to limit oneself to the first internal level for it is hardly possible to write on Islamic art, or any other art for that matter, and disregard the writers' and readers' needs, expectations and affiliations.

It is easy to observe, therefore, within contemporary scholarly work on Islamic art, a conscious intention to stand up for the expectations of people inside and outside the academic circles. But within the attempt to make the work as meaningful as possible to **contemporary discourse**, there is the risk of falling into **labeling and categorization**, of the issues raised about Islamic art and the nature of questions asked of it, into predetermined models and methodological expertise developed in discourses on the art of Western or even "primitive" cultures.

Another equally important problem is the need, of Western as well as Muslim scholars and practitioners, to comply with the expectations of

contemporary architectural and artistic **patronage**. This issue has to do with the important post-colonial role played by some Muslim countries when it comes to the investment of a tremendous new wealth—especially of the oil producing nations—in extensive grants for research and major exhibitions, and in grand architectural commissions—including ornamental schemes. One thing to consider here is that **the availability of extensive funds**[71] could easily lead to a competitive market-like situation in intellectual scholarship as well as practice. Patrons and decision-makers demand easily available knowledge about the Islamic past. In practice, they need to link to it aesthetically, and, therefore, expect the historians to look for hasty answers, within the past, about the essence of Islamicity of a form, a motif, or a structure. This may lead the historian to fall into simplifications or generalizations, and to look at the past through the ideologies of the present.[72]

Finally, the investment in **exhibitions and major publications** may induce **inflection points** in the study of Islamic art (or any other artistic tradition for that matter). Any major exhibition[73] might suddenly channel scholarly activities and the subsequent critical discourse into specific directions or increase the publications on some particular sub-field of Islamic art. The amounts and sources of funding for such events, and their accomplishment in international exhibition centers and publishing houses, away from the regional Islamic context, might bring to mind the possibility of having some "expressed or implied objectives" which may reflect certain

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[71]Especially in the case of the Aga Khan funds for education, research, and architectural awards.

[72]See: Grabar, "Reflections...", p.3

[73]As examples of such exhibitions Grabar cites in ibid. the 1910 Munich exhibition, the 1931 exhibition of Persian painting in London, the Leningrad congress and exhibition of 1936, the Paris shows of 1938 and 1971, and, last but not least, the Festival of Islam held all over Britain but most particularly in London during the spring and summer of 1976.

prejudices and provide "willful or accidental, immediate or slow burning, directions" shaping the continuing discourse on the art of Islam[74].

c-   The Salvage Paradigm

T HE CALL FOR THE **REVIVAL** of Islamic art and architecture goes back to the colonial era of the late nineteenth century and the first half of the twentieth century when much of the Muslim world was dominated by the West. During that period, "north Africa, Egypt, Iran and India witnessed a much more strongly articulated concern for the **preservation**, continuation, and re-adaptation of **traditional** styles of architecture and folk art than was called for during the forties, fifties, and sixties of this century".[75] These decades which witnessed political instability and the emergence of socialist regimes in the Middle East, gave less importance to Islamic or even national or ethnic definitions of the arts in favor of social attributions and modernistic aspirations. But in the last few decades, **ethnic and national considerations** are seemingly playing an increasingly important role. There are the attempts of Arabist scholars to define Arab art and architecture, Turkish scholars looking for Turkish motifs and concepts in what was the Ottoman Empire, similar projects by Imperial Iran, and ethnically and regionally based research in the Soviet Union. In most of these efforts, however, the **"Islamic"** consideration is thought to be over and above the regional, ethnic, national, and climatic variables. And any attempt, therefore, to restore national or regional identity is linked to **salvaging the "authenticity" of an Islamic past.**

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[74]Grabar, "Geometry and Ideology: The Festival of Islam and the Study of Islamic Art", A Way Prepared: Essays on Islamic Culture in Honor of Richard Bayly Winder, ed. Farhad Kazemi and R. D. McChesney, New York University Press, 19 , pp.145-147

[75]Grabar, "Reflections...", p.3

The **'salvage paradigm'** started as a colonial policy mostly apparent in urban planning schemes—especially in the building of new colonial cities while preserving the isolated old *medinas* for obvious strategic reasons. Later, through its instilled intellectual and academic presence, the post-colonial West played an important role in transforming the increasing anti-Western **and anti-Modernistic** feelings into **nostalgic** attitudes that often led to a regressive kind of **traditionalism** disguised as an Islamicist revival or a search for **cultural identity**.

The nostalgia for an idealized Islamic past was reflected in architectural research and production. But what is most relevant to our purposes here, is the effect of the 'salvage paradigm' on the **revival of ornamental art**, and the political agendas behind official endorsements of rehabilitation of traditional crafts. In the last few decades, there has been an increasing application of **grand ornamental schemes** to carefully selected architectural projects by a distinctive group of patrons. Among these are royal and presidential palaces (especially in the Gulf countries and Morocco), governmental complexes, state mosques (Kuwait State Mosque, for example, where imported Moroccan artisans were utilized), royal mausoleums (as in the case of the Mausoleum of the Moroccan king Muhammad V ordered by King Hassan II), and the renovation of a variety of selected traditional buildings (especially in Morocco under the supervision of André Paccard).

What I want to arrive at finally, is that this trend of applying generous ornamental schemes created a growing need for a particular type of research that would dedicate itself to surveying as many historical ornamental patterns as possible, and which should deal with their design processes in order to facilitate their copying and at best their regeneration. This has resulted in a number of different publications ranging from more

serious works on design principles and processes, to manuals and pure surveys. A very well known example is André Paccard's: <u>Traditional Islamic Crafts in Moroccan Architecture</u>, whose two large and handsome volumes are collector's items among privileged students in the Islamic world and in architectural offices, especially those involved in architectural commissions in the wealthy Arab countries.

GEOMETRY AND ORNAMENT
THE CULTURAL ARGUMENT

Outline

A- GEOMETRY AND ORNAMENT AS PRODUCTS OF A 'DIFFERENT' CULTURE

   1- ORNAMENTALIZATION AND ABSTRACTIVE TENDENCIES
   2- FEAR OF EMPTY SPACE: *HORROR VACUI*
   3- THE ORIENTALIST THEME OF THE ARABESQUE

B- CULTURAL (AND SPECIFICALLY ISLAMIC) MEANINGS IN ORNAMENTAL ART

   1- IS THE QUESTION OF GEOMETRY CULTURALLY BOUND?
   2- SYMBOLIC MEANINGS AND FUNCTIONS ATTACHED TO ORNAMENTAL DESIGNS
   3- AMBIGUITY VS. SPECIFICITY OF MEANING

C- ON THE INTELLECTUAL AND SOCIAL STATUS OF ORNAMENTAL ART

D- SYNTHESIS

T HIS CHAPTER considers one particular type of question raised in contemporary research on ornament as part of the larger context of Islamic art. **"To what extent should art objects be given a cultural significance"**, and what kinds of interpretation are given **in the case of the Islamic culture in particular?** In other words, how far has one to pursue **meanings behind forms** and explore their possible origin in the Islamic culture? I will address a number of issues relevant to these questions, and which relate to socio-cultural explanations given for the **nature and purpose of ornament, its production, and its peculiar reliance on geometry.** Richard Ettinghausen, Oleg Grabar and Terry Allen are among the major contemporary scholars to whose works I will refer.

I begin with cultural interpretations, and misinterpretations, of issues related to ornamental designs as belonging to a particular Oriental/Islamic culture. The second part addresses the issue of meaning in geometry and ornament of the Islamic world, and explores different hypotheses regarding the cultural vs. the universal nature of the problem. The third part discusses the available research on the social and intellectual status of ornamental art in medieval Islam.

A-   GEOMETRY AND ORNAMENT AS PRODUCTS OF A 'DIFFERENT' CULTURE

1-   ORNAMENTALIZATION AND ABSTRACTIVE TENDENCIES

AVOIDANCE OF NATURALISM and preference for ornamentation, stylization and limitlessness are always thought to be major common characteristics of Islamic art, and to contribute, at the same time, to its uniqueness as specifically Islamic. My effort here will be directed to examining scholarly interpretations of the **abstractive and geometrizing tendencies** in Islamic ornament. My main concern is the scholars' responses to the question of why such abstract geometric designs were used abundantly, and to their suggested cultural and psychological explanations.

It has become commonplace to raise issues related to the **central role of ornamentation** in early Islam—only assumed to be so central when compared to its use in Western art. "Ideologically, old notions of iconoclasm and ornament predominate and still percolate into the manuals and surveys that form the taste of the educated public."[1] Such notions go back to Orientalist contributions to the field whereby the failure of Islam to produce a figurative art is considered to be the problem *par excellence*. Herzfeld, for example, thinks that ".....the development of ornamental decoration, as exhibited in the arabesque, was favoured by the prejudice against the large forms of art in general....."[2] He also finds in the non-figurative and geometrizing tendencies an untruth to nature or "direct opposition" to it.[3] M. S. Dimand asserts that the fact that the "representation of figures and animals ... are always subordinated to the prevailing decorative tendencies"

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[1]Oleg Grabar, "Reflections on the Study of Islamic Art", Muqarnas, Vol. 1, 1983, p.4
[2]Herzfeld, Encyclopedia of Islam,s.v. Arabesque
[3]ibid

is behind Islamic art being "essentially one of decoration".[4] And finally, T. W. Arnold, falling again in the same trap of judging Islamic art with the standards of its Western counterpart, feels disappointed with the figurative representation of the Muslim artist (especially in the art of the miniature):

"[the artist] was apparently willing to spend hours of work upon the delicate veining of the leaves of a plane-tree or the shades of color on the petals of an iris, but it does not seem to have occurred to him to devote the same pains and effort upon the countenances of his human figures and make them show by their expressions their mental attitude towards the scene in which they are playing a part."[5]

Contemporary Islamicists, in their turn, find it unavoidable to address the same old issue of explaining the unique role of ornamentation in Islamic art. Discussing such role, Grabar remarks:

"One could argue that, as Islam imposed upon itself a number of limitations on the iconographically significant, it simply concentrated its energies on the ornamental. The redundant[6] [from the position of Western art] became the main subject of an artistic tradition and, as the tradition grew and developed, its every new motif, even inscriptions, was ornamentalized".[7]

Concentrating on the ornamental, and avoiding literal representation, raises the central question of the inherent process of **abstraction** and its primary reliance on geometry. In an attempt to explore possible answers, Grabar proposes a few abstract principles to which vegetal, geometric or other ornamental designs are thought to have been subordinated (figures 1

[4]M. S. Dimand, A Handbook of Mohammedan Decorative Arts, Metropolitan Museum of Art, New York, 1930

[5]T.W. Arnold, Painting in Islam: A Study of the Place of Pictorial Art in Muslim Culture, Clarendon Press, Oxford, 1928

[6]By using this term, Grabar is referring to ornamental motifs of classical capitals which are "essentially redundant in the sense given to the word by linguists and communication engineers" (The Formation..., p.179)

[7]Grabar, The Formation of Islamic Art, Yale University Press, New Haven and London, 1987, p.179

and 2). One of these principles explains the priority, in Muslim ornament, of the **abstract relationship between forms** over the forms themselves. It is as if "physical form has been constricted into a vehicle for the expression of something else than itself", namely, its underlying relationship to other forms which is mostly expressed in terms of some sort of **geometric structure**[8] (fig. 3). What is important here is that the reason for this kind of abstraction is tied to **aniconism** and to the avoidance of the, so called, "temptation of visual precision" achieved through an excessive use of artificial colors and patterns which overwhelm other possible themes of restricted significance.[9] It could also be useful here to remind ourselves of M. C. Escher's belief that abstraction has been "imposed" on the Muslim artist as the only allowable alternative for visual representation.[10]
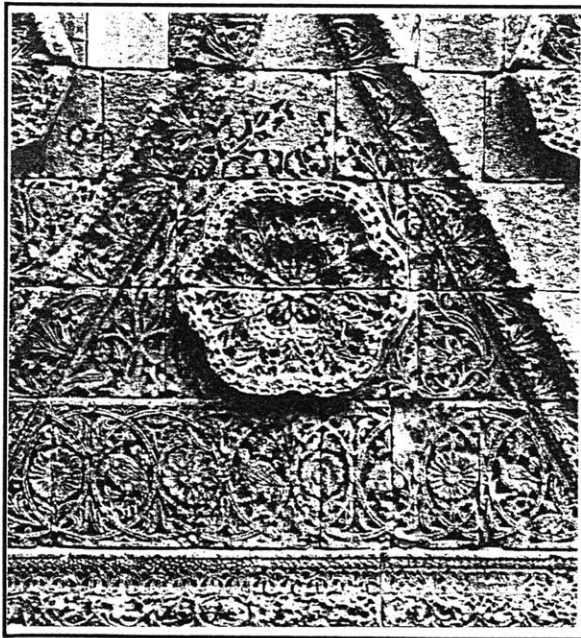
Fig.1: Detail of facade decoratiom from the Umayyad palace of Mshatta

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[8]See ibid., pp.187-88

[9]See Grabar, "What Makes Islamic Art Islamic", <u>Art and Archeology Research Papers</u>, No. 9, 1976, p.3

[10]Escher remarks that:"it is ... unfortunate that the only people obviously intrigued by this possibility [filling of space]—the Moors—were not allowed to proceed beyond abstraction, quite apart from the question whether they would have wanted to." (H.S.M. Coxeter et. al. eds., <u>M. C. Escher, Art and Science</u>, Amsterdam, 1987, p.16)
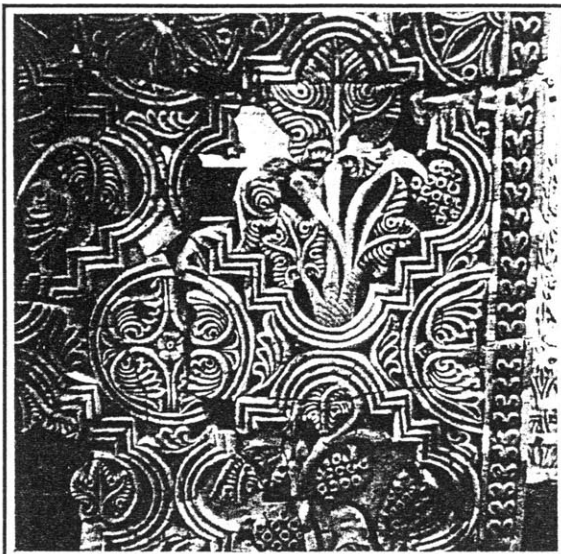
Fig.2: Khirbat al-Mafjar;
decorative panel from bath entrance
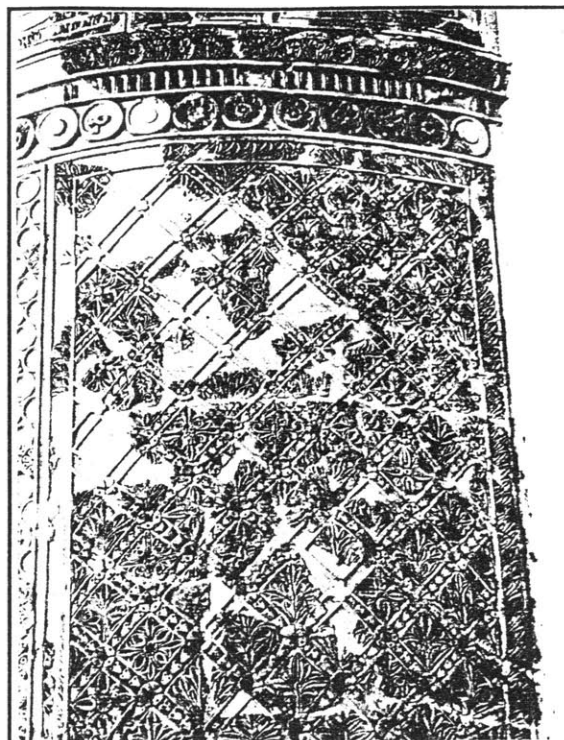
Fig.3: Qasr al-Hayr West;
decorative panel om facade of palace

A second principle explains that within the formation of Islamic art, every one of the innovative early techniques had to do with surface rather than three-dimensional effects. Grabar argues that the culture's energies were consciously much pushed in the direction of **emphasizing surface over shape** and in acquiring the means for being as free as possible from the object's or monument's physical properties. It was—or at least could become—**an art of illusion**, which could make things different from what they were.[11]

As part of a larger argument on the secondary role of pictorial representation in Islam, which is grounded in religious reasons, Ettinghausen, in his turn, discusses the relationship of three-dimensional

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[11]Grabar, The Formation..., p.184

form and surface decoration[12]. The religious principles behind the argument will be discussed in the next chapter, but what is relevant here is its bearing on Grabar's above principles. The abstraction of human figures or the denaturalizing of three-dimensional forms in general is conceived by Ettinghausen as transforming "the living aspect to a purely **mechanical one.**" and preserving it "by the usual severe juxtaposition of strongly contrasting, unnatural colors". This is best achieved through **decoration which helps the object "dissolve", "negate", or "camouflage" its three-dimensional form** (fig.4). The ornament itself envokes "unreality and contradiction" by "unexpected transformations" of living figures into arabesques (fig.5), and through indefinite extension of the ornamental pattern itself.
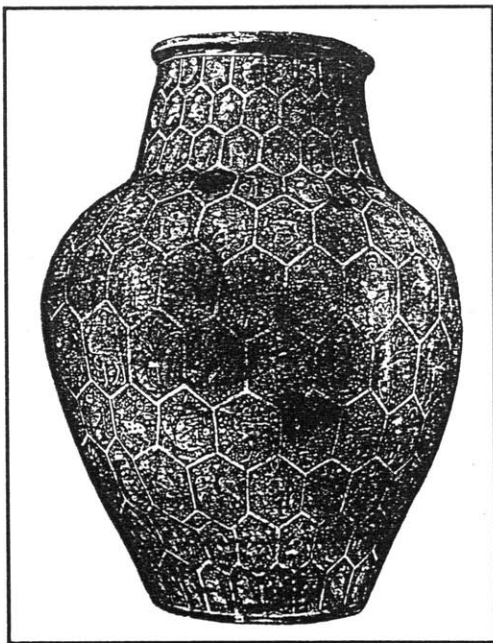
Fig. 4: Luster jar,
second half of 13th cent.

Fig. 5: A door wooden panel, Iran,
9th cent., Egypt

[12]See Richard Ettinghausen, "The Character of Islamic Art", The Arab Heritage, ed. N. A. Faris, Princeton University Press, 1946, pp.256-63

One could easily detect a correspondence between Ettinghausen's notion of a decoration that camouflages an object's three-dimensional form, and Grabar's "art of illusion" which might make things different from what they were. In any case, it might be possible to generalize that scholars, confronted with the relative independence of a decorated surface from the object's or monument's shape, could only find **arbitrariness** in what appeared to be inconsistence with the corresponding more **logical** relationship between ornament and physical context in the Western world. They speculate on possible cultural origins of such a peculiar property of Islamic ornament. The **nomadic background** of the Arabs and later the Turks, is thought to have had a role in shaping the Muslim idea of an "arbitrary ornamental design" independent of the architectural surface, and having its own set of ordering rules. Muslim taste is claimed to have been influenced by the **visual effects of rugs and textiles** especially those that hang vertically in an Arab nomadic tent.

Excessive **geometrization and repetition** are also often linked to a nomadic ethos. Since such a quality was quite uncommon in other cultures, a good cultural reason was supposed to be given for it from within the Islamic history. The origin of this phenomenon is claimed to come from certain nomadic ways of geometrizing design known through weaving[13], let alone, "an immediacy of perception in stark desertic lands which favored **repeatable themes**" in all aspects of nomadic life (including poetry and music) and which would have arguably led into an obsession with geometry and repetition within the later urban culture.

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[13]Grabar, "Geometry and Ideology: The Festival of Islam and the Study of Islamic Art", A Way Prepared: Essays on Islamic Culture in Honor of Richard Bayly Winder, ed. Farhad Kazemi and R. D. McChesney, New York University Press,, in:A Way Prepared, p.149

In <u>The Formation of Islamic Art</u> Grabar considers the point about arbitrary design "a valid generalization about early Islamic ornament". He suggests, however, that the arguments about nomadic origins are mere speculations, but does not completely obliterate the possibility of their influence. Warning against the acceptance of a nomadic mood claimed to exist in the mainstream of a medieval Muslim ethos, he would still propose that "perhaps the reluctance of so much of early urban Islam to use in full the aesthetic forms and ways of the conquered world led to a sort of automatic, almost subconscious appearance of earlier and culturally differentiated ways and forms".[14] In his latest Mellon lecture on geometry, and referring to the geometric designs of the Umayyad palace of Khirbat Al-Mafjar (739-44) (fig.6), Grabar suggests that their abundant use might have to do with the fact that they **repeat easily** and thus lend themselves to **evoke the effect of textiles**, which makes use of repetition as its primary feature and was encouraged by the Umayyade patrons themselves:[15]

> "..... it is only, I feel, because the new Umayyad patrons wanted to create the effect of textile covering—whether rugs or silks—that they transformed so completely a stone architecture characterized for many centuries for its decorative sobriety and preference of sturdy masonaries."[16]

Fig.6: Khirbat al-Mafjar; reconstruction drawing of a stucco panel (after Hamilton)

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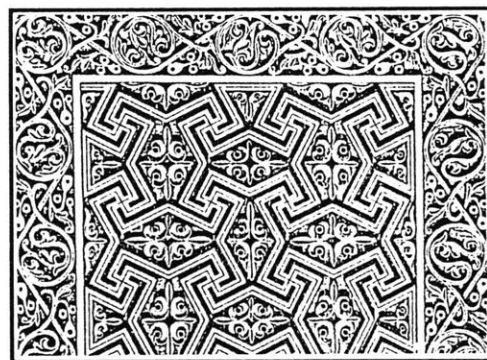
[14]Grabar, <u>The Formation...</u>, p.190

[15]Grabar, "The Mediation of Geometry", <u>Introductory Demons Toward a Theory of Ornament</u>, A. W. Mellon Lectures in the Fine Arts (unpublished draft), 1989, see pp.15-16

[16]Ibid., p.16

In summarizing the above arguments, one could differentiate between three related levels of interest in characteristic features of Islamic ornament, all of which have raised questions about their cultural specificity (their nomadic background in particular), and called for urgent answers that may explain their unmatched existence in the art of the West. The first assumes an **excessive use of decoration**, the second singles out **an emphasis on surface or two-dimensional ornamentation**, and the third demands an answer for a peculiar level of **geometric abstraction** thought to be a resultant of the second. For over-decoration, a cultural-religious explanation is provided on the basis of compulsive aniconism and prohibition of figural representation. It is not just a concentration on decoration, but also an emphasis on planar spreading of designs to which more than one answer was given (ignoring, by the way, the central role of the three-dimensional *muqarnas* decoration). First there is the presumed tendency toward unreality and illusion expressed in the negation or camouflaging of three--dimensional forms. Then, an inclination to cover every possible surface with planar ornament as reminiscent of the nomadic use of textiles, or to compensate for a psychological fear of visual emptiness (an issue to the discussion of which I dedicate the following discussion). And, finally, as a consequence of the obsession with surface ornament comes the mastery of geometric abstraction. Attributed to this is a bias towards a repetitive medium of decoration—related again to a nomadic background, or an interest in self-consuming plane-filling games based on some arbitrary rules.

2- FEAR OF EMPTY SPACE: *HORROR VACUI*

ISLAMIC DECORATION has often been related to *horror vacui* or fear of empty space. This notion comes from the fact that many scholars look at Islamic ornament bearing in mind precepts about decorative principles in Western art. Such scholars were intrigued by the uniqueness

of the solutions presented by Islamic ornament to the problem of filling a
two-dimensional plane. For them, a typical ornamental pattern, illustrated
by almost any design from non-Islamic historical periods and cultures,
would follow the "universal principle" of placing a prominent pattern
against an empty background. that encompasses the main theme without
presenting a life of its own. Now, in most of Islamic ornament, they are
faced with an impossibility of differentiating between positive motifs and a
negative background. Troubled by such a fact, they would use the
foreground-background discipline, that they have been trained to accept as
universal, in order to explain the peculiar attitude of the Muslim artist.
Ettinghausen's analysis of such an attitude goes as follows:

> " .....there was a strong and in certain periods an overriding
> tendency as early as the ninth century to fill the whole available
> space as much as it was feasible. In yielding to this horror vacui, the
> artist would either try to eliminate the empty background to the
> highest possible degree or even better, let it play a decorative role of
> its own and by doing so accord it a positive character".[17]

Many Orientalist scholars consider that *horror vacui* provides a psychic
explanation for the essential role of decoration in Islamic art. M. S.
Dimand, for example, thinks that decoration was favorable because "..... an
empty surface is intolerable to the Mohammedan eye."[18] The "principle of
complete coverage", for Kuhnel, although praised as an aesthetic necessity,
is still thought to be maintained by the so called *horror vacui* which "keeps
the artist from leaving empty spaces in his composition or creating
contrasts which stress more strongly one or the other motif."[19]

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[17]Ettinghausen, "The Taming of the Horror Vacui in Islamic Art", Proceedings of the
American Philosophical Society, Vol. 123, No.1 (Feb. 1979), p.16

[18]Dimand, A Handbook of Mohammedan Decorative Arts

[19]Ernst Kuhnel, The Arabesque: Meaning and Transformation of an ornament ,
trans. by Richard Ettinghausen. Graz: Verlag Fur Sammler, Graz-Austria, 1977, p.8

In discussing early Islamic ornament, Grabar incorporates *horror vacui* as the first of six principles of ornamental design. However, he does not attempt to provide a cultural interpretation for the assumed phenomenon.[20] Referring to examples from Alhambra (fig.7), he acknowledges the difference between classical ornament and Islamic designs in terms of the design/background relationship. And although the "main objective of the ornament was to cover the whole surface of a panel", yet, according to Grabar, the Alhambra designs are "less a case of horror vacui, as it has so frequently been defined, than a much more positive attempt at making every part of the surface significant."[21]

Ettinghausen, on the other hand, poses the question of an assumed obsession of the Islamic artist by the horror vacui and insists on the existence and relevance of a **social and psychological interpretation:**

"......although the density of Islamic designs is an aesthetic quality, it is of such an excessive and universal nature that it **presupposes a special state of mind or reflects social conditions** which insisted on this quality throughout the Muslim world. A possible clue to this problem might therefore be found in other fields which show the same unusual attitude, but where an explanation would be more readily available".[22]

Ettinghausen proposes more than one hypothetical explanation by arguing a parallelism between what he calls "a lavish ornamental production with its horror vacui" and what he claims to be specific illustrations of a similar phenomenon in the mental and social behavioral context of the Islamic culture.[23] In his first cited illustration he sets up a theatrical contrast between two constructed images of the Islamic

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[20]Grabar, The Formation..., p.187
[21]Grabar, The Alhambra, Harvard University Press, 1978, p.193-94
[22]Ettinghausen, "The Taming...", p.18
[23]See ibid., pp.18-19

environment. A dense Near Eastern urban environment, on the one hand, where tightly packed units and crowded conditions are thought to constitute the "way of life" of the people. The other image is that of an empty and hostile world outside the city walls with deserts and treeless mountains, wild animals, jinns, thirst, and fatigue. The first is supposed to reflect "the pleasantness of a rewarding existence" and to be paralleled to the desired density and compactness in ornamental design as "products of urban workshops". The emptiness of the second image is thought to be "associated with conditions antagonistic to civilization and the good life" and thus to stand for the fear and avoidance of empty space in the artistic production.

Ettinghausen's argument in his first hypothesis is not only based on an exotic and whimsical imagery of the environment and mentality of the Muslim people, which reminds us of an Orientalist tradition, its implication, moreover, of the correspondence of such images to the world of ornament is a premature conclusion. His other hypothetical argument suffers, again, from similar limitations. What is hinted at here is a relationship between over-ornamentalization and "the way an object is to be "honored" by its decoration" on the one hand, and, on the other hand, an assumed "tendency in the Islamic world towards **exaggeration and lavishness......** in personal relations" centered on extreme subservience towards superiors, polite exaggerations in everyday conversations and "overwhelming hospitality towards one's guests". His admittedly prosaic example of honoring friends at a Muslim meal, although explicitly illustrating the honoring of a decorated object, implicitly reveals an absurd parallelism between arrangement of dishes on a dining table and the filling of space in an ornamental design: "When friends are entertained, ... the vast number of offered dishes will completely cover a large table so that one is hardly aware of the table-cloth".

Confronted, therefore, with "unusual" artistic tendencies (the usual being the Western), Ettinghausen and others are obsessed with looking for pseudo-cultural justifications which are bound to be found somewhere in the culture or, otherwise, simply made up. Whichever seemed to be unusual or different in Islamic art would have had nothing to do with the possible existence of an alternative creative way of solving an artistic problem— which is at least equally interesting—but rather must have had a bearing on idiosyncrasies of social norms or habits of living; as if the gate of creativity and originality was closed after Antiquity and the Medieval West.

3-   THE ORIENTALIST THEME OF THE ARABESQUE

THE WORD "ARABESQUE" appears in almost every discussion of the art of decoration in Islam. It is not only often used as an alternative to Islamic vegetal ornament, but all Islamic ornament, and even the whole of Islamic art, has long been associated with its presumed characteristic significance. It is therefore important to examine the origins and development of these tendencies, and to find out to what extent did the notion of "arabesque" affect the interpretation of Ornamental art.

"The very term "arabesque" suggests an arbitrary Western approach to Islamic art—there is no pre-modern Arabic equivalent for the term".[24] Its Orientalist origin corresponds to an outsider's view of an alien art rather than an insider's view of himself. Moreover, to reduce ornament, or one specific type of ornament, to a term derived from the root "arab" does not only emphasize its Arabic origin but could rather imply that it was the major, **if not the only**, artistic, or even cultural, contribution of the Arabs, and would therefore support the common Orientalist claim about the

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[24]Terry Allen, Five Essays on Islamic Art, p.2

limited artistic creativity or even the "cultural vacuum" of pre-Islamic Arabia.

There has often been, and still is, confusion as to the range of things associated with the arabesque. Some associate the arabesque to both the geometric and vegetal forms of ornament of the Islamic East. Others refer to all decorative aspects including ornamental inscriptions and figural motifs. Today the term might even be used to denote aspects of Arabic designs including furniture, music, and clothing, and is usually meant to parallel Turkish or Moresque.

The most common use remains related, however, to vegetal ornament and more specifically to one type of stylized, geometrized and extendible vegetal design. Alois Riegl (1858-1905), in his book *Stilfragen* (Berlin 1893), is thought to have been the first to attempt a serious definition of the arabesque.[25] Terry Allen tells us:

"For Riegl the principal features of the arabesque were the **geometrizations** of the stems of its vegetation, the particular **vegetal** elements used, and the fact that these elements can grow **unnaturally** from one another rather than branching off from a single continuous stem. But above all Riegl pointed out that the arabesque has *unendliche Rapport*, or **infinite correspondence**, meaning that the design can be extended indefinitely in any direction."[26]

Herzfeld followed Riegl's main lines. He considered the arabesque as "the dominant feature of supreme authority for the whole art of Islam".[27] He developed Riegl's definition giving more credit to "the principle of **variety**, which creates more combinations and variations", and to

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[25]See Kuhnel, The Arabesque, p.4, and Allen, Five Essays..., p.3
[26]Allen, Five Essays..., p.3
[27]Herzfeld, Encyclopedia of Islam,s.v. Arabesque

dematerialization, which abstracts and **amalgamates** the decorative elements "without the accentuation of distinctions".[28]

Ernst Kuhnel's booklet *Die Arabeske* (1949) was completely devoted to the study of the arabesque. He essentially relates the arabesque to a general tendency of the Muslim artist to transform "what we sense in the natural laws into unreal forms";[29] a phenomenon which is based, in its turn, on the reluctance "to give permanence to temporary earthly forms".[30] The "outstanding position of the arabesque", Kuhnel thinks, is due to the "**delight** in ornamental meditation and in esthetic asceticism", and to an unusual "**ambition**" which went beyond the invention of new variations for a basic form. His admiration for variation, however, which he thought was "unique in the history of ornament", did not prevent him from commenting that:

> "In today's world, it is very difficult to imagine how divinely inspired artists were, during their whole lifetime, satisfied to limit their imagination to a decorative motif which, though highly variable, was nevertheless very restricted in its expressiveness. It is even more puzzling that for whole periods, totally different ethnic groups fell under the spell of this ornament."[31]

Whereas Kuhnel insists on the relationship of the art of the arabesque to the Islamic teachings, Terry Allen, on the other hand, sees that it is almost "unjust to art historical logic to see the arabesque as somehow 'Islamic'". He considers the arabesque the "outcome of artistic movements set in motion centuries before it appears, not the immediate result of the cultural split that created the Islamic world".[32]

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[28]Opcit., p.3. Quotations are translations by Allen from Herzfeld, Genesis, pp.44-45
[29]Kuhnel, The Arabesque, p.7
[30]Ibid., p.5
[31]Ibid., p.6
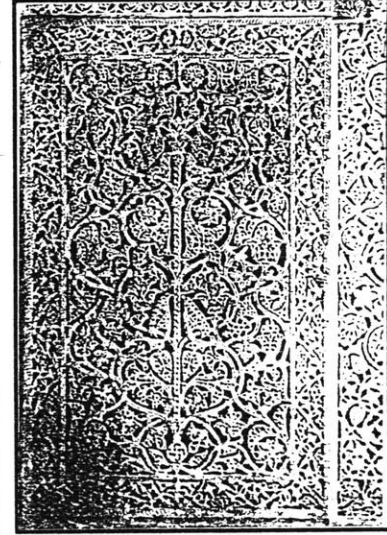[32]Allen, Five Essays..., p.9

Allen considers that Riegl's *unendliche Rapport*, which involved the extension of a geometric construction, had precedents in Antique decorative art (fig.7), and that it was not a sufficient characteristic for the definition of

Fig.7: Floor mosaic in museum at al-Jim, fourth century

Fig.8: Wall decoration in plaster; Samarra

Fig.9: Marble fragment from mihrab area; Great Mosque, Cordova

the arabesque. What is new in the developed version of the arabesque, according to Allen, is the interlacing of the vine scroll with geometric frames (fig.8) and, later, the complete "**assimilation of vegetation to complex geometric patterns**" (fig.9) which resulted in a "highly variable and adaptable system of vegetal decoration *whose method of construction is of intrinsic interest*".[33] But whatever new the arabesque had brought to the Islamic world, Allen still insists that it is "methodologically vacuous to attribute that difference to something "Islamic", or, as Riegl did, to *orientalische Geist* ("oriental spirit")".[34]

[33]Ibid., see pp.4-6
[34]Ibid., p.9

Al-Faruqi's critique of orientalist scholars of Islamic art ignores the orientalist origin of the term "arabesque". He utilizes the very term for two different purposes. The first pertains to the arabesque as an ornamental design which is Arab in its *esthetique* like Arabic poetry or the Arabic Quran. He is not interested in the historical development or stylistic particularities of arabesques but rather in their structural nature and aesthetic comprehension. He differentiates between floral and geometric arabesques and between planar and three-dimensional ones. His cultural concern is limited to the **'Arabicness' of the arabesque** as it relates to his notion of "Arab consciousness" which he considers as the historical substrate of the Islamic revelation. The second use of the term transcends the Arabic or Islamic visual arts, and transforms the arabesque from an ornament into a **generic notion** which "gives unity to the arts of the most diverse peoples", and is applicable to all visual, literary, and other forms of Islamic art. **Every form of Islamic art becomes an arabesque** by sharing a single archetypal structure similar to that of the arabesque.[35]

Finally, whatever the origin of the word "arabesque" could be, and regardless of the confusion about the range of its associations and connotations, or the misconceptions about its nature and *raison d'etre*, it has always been, and remains a major attraction to a large number of scholars whose interest might range from establishing the historical development of its type, exploring its characteristic aesthetic qualities, or pursuing a connection between its mode of realization and Islamic principles. In most of these attempts, however, the relevance of the discussed issues, and the emphasis on a selected few (denaturalization, dematerialization, infinite extendibility...) reflect an outsiders' curiosity to

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[35]See Al-Faruqi, Tawhid: Its Implications for Thought and Life, The International Institute of Islamic Thought, 1982, chapter XIII

pin down the identifiable differences of the arabesque, as a product of a "different" culture, from corresponding types of ornament in the West.

B- CULTURAL (AND SPECIFICALLY ISLAMIC) MEANINGS IN ORNAMENTAL ART

1- IS THE QUESTION OF GEOMETRY CULTURALLY BOUND?

"It is out of the participation in the general system of symbolic forms we call culture that participation in the particular we call art, which is in fact but a sector of it, is possible. **A theory of art is thus at the same time a theory of culture**, not an autonomous enterprise. And if it is a **semiotic theory of art** it must trace the life of signs in **society**, not in an invented world of dualities, transformations, parallels and equivalencies."[36]

T O WHAT EXTENT does Geertz's hypothesis hold true when one looks at Islamic art and its use of geometry in particular? And since the use of geometry is not the exclusive prerogative of Islamic art but rather found to a greater or lesser extent in all traditional art, in the West no less than in the East, **could the question of geometry be culturally bound?** And where should we locate the question of ornament and geometry between **the universal and the cultural alternatives?**

As for **the use of geometry across different cultures**, and after a survey of some examples of geometry in ornament outside the Muslim world, Grabar concludes that although geometry seems to be ubiquous at all times and across most cultures, **its ubiquity however is not consistent**. Geometry as a

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[36]Geertz, Local Knowledge, 1983, p.109

primary subject, for example, "was relegated to relatively limited role in Western painting and sculpture", with the exception of "our own post-Cubist times" where Mondrian and Escher could be singled out as two twentieth century Dutchmen who demonstrated a special interest in geometry.[37]

The inconsistency in the ubiquity of geometry corresponds also to a **variety in its meaning and possible interpretations**. Are we to consider geometry as a universal language, a reflection of some ideal or the most attractive way to satisfy the viewer? Should we see in circles, triangles, or straight lines a "theoretical cosmic and metaphysical potential"; should we detect "automatically matrimonial status or social position", or a "language" of "arbitrary signs and numbers"?[38] This possibility of alternate explanations constitutes, in Grabar's opinion, a "typical art historical problem":

> "...there seems to be a conflict, or at least an unresolved relationship, between two categories of visual observations and reasonings. On the one hand, there is **a taxonomy of forms, a list of theoretically definable, achronic, and culturally independent items** like circles, duodecagons, or stars. On the other, there is **a cultural, synchronic, and unique moment of time which chose to make, show, acquire, order, or use these forms in or on a single object**. Different methods are required to handle one or the other of these models and the question is whether they can be reconciled. More precisely, what criteria of judgement, analysis, or appreciation are appropriate when one considers geometry-related issues? **Are they the criteria of the culture or of some abstract mathematical construction?** What is the appropriate equilibrium between the two?"[39]

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[37]Grabar, "The Mediation of Geometry", see pp.4-6
[38]Ibid., pp.7-8
[39]Ibid., p.3

2- SYMBOLIC MEANINGS AND FUNCTIONS ATTACHED TO ORNAMENTAL DESIGNS

C ONSIDERING THE SYMBOLIC CONTENT that could be associated to visual forms in the art and architecture of Islam, one could question first **the universal vs. the cultural** nature of such a system; i.e. to what extent is a symbolic argument culturally bound or universally applicable? Referring to art in general, Geertz remarks on the relationship between form and its symbolic content:

> "**The unity of form and content** is, where it occurs and to the degree it occurs, a **cultural achievement**, not a philosophical tautology. If there is to be a **semiotic** science of art it is that achievement it will have to explain."[40]

Then there is the problem of whether **a visual symbolic system** or systems, if they exist, could be identified as **specifically "Islamic"**. While some think that "the symbolic functions of art and architecture as we understand them today, are predominantly nineteenth-century romantic European notions"[41], others would consider that a sound symbolic theory might be applied, or at least tested, in an Islamic context irrespective of its origin. The **third** relevant issue here is the extent to which we can **generalize** about the presence of a specific symbolic system in various facets of Islamic visual arts, especially when it comes to the **case of ornament**, and the **particularity of its function.**

It might be tempting to think that the function of decoration is independent or unrelated to the purpose of a monument or art object except in the general unexpressed use of beautification, but isn't it unreasonable to expect enormous efforts on meaningless forms? The **idea of a meaningless decoration**, however, is not uncommon. Al-Faruqi argues that some

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[40]Geertz, Local Knowledge, p.102

[41]Mahdi M., "Islamic Philosophy and the Fine Arts", Architecture as Symbol and Self-Identity, The Aga Khan Awards, Philadelphia, 1980,, p.43

Orientalist scholars even considered Islamic art "contentless".[42] He illustrates with M. S. Dimand's statement that "Mohammedan art is essentially one of decoration"[43]. And since decoration, for Al-Faruqi, lies outside the contentual domain of art, Dimand would be consequently denying any content for Islamic art. Grabar, on the other hand, cannot accept the notion of a contentless decoration:

> **"To dismiss this decoration as "mere" decoration is a Western Imperialist reflex from a society which equates meaningful decoration with representation** and which for half a century has rejected decoration within its own "progressive" architecture."[44]

Grabar even remarks that if there were any Islamic symbolic systems, "they are to be sought not in architecture but in decoration"[45]. And although he does not avoid discussing a formal ornamental syntax, he still thinks that ornament could be considered independent of its own decorative motifs in many aspects:

> "... for every new patron or purpose may introduce a new taste or a new idea. **Social, psychological, ethnic, religious, economic functions** are all involved in the explanation of a given ornamental design".[46]

According to Terry Allen, "The use of the arabesque and geometry always serves the purpose of **increasing the visual richness** of an object or building...". He does not deny the possibility of some iconographic associations, "in at least some cases", but he puts away, as "anachronistic ideas", the argument that "the arabesque, firmly identified with the vine scroll, somehow refers to the vegetal world, and geometric designs allude

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[42]Al-Faruqi, "Misconceptions of the Nature of Islamic Art", Islam and the Modern Age, Vol.1, No.1 (May 1970), p.31

[43]Dimand, A Handbook of Mohammedan Decorative Arts,, p.12

[44]Grabar, "Symbols and Signs in Islamic Architecture", Architecture as Symbol and Self-Identity, The Aga Khan Awards, Philadelphia, 1980, p.10

[45]Ibid, p.9

[46]Grabar, The Formation..., pp.184-85

somehow to the laws of nature that govern the cosmos, or the rules of construction by which man constructs such things as buildings".[47]

Lisa Golombek, on the other hand, is convinced by the necessity of introducing meaning to a seemingly meaningless ornament, and obsessed with the question of the function of Islamic architectural decoration. She introduces the idea of the "**textile metaphor**"—"decoration as a 'membrane' or fabric encasing the body of the architecture".[48] She extends the textile analogy to its limits differentiating thereby **two approaches to decoration and their association to two different types of costume in the medieval Islamic world**. The first mode of decoration is that which frames the various architectural elements and defines separate parts or layers. It has a "**fitted look**" comparable to that of a tailored garment (fig.10):

> "Like a tailored garment, with its fitted sleeves, nipped waist, and collar, this decoration is adapted to the separate parts. Every transition is defined by a border and a new pattern designed to fit the new shape."[49]
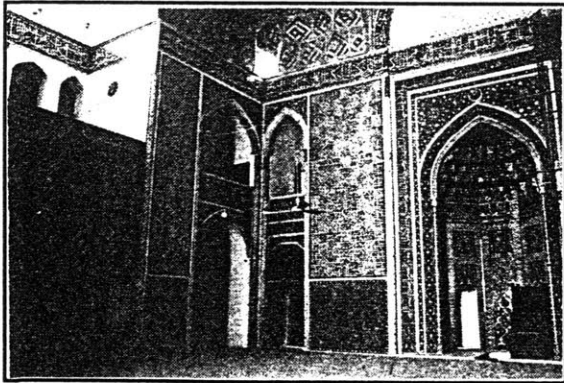
*Fig.10: Yazd, Masjid-i Jami'. 1364-75 and early 15th century; interior of prayer hall*
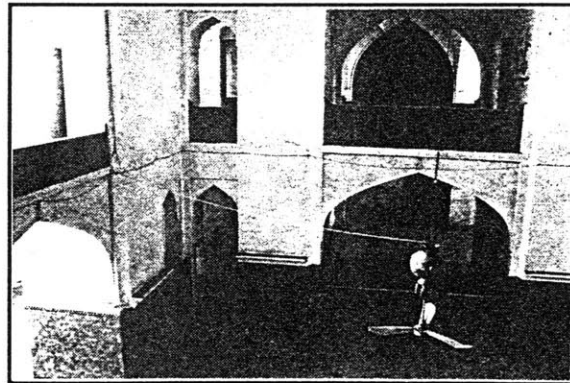
Fig.11: Yazd, Masjid-i Mir Chaqmaq, 1437; interior of prayer hall

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[47]Allen, Five Essays..., p.54

[48]Golombek, "The Function of Decoration in Islamic Architecture", Theories and Principles of Design in the Architecture of Islamic Societies, ed. Margaret Sevcenko, The Aga Khan Program for Islamic Architecture, 1988, p.39

[49]Ibid., p.39

She calls the second type the "**draped mode**" trying to relate it to her more general notion of a "draped universe" of Islamic art. In this type an association is claimed to the Arabic *abaya* or "the free-flowing Mediterranean draped robe". Here there are no nested frames or zones with dividing borders; monuments are either "draped in white" (fig.11) or the ornament itself wraps around surfaces in a neutral fashion "revealing, as it were, the shape of the body underneath". Geometric patterns extend across surfaces and around corners and inscription bands move in and out of solids and voids tying whole ensembles together[50](fig.12). Referring to the portal of the Ince Minare at Konya (Fig.13), Golombek remarks:
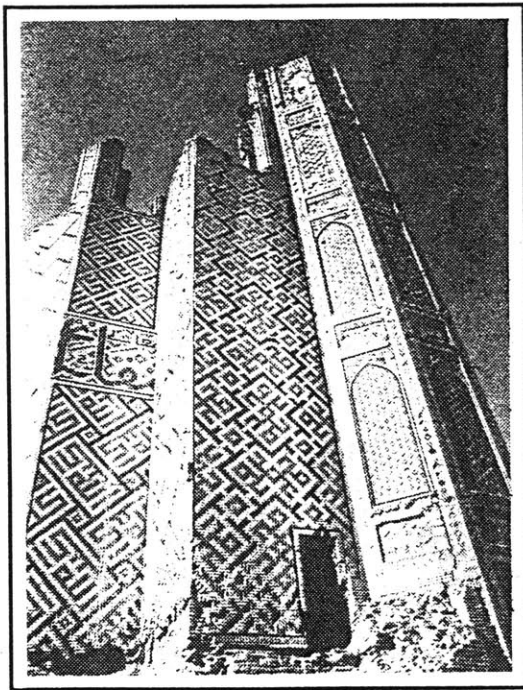
Fig.12: Samarqand, Masjid-i Jami' of Timur. Side of iwan pylon showing juncture with octagonal minaret
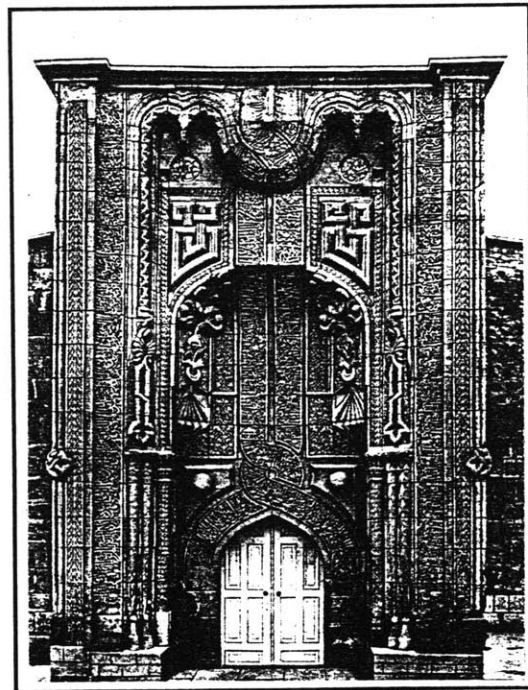
Fig.13: Konya, Ince Minare, 1258. Portal

"The outer frame resembles a curtain, drooping in the center, as often seen in thirteenth-century illustrations from the *Maqamat*... The inscription bands run vertically down the center like the two edges of the *abaya*, decorated with their tiraz bands. One could even

[50]Ibid., see pp.39-43

imagine the lateral ornaments as applied braid, terminating in tassels."[51]

Attempting to build a theory out of her observations, Golombek tries to **generalize** her hypotheses all over Islamic regions, across different historical periods, and for various material-related techniques of decoration. She is not content with the suggestion of **a visual analogy between clothing and surface decoration**, she even wants to pursue a more subtle relationship on the level of design process of ornament as well as architecture:

> "The primary grid, which assisted in the design and construction of the building, survived as an 'after-image' and became the starting point of all decoration... The orthogonal grid in which straight lines intersect at right angles is, of course, the grid of the loom, from which even the most elaborate of textiles must be generated. Thus **the imaginary grid could have suggested a textile itself and led the architect to treat the building as an object to be covered, or dressed.**"[52]

Grabar, on the other hand, is less interested in personal speculations about visual analogies in matters of techniques and design process. Although he seriously considers textile effects of ornament as we will see later, his primary objective is to learn about the significance of ornament and geometry to the artisan or viewer at the time of production or visual encounter, and whether it was meant to satisfy one or a combination of **visual, psychological, and practical needs**. He has pursued such an objective over a period of time and in several inquiries through which one can detect a clear line of development that is, however, not devoid of occasional confusion or minor contradictions.

In The Formation of Islamic Art (1973), Grabar distinguishes between a specific *ornamental* theme, and **general themes**—regardless of

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[51]Ibid., p.43
[52]Ibid., p.44

iconographic meaning—to which he assigns the term *decorative*. The general case may include themes where the main function of the work of art was to transmit the message of its iconographic component as in most of medieval Christian art. The ornamental theme, on the other hand, illustrates the **uniqueness of the Islamic phenomenon** in what is defined as a modification in the signifying value of forms. This particular theme is thought to be easiest to observe in architectural decoration where they might have an independent style but **no "intellectual or cultural content, and their function is simply that of beautification,** of endowing the monument on which they are found with **visual pleasure".**[53]

Grabar's main argument in the early phase of research was that the Islamic culture "has sponsored through geometry a set of **neutral forms whose only purpose was to please,** to make agreeable, thus to beautify". They could carry a message only if they were charged with iconophoric meaning through **external vectors** like inscriptions.[54] He later realized, however, that to deprive the Islamic ornamental themes of any intellectual content is certainly not an accurate generalization, and that investments of funds and energy could not have aimed simply at creating "agreeable neutral forms". In his 1989 Mellon lecture on geometry he reconsiders the issue of geometry as part of a general theory of ornament. He differentiates between, first, geometric forms which have "acquired a concrete meaning" and have become **"iconophoric rather than ornamental"[55];** second, **designs where geometry is an end in itself** and its own object of contemplation—as best illustrated in the case of "wallpaper" patterns, and third, cases where geometry acts as a medium which attracts not to itself but to some other idea or function The first two cases, however, are considered to be exceptions to the general proposition which remains that geometry, rather than being an
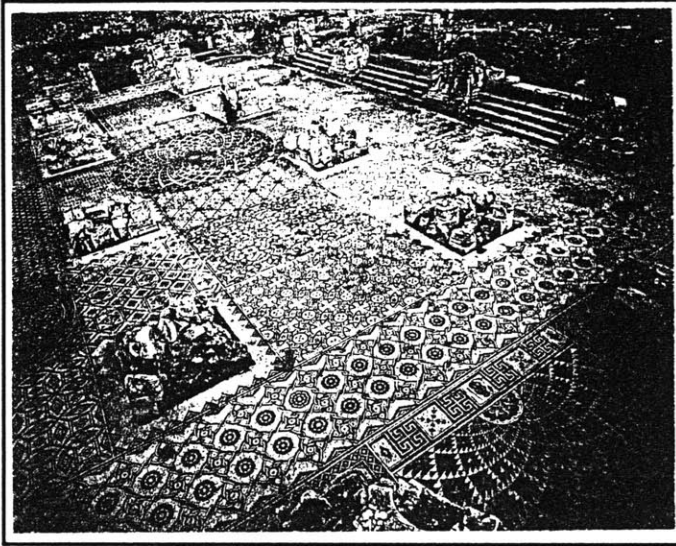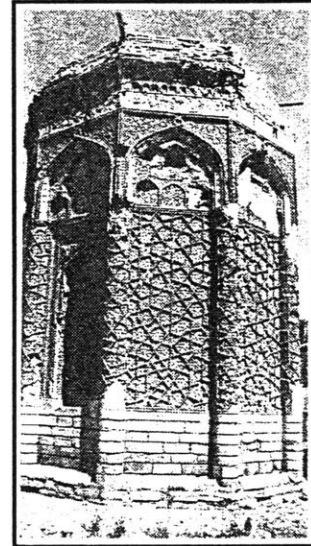
[53]Grabar, The Formation...., p.179
[54]Grabar, "The Mediation...", p.22
[55]Ibid., p.20

end in itself, or the subject of a specific iconophoric message, is **a n intermediary vehicle to some other effect, function, or technique, not a representation of it, but an expression of its essence.**[56]

Fig.14: Khirbat al-Mafjar, bath, eighth century, mosaic pavement

Fig.15: Maragha, Gumbad-i Qabud, 1197

Grabar illustrates his hypothesis using more than one argument. First there are those "less rigid" designs where an **"implied geometry"**, "supporting writing, vegetation, animals, or even personages", acts as a **"convenient means to hang a narrative....** [an] invisible support for a statement that would collapse without it".[57] Then there are clues from Khirbat Al-Mafjar decoration (fig.14) which led Grabar to the proposition that: repetitive geometric designs that cover walls and floors are not meant to be ends in themselves but rather as an instrument manipulated to evoke the **effect of textile covering desired by the patrons.**[58] A third argument for the use of geometry, as an expression of something other than itself, comes

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[56]Ibid., p.16

[57]Ibid., pp.9-10

[58]Ibid., pp.15-16. Although we are reminded here by Golombek's textile analogy, Grabar's analysis, however, refers to the essence of a textile effect—surface covering and repetitive motifs—rather than a representation or mimicry of clothing techniques.

this time from the eleventh century "brick style" decoration in Northern and North-Eastern Iran (fig.15), and is also thought to apply to the general use of *muqarnas*. The message in this case did not lie in the specifics of the individual patterns, but rather in the richness of the designs and the effort spent on applying new variations, which can be translated, in **social** terms, "as **distinctions between different ranges of investment in transmitting a visual message**".[59]

The problem of function and meaning has raised, as we have seen, a multitude of sensitive issues the answers for which, apart from being difficult to find, can easily overlap, confuse, or lead to contradictions. First there is the question of whether or not we can attribute a function to ornament and geometry in particular. Should we look at geometric abstractions as a purposeful endeavor or as a repetitive game of covering space with changeable and arbitrary rules? And if we opt to attribute to it any kind of purpose, would it then be considered as a carrier of a symbolic meaning, or as a medium for conveying a particular external message? In case it expressed a specific meaning, could that meaning be semiotic, iconographic, or iconophoric? And if it were to act as an intermediary, would it be a mechanical instrument for organizing and proportioning, or a perceptual tool to attract a viewer's attention; and would the transmitted message be purely visual, socially desired, or religiously related?

Geometry in ornament, therefore, often lends itself to alternate explanations leaving to the viewer an **ambiguous range of choices**. But are ambiguity and ambivalence to be positively considered, or would they limit the creativity of geometry or affect its status as a work of art?

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[59]Ibid., pp.18-19

3- AMBIGUITY VS. SPECIFICITY OF MEANING

I N DISCUSSING THIS ISSUE, I shall limit myself to the works of Grabar who has often elaborated on the range of possible meanings given to Islamic ornament. In an early essay, and referring to some forms and techniques of Islamic art, Grabar suggested that any one of them "seems to be endowed with a range of meanings, which creates in the observer a sense of **ambiguity**, of **uncertainty**, about their interpretation. It is as though the forms themselves are **neutral**, almost indifferent. But ..... they can be **charged**" and made "**specifically meaningful**" by different devices.[60]

In discussing Ettinghausen's position on the question of symbols, Grabar noted that Ettinghausen limits the identifiable symbols in Islamic art to those that are historically older than Islam but maintained in the new culture. Such symbols deal with **secular themes** or with what may be called **"basic" religious symbols** (earth, fire, life). But even an obviously new theme like writing, which Grabar thought to be not merely ornamental and iconographic but also vectoral in the sense of charging neutral forms with concrete meanings, is considered by Ettinghausen not to be necessarily associated with a strong, specific and unchanging meaning. Ettinghausen also thinks, according to Grabar, that it is this **low symbolic charge** of Islamic forms which made it easy for them to be copied and imitated.[61]

What Grabar found problematic about Ettinghausen's argument was that to think about forms as having only a low capacity of being charged with meaning can easily lead to a **generalized ambiguity** in meaning and to a culture that operates on an ambiguous visual system.[62] He preferred to distinguish, especially in his early work, between **degrees of ambiguity** in

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[60]Grabar, "Islamic Art: Art of a Culture or Art of a Faith?", p.2
[61]Grabar, "Symbols and Signs...", p.4
[62]Ibid., p.4

different situations. and to differentiate consequently between decorative motifs that have a possible iconographic significance and those which do not seem to lend themselves to such a property. Yet he always leaves a margin for uncertainty especially when he questions the validity of proposing precise interpretations for the former, and wonders whether the latter had some iconographic significance that is no longer understood.

Nevertheless, a **middle position** between arbitrariness and meaningfulness is after all preferred. Ornament was not only a purely arbitrary design exercise with the mere objective of beautifying the surface to which it is applied, nor is it necessarily the presumed opposite aiming at a visual or formal expression of an implied message. A **tension**, therefore, could have existed in the aesthetic intentions of the designer; between an interest in the intricacies of the **partial** iconographic themes, and, on the other hand, a concern for providing a kind of **overall** ornamental luxury in which individual subjects are drowned into insignificance. This tension between parts and whole would have then resulted in **ambivalence**, whereby a given phenomenon lends itself to two simultaneous and partly contradictory interpretations.

But, again, Grabar wonders whether ambivalence is really a result of the artisan's original intention or simply a misinterpretation of iconographic vs. ornamental significance on our part".[63] He even hesitates, in another instance, to accept the whole notion of a **"willed visual ambiguity"**, so frequently used by himself and other scholars, and which has become "so fascinating to contemporary artists and critics"[64]:

> "I wonder whether such a conclusion [regarding the possibility of more than one interpretation] and the concomitant excitements contemporary artists and critics have found in Islamic art is not

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[63]Grabar, The Formation..., p.180
[64]Grabar, "Islamic Art: Art of a Culture...", p.5

simply the result of ignorance. For I doubt very much that traditional Islamic culture or any other major or successful culture would have emphasized unclarity in meaning as the objective of its creativity".[65]

Looking at the above arguments, one cannot help but encounter a sense of confusion whereby there is a lacking clarity of whether **ambiguity** in the interpretation of ornament is given a **positive or a negative valence**. It is sometimes seen as a source of excitement, or related to **ambivalence** which does not necessarily carry a negative charge. In other instances, however, it is equated to **uncertainty** or even to **unclarity**. And finally, in the Mellon lecture, there is the implication that this same ambiguity—or **freedom of choice of associations** as it is expressed here, in the case of geometry in particular, could even limit the creativity of geometry as a work of art:

> "[Geometry] leaves to the viewer or user a freedom of choice no other intermediary seems to offer. In this respect, as a harbinger of free choice, geometry is a most **dangerous** medium. It forces one to look out and to decide what to think, what to feel, and what to do. It rarely forces us to anything. The penalty of freedom in the arts is **loss of meaning**. Its reward is accessibility to all."[66]

In order to avoid an understanding of the relationship of meaning and form based on uncertainty or purely personal judgements, we are in urgent need to differentiate between an outsider's attitude to the question of symbolic meanings, and that of the culture itself at the time of production. More investigation has to deal with the public interest in art and ornament, the visual associations of the society at large, and the effect of the concomitant intellectual discourse, if any, on shaping the role of the maker as well as the viewer of the artistic work.

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[65]Ibid., p.6
[66]Grabar, "The Mediation...", p.26

C- ON THE SOCIAL AND INTELLECTUAL STATUS OF ORNAMENTAL ART

P ART OF SCHOLARLY WORK dedicated to the study of Islamic ornamental art investigates the intellectual status of the art at the time of its production and the corresponding social involvement in its process of making and evaluation. The primary aim is to look for the existence of any theoretical undertakings by the intellectual leaders of the time which may have influenced the actual creative process of the artisans or the aesthetic appreciation of the public at large.

Regardless of the luxurious fantasies of the Thousand and One Nights, esthetic democratization is thought to have been a major characteristic of **the relationship of Islamic art to the society** which surrounds it, sponsors it, and uses it. The **accessibility** of most of the arts and its usefulness for the whole social body are what count here. Grabar assumes that it was not only most of the architectural production that followed the above rules, but rather "practically all other artistic activities were similarly directed to making daily, public or private life, more attractive and more exciting".[67] Pottery, textile and calligraphic techniques were used in all levels of society and for all kinds of purposes, and even painting was used as an art of illustration for written texts.

Architectural decoration, in particular, with its numerous techniques and motifs was used to express similar aesthetic qualities to be comprehended at all levels of society—if not in palaces and garden pavilions, in mosques, schools, caravanserais, baths... etc. The **popularity of certain ornamental techniques** is given a socio-economic dimension. The best example is stucco as a wide-spread technique in the Islamic world, both

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[67]Grabar, "What Makes...", p.2

historically and geographically. The reason was its cheapness and its flexibility to provide different desired effects at different social levels. Its quality as the freest medium of architectural decoration made it easy to be used for whatever purpose a patron or an artist may have wanted.

As to the intellectual status of the art, a more important, and still controversial, question which might be brought up is whether Islamic art and architecture, as it is often claimed, were mere building or craft, revolving around **the role of the artisan or builder**, or whether there was a concomitant **intellectualization or theoretization of the process of production and the quality of the product itself.**

When it comes to the relationship between Islamic philosophy and the arts in general, it is thought that at least on the theoretical level "there is an affinity between the way the philosopher looks at the world and the way the artisan conceives of his work, inasmuch as they both consider a whole, its parts, and the relationships among those parts."[68] They both share the same enterprise of a natural whole; the first is concerned in knowing it, the other conceives of it while aiming at producing it. All of that, however, is obviously not characteristic of Islamic philosophy in particular, and what is more relevant therefore is the effect of philosophical treatises of medieval Islam on the reality of life and art.

Al-Ghazali's <u>Alchemy of Happiness</u> *(kimya'ul sa'adah)* written about 500 H. (A.D. 1106) is commonly referred to as a significant resource for understanding the **medieval attitude towards the beautiful.** Ettinghausen argues that the book must have exercised a definite influence on **common people**, craftsmen and artisans, and their patrons, because al-Ghazali "wrote it in Persian, that is in the vernacular language of his country, and

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[68]Mahdi, "Islamic Philosophy and the Fine Arts", p.45

without any difficult expressions or obscure and intricate trends of thought".[69]

But even if we agree with Ettinghausen, the above treatise remains to be only one example. And on the whole, the contribution of philosophical treatises remains restricted to occasional setting of general rules that could govern artistic production, coupled with a general lack of analyses of such rules "as they apply to the production of particular works, except by way of giving examples".[70]

As to the **role of medieval professional mathematicians in guiding and explaining the work of artisans,** one view would give mere credit to the development of the **individual mathematical skills of the artisan** achieved only through his own widening experience. Others are furnishing more evidence of the contribution of medieval mathematicians to the field, or, at least, they attribute **theoretical knowledge of geometry** to the artisans themselves.[71]

Referring to an "unpublished doctoral thesis"[72], Grabar cites "evidence which is only now being discovered ... [of] a conscious attempt on the part of the professional mathematicians and scientists to explain and to guide the work of artisans."[73] Following the same evidence, Renata Holod suggests an intellectual interest in geometry of intellectual leaders other than architects and artisans. She talks about "an unbroken **tradition of geometric thinking** which began with al-Khorezmi, al-Kindi, al-Farabi, Buzjani, al-Baghdadi,

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[69]Ettinghausen, "al-Ghazzali on Beauty", Art and Thought, ed. K. Bharanta Iyer, London, 1947, p. 160

[70]Mahdi,"Islamic Philosophy and the Fine Arts", p.45

[71]A. J. Lee, "Islamic Star Patterns", Muqarnas, ed. Oleg Grabar, E. J. Brill, The Netherlands, Vol. 4, 1987, p.182

[72]Grabar, The Alhambra, 1978, pp.195-96 and note 32. Wasma Chourbaji is the author of the indicated thesis which was the first serious study of Buzjani's work.

[73]Ibid., 1978, p.196

the Banu Musa and others".[74] She also emphasizes the role of mathematical treatises from the ninth to the fifteenth century like those of Abu'l Wafa' Buzjani (940-998) and Jamshid Ghiyath al-Din al-Kashi.

Terry Allen, on the other hand, emphasizes the "distance of art from intellectual life"; he considers the arabesque and geometry as "primarily visual inventions rather than intellectual constructs":

"Geometry was not necessarily part of a cultured man's education; literature was. So we may expect that there was some communication between geometers and architects, but not the sort of programmatic connection between architecture and science that is familiar from Antiquity or the Italian Renaissance."[75]

The increased complexity in the use of geometry, Allen argues, is "primarily a matter of increasingly displayed **artisanal virtuosity**". The design themselves came as a development of Late Antique patterns and were made more complex only to satisfy new and specific artistic applications.[76]

A. J. Lee, in his turn, also gives primary importance to the empirical knowledge of craftsmen. He considers that Western scholars have seriously overestimated the theoretical background which a professional mathematician might have brought to bear on the problem of pattern design and construction.[77] He thinks it is still unclear in which way the mathematician could have guided the work of the artisan, or as for the scope and effectiveness of such a guidance if it existed:

"Even if this claim is true, the influence of the mathematicians cannot have been very widespread or long lasting, judging by the many clumsily constructed patterns in existence, often employing

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[74]Renata Holod, "Defining an Art of Architecture", Architecture Education in the Islamic World, Singapore, 1986, p.31

[75]Allen, Five Essays..., see p.56

[76]Ibid., see p.55

[77]A. J. Lee, "Islamic Star Patterns", p.182

widely varying and sometimes arbitrary methods of layout, or even drawn more or less freehand."[78]

It remains that we still may not have enough evidence to securely adopt one or the other opinion. We do know, however, that there are several manuals, especially of the eleventh century, that focus on problem solving and which clearly express a theoretical knowledge of geometry precisely directed to facilitate the work of the craftsmen (these are going to be highlighted in chapter IV). In any case, and even if intellectual and theoretical guidance was not enough or not consistent through different ages, Islamic ornament still acquires the intellectual status of a work of art whereby it raises fundamental questions about the relationship between the visible and its meaning.

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[78]Ibid., note 4, p.195

D- SYNTHESIS [79]

POSTULATES

O NE COULD EASILY ARGUE the presence of a set of postulates within the above theoretical positions. The question of ornament is discussed within a global conception of "art as a cultural system". Ornament is accepted as an artistic medium through which we might search for functional associations and expressed meanings outside the forms themselves. Geometric abstraction is understood as a purposeful means that lends itself to more than one cultural explanation. And, finally, geometry and ornament are not to be considered merely for manual-like classifications, independent of the culture, but should rather be discussed in light of the "external" history and the intellectual mode that accompanied their social production.

Although such assumptions form somthing like an unchangeable **internal** core for the research program under consideration, yet the scholars' undertaking of them is affected by **external** factors that stem from the particularity of the Islamic context. What I am trying to hint at here is that to look at ornament as a product of a culture, brings forth the issue of the relative position of the interpreter inside or outside the culture under consideration, and the question of whether his or her judgement is grounded in the context of a specifically Islamic culture, responsible for the production of an Islamicized art and ornament, or a Western culture whose art is taken as a standard for judging any other art of a different culture. Such considerations, although they do not affect the common starting assumptions of scholars, do shape—as we shall see below—their hypotheses and methodological approaches.

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[79]See: Introduction, p.

HYPOTHESES

AROUND THE CENTRAL CORE of a cultural explanation for ornament and geometry, scholars have extended different hypotheses in order to support such an approach, and to account for various particularities of their Islamic domain of study. Since the outset of the Orientalist interest in Islamic decoration, an outsiders' view of Islam and Islamic art has been responsible for a set of hypothetical arguments concerning characteristic qualities, thought not to have been paralleled in the Western case, and every one of which demanded a specific explanation from within the 'other' culture. Among such arguments is a psychological hypothesis of a *horror vacui* and a nomadic tendency of exaggeration and lavishness introduced as justifications for a presumed 'over-decoration' and excessive surface-covering (Ettinghausen in particular). A hypothetical tendency toward unreality and illusion was also suggested as an explanation for the emphasis on planar and abstract decoration rather than three-dimensional ornament (Ettinghausen, Grabar). An interest in recalling the covering effect of textiles and rugs was again intended to provide a meaning for the peculiar application of repetitive designs (Golombek, Grabar). Besides their partial objective of being indicative of deficiencies of a different culture, such hypotheses, are more often than not, presented as extrapolations borrowed from "external" history in order to fill apparent gaps within a scholar's analysis. The frequent persistence of scholars, moreover, on these and other arguments is against their hypothetical nature based on readiness for development and change. Exceptions do exist, however, especially in the case of Grabar's contribution where theoretical adjustment is characteristic of his long research career on Islamic art and ornament. His earlier arguments departed from the notion of aniconism and emphasized arbitrariness and neutrality in ornament and geometry. Ornament was then seen as a more purposeful art based, however, on ambiguity and ambivalence. And finally, geometry was

thought of as an intermediary tool for the expression of an external purpose whether socially related, iconographic, or purely organizational.

METHODOLOGICAL RULES

THE ADDITION OF NEW HYPOTHESES, and the preservation of the central postulates, are maintained by following certain methodological directions and avoiding others that are thought not to contribute to the heuristic power of the program. The major directions are based in a multitude of disciplines including social history, art history, and general Islamic studies. In most cases the role of the historian turns to be a central one. His task becomes the concentration on the ornamental work in its contextual significance, rather than as a schematic design in a manual of ornaments. Attention would be directed to accumulated archaeological information and historical written sources that could support the dependence of artistic creativity on cultural allegiances. In the cultural program, however, bias exists towards the reliance on "external" history—including socio-economics and politics—for provision of explanations. Orientalist-based approaches, moreover, emphasize the elaboration of selected issues that seemed peculiar for an outsider, and which could easily be attributed, as I have mentioned earlier, to deficiencies within the interpreted culture. An awareness of the shortcomings of such an approach encouraged the search for alternative directions that are less grounded in rejection and antipathy, but rather based on having a closer look and a more realistic image of the Islamic culture from within. This latter direction is bound to produce less prejudiced hypotheses structured in a more accurate understanding of the role of Islam in the cultural production of art. Yet, there remains the risk of its turning to a parochial-Islamicist approach where such a role might be understood simply in terms of artistic traditions or styles of a past culture that should be revived and relived in our own time.

Chapter III

Centered at top:

C h a p t e r   I I I

GEOMETRY AND ORNAMENT
THE ESOTERIC INTERPRETATION

┌─────────────────────────┐
│   **Outline**   │
└─────────────────────────┘

A-   THE ART OF A FAITH

   1- THE ISLAMIC REVELATION AND
       ARTISTIC CREATIVITY
   2- ISLAMIZATION OF AESTHETIC CANONS

B-   UNITY AND GEOMETRY

   1- THE PRINCIPLE OF UNITY:
       ITS USE AND ABUSE
       a- The Festival of Islam and the "Nasr Circle"
       b- Geometry as a 'Uni-versal' Principle

   3- MYSTICISM AND
       COSMOLOGICAL SYMBOLISM

C-   SYNTHESIS

A LTHOUGH THE TECHNIQUES of Islamic art are thought to relate to a culture rather than a faith, it is possible to detect a pious message, according to an early argument by Grabar, where Islam "permeated, even created and compelled the techniques, forms, subjects, and settings of the Muslim world", expressing thereby "the **logical geometry of Islamic Law**" or, at other times, "the **esoteric depth of mystical imagination**".[1]

What we are dealing with in this chapter is the Islamicness of Islamic art and ornament, i.e. the relevance of Islam as a **faith** and a **spiritual way** to the artistic production of Muslims. The scholarly contributions discussed here are those which talk about Islamic art as a **sacred and esoteric art** rather than a historical/cultural phenomenon, or as an **abstract and rationable art**. I will mainly refer to works of a few Western scholars like Ettinghausen and those of Muslim scholars including Ismail Al-Faruqi and the Nasr circle.[2]

The first part is going to deal with the **relationship between the Islamic faith and the artistic production of the Muslims and its sense of aesthetics.** The question to be raised is whether the faith has limited or otherwise positively impressed the nature of the artistic work. The second part will concentrate on the extension of the religious concept of "**unity**" into the realm of art, and on the problem of pursuing esoteric meanings in Islamic ornament and geometry borrowed from the **mystical and cosmological symbolism** which was prevalent in Sufi circles. .

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[1]Grabar, "Islamic Art: Art of a Culture or Art of a Faith?", p.1
[2]Especially: Titus Burckhardt, N. Ardalan and L. Bakhtiar, Keith Critchlow, El-Said and Parman...etc.

A- THE ART OF A FAITH

1- THE ISLAMIC REVELATION AND ARTISTIC CREATIVITY

ONE OF THE COMMON Orientalist misconceptions about Islamic art was to think about the relationship between arts and the faith as a question of distinguishing an **Islamic art based on "bigotry" from that which is free of it.** On the one hand, **Islam is thought to have impeded and impoverished the artistic tendencies of the Muslim people** permitting only "the ubiquitous use of Quranic verses in Arabic which Herzfeld called "bigotry"[3] and in the breach of which—through the translation of the Quran into [other] languages—Ettinghausen saw with no little relish the beginning of the end of that monopoly".[4] On the other hand, Muslims are thought to have produced an art that was free of "bigotry", in spite of Islam, and against its teachings. Such arts are thought to include what the Muslim nobility or royalty enjoyed in their palaces be it **figurative representation** or music which "procures drunkenness and fornication".

When it comes to figural representation in particular, the central issue usually raised, in terms of the bearing of Islamic art on the Muslim faith itself, is **aniconism**, or the avoidance of the temptation of visual representation of living forms. When compared with the man-centredness of Western art or the natural complexities of Chinese art, the paucity of figural representation in Islamic art is always considered a major contributor to its uniqueness. Two scholars, Ettinghausen and Al-Faruqi,

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[3]"Writing itself..... is undoubtedly an expression of a certain bigotry on the part of the Muslims, that they inscribe nearly every article of artistic craftsmanship with some verse from the Kor'an, the confession of faith, or with innumerable, sometimes rather pointless, formulas of blessing or congratulations.....", Herzfeld, Encyclopedia of Islam, s.v. Arabesque

[4]Al-Faruqi, Tawhid: Its Implications for Thought and Life, The International Institute of Islamic Thought, 1982, pp. 236-37

elaborate on the question of representation with two different objectives in mind: the argument of the first is based on an Islam which limited artistic creativity; the second sees in the assumed limitations a unique aesthetic statement which could only manifest itself in the context of the Islamic faith.

Ettinghausen's argument in the "Character of Islamic Art"[5] relates to the question of representation and to the issue of Islamicness of Islamic art at large. He does not go so far as to distinguish between art types according to the notion of bigotry; yet, one can see the idea in the background, shining through his entire analysis. After denying any aesthetic or artistic inheritance from Arabia, **Ettinghausen** summarizes Islam's contribution to the development of Islamic art in **four major principles**. The first is the **fear of the Day of Judgement** which is thought to have made Islam "adverse to luxury". But when Ettinghausen talks of Islam's humbling spirit which looks at "the artfully made objects of daily life" as "nothing but symbols of worldly splendor, or even of ostentatious luxury..."[6], he seems to be equating luxury with artfulness and consequently implying that Islam was even **adverse to art** as such.

Ettinghausen's second principle, that of **the humanness of prophet Muhammad** (SAAS), is thought to have left "no possibility for developing a sanctified iconography of Muhammad..." and therefore "drove the Moslem artists in **entirely different directions**"[7]. But one might wonder whether it is really the lack of the representation of the prophet—lacking when compared to that of Christ and the Holy Family in the Western world—that is behind these new directions. Isn't it rather a comprehensively different

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[5]Ettinghausen, "The Character of Islamic Art", The Arab Heritage, ed. N. A. Faris, Princeton University Press, 1946, pp.251-67

    [6]Ibid., p.255

    [7]Ibid., 256

relationship between man, nature, and Divinity which shaped a unique philosophy of representation, including that of the human figure itself?

Ettinghausen's analysis of the third Islamic principle—**the submission to the all-powerful Allah**—relates to the above question. Here there is the implication that the Muslim artist's refusal to compete with the creative power of Allah resulted in a "severe **degradation of figure art**, especially painting", and in the "mechanical appearance" of the representations of three-dimensional forms in general (fig.1). The mechanical appearance
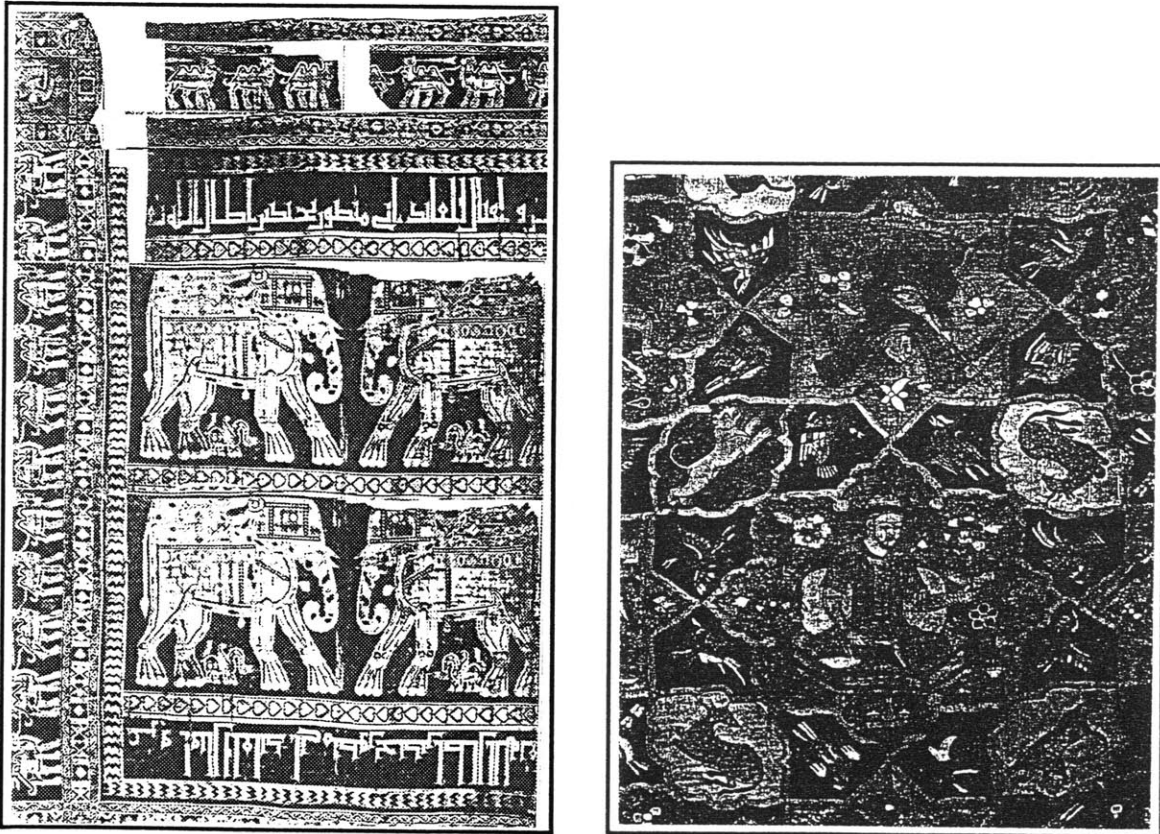
Fig.1: Silk fracments from east Iran (about 950 A.D.), Ettinghausen describes the elephant figures as flat cut-out pieces that can be moved by the manipulation of a string

Fig.2: Tapestry from Iran, 16th cent.

itself is thought to have been enhanced by a "severe juxtaposition of strongly contrasting, unnatural colors". The humble submission to the will of God

encouraged the Muslim artist to introduce the sense of **"unreality and impermanence"** whereby humble and cheap materials were used for artifacts and architectural forms which were then **camouflaged by decoration**.[8]

The decoration itself is described as "split up in a great many single units which are applied in an arbitrary fashion and could be just as well reversed or exchanged" (fig.2). This is thought to reflect **atomism**: a theological explanation of reality whereby "causal interrelations in natural events" are replaced with "a customary course of things... with arbitrary sequence."[9] Referring to the same phenomenon, Grabar describes its effect on the Muslim artist who "becomes free to recompose the units of nature he knows in any way he sees fit, and **the more arbitrary and absurd the better**."[10]

Finally, Ettinghausen addresses the art of Arabic writing as a derivation of his fourth and last principle, namely, **the unique position of Arabic Quran**. What is important to mention here is not so much Ettinghausen's views about the art of Arabic writing as an ornamental device but rather his unjustifiable position of looking at this art as "the one form which has positive qualities, and can therefore be truly called an Islamic art". According to Ettinghausen, the creative process of Islamic art is channeled into overcoming severe handicaps resulting from prohibition; for him, **every aspect of Islamic art (except for Arabic writing) was merely and simply "born out of a prohibition"**.[11]

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[8]Ibid., pp.256-60

[9]Ibid., p.262-63

[10]Grabar, The Formation of Islamic Art, Yale University Press, New Haven and London, 1987, p.192

[11]Ettinghausen, "The Character of Islamic Art", p.263

Actually, the last point regarding prohibition sums up Ettinghausen's argument about the relevance of Islam to Islamic art. The artistic achievements are reduced to "ingenious ways" of going around or finding leeway for what the Quran and the Prophet (SAAS) forbade, all motivated by the fear and avoidance of punishment. And since the representation of God and human figures was a major prohibition, the Muslim artist would resort to "entirely different directions", namely, the use of unrealistic and arbitrary ways of distorting figures and concealing forms with decoration. And, therefore, what should be addressed as a characteristically Islamic abstraction or stylization, is only seen by Ettinghausen as means opposed to the naturalistic and realistic character of much of Western art. Looking at Western art as absolute standard for all art, Ettinghausen is highlighting in Islamic art its denial and contradiction of that standard.

Challenged by many claims, like Ettinghausen's, about a severe degradation of figurative art in Islam, as compared to the Western counterpart, Al-Faruqi sets out to understand the relative positions of **man, nature and the Divine** as depicted in both arts. To take **Greek art**, with its major influence on Western art in general, one could argue, according to Al-Faruqi, that **naturalism** lies in its essence. Yet nature is not to be directly and naively imitated. Its a-priori idea, which it partially implants in all creation, is what the artist should probe, explore and represent. And since man most perfectly embodies the idea of nature, he is its most complex entelechy and his portraiture is the highest of arts. This **central role of man** led to a religion of humanism where the worship of divinity became a contemplation of man's inmost nature. Divinity itself was conceived in man's image and the whole art of Hellenic civilization reflected this essence of Hellenic culture.[12]

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[12]Al-Faruqi, Tawhid, p. 238

To the Greek approach, Al-Faruqi compares the **Near Eastern or Islamic position**. Here, there are no semigods like Prometheus; man is but an instrument of divinity created by the latter to serve and live by its norms. God's divinity, on the other hand, is a *mysterium* and is man's obsession or *idée-fixe*. **The Islamic visual art came as an expression of this aspect of culture:** the confusion of divinity with the natural and, above all, the human-natural had to be banished[13], and the human figure did not have to be aesthetically discussed. There was no need to "portray the infinitesimal shifts in human appearance expressive of human nature"[14]. **Stylization had to be implemented as a breakthrough against naturalism.**

According to Al-Faruqi's argument, **stylization** is conceived as a vehicle for the **"denaturalization** of nature" or a **"negational** instrument" for the denial of transcendence in nature; an equivalent to "Islam's vehement denial of the divinity of Christ", and to the Muslim's *shahadah* (witness) that 'there is **no** God but God'. The **aim of stylization** is not only to avoid expressing the Divine in a figure of nature because it is inexpressible, but rather to express the truth embodied in such a proposition, namely, **inexpressibility** itself.[15]

Since inexpressibility necessarily implies absoluteness and, consequently, infinity and limitlessness, stylization, therefore was not enough for the negation of naturalism, and **infinite repetition** had to be introduced. In pursuit of expressing inexpressibility, and the related attributes of infinity and limitlessness of the creator, the Muslim artist is thought to have "invented the art of decoration and transformed it into the **'arabesque'**, a non-developmental design which extends in all directions *ad*

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[13]Ibid., pp.238-39
[14]ibid., p.253
[15]Ibid., pp. 243-44

infinitum ".[16] The religious significance of "arabesque" is extended to its limits and generalized over the totality of Islamic art:

> " Properly understood, **the Arabesque is the religious work of art in Islam**. It is the Semitic religious work of art *par excellence* since it produces an aesthetic—not logical—intuition of "not-nature", of "not-finitude", and of "inexpressibility", the only intuitable categories of transcendent reality. Every work of art in Islam is a more or less successful exemplification of it."[17]

To come back to the original question of whether Islam has limited or otherwise enriched the Muslims' artistic creativity, we have seen how Ettinghausen and others have highlighted the paucity of figurative representation as a limiting factor endorsed by the faith itself, and how they have thoroughly built on the Orientalist tendency of reducing Islam to a negatively charged discipline of punishment and prohibition. Al-Faruqi, on the other hand, was keen to relate the characteristic contribution of Islamic art to the unique position of Islam itself toward the concepts of divinity and inexpressibility as compared to those of the West.[18] Al-Faruqi, nevertheless, was caught in an unnecessary reduction of all of Islamic creativity to the unitary notion of the arabesque, whereby the arabesque aesthetic principles become the aesthetics of any work of Islamic art *par excellence*.

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[16]Ibid., p.244

[17]Al-Faruqi, "On the Nature of the Work of Art in Islam", Islam and the Modern Age, Vol.1, No.2 (August 1970), p.79

[18]Al-Faruqi remarks: "The greatness of Islamic art is identically that of the religion of Islam itself, namely, *always to strive after and ever to keep the distance from the supreme, transcendent Reality*" (Al-Faruqi"s italics); Tawhid, p.265

2-   ISLAMIZATION OF AESTHETIC CANONS

A TTEMPTING TO GAIN better grounds for their arguments about an "Islamic aesthetics", scholars of Islamic art exhaust themselves in searching for some sort of starting foundation in Islamic Law and Medieval written sources. The Prophet's *hadith*: "God is beautiful and He loves beauty" is cited—almost mechanically—in nearly every discussion of Islamic aesthetics. And when it comes to Islamic philosophy, the only indication, it seems, for a parallelism between philosophy or theology and the study of beauty lies in Al-Ghazali's Alchemy of Happiness (*kimyau'l saa'dah*) and in The Revival of the Sciences of Religion (*Ihya' 'Ulum al-Din*) written around A.D. 1106 (500 H.).

One could infer from Al-Ghazali's writings that the condition for the possession of beauty is the **realization of perfection**. It is not, however, an absolute or **objective** state of perfection but rather **subjective** and characteristic of every individual thing: "...the beauty of a thing lies in the appearance of that perfection which is realizable and in accord with its nature... **The beauty of each thing lies just in its characteristic perfection.**"[19] Al-Ghazali also differentiates between two kinds of **apparent and inherent beauties**: that "of the **outer** form which is seen by the bodily eye", and that "of the **inner** form ... perceived by the eye of the 'heart'".[20] But it is the latter which really counts:

> "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 outer forms ..."[21]

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[19] H. Ritter, *Al-Ghasali. Das Elixir der Gluckseligkeit,* (Jena 1923), p.148. Cited in Ettinghausen, "al-Ghazzali on Beauty", Art and Thought, ed. K. Bharanta Iyer, London, 1947, pp.163

[20] Ibid., p.158. Cited in Ettinghausen, p.163

[21] Ibid., p.143. Cited in Ettinghausen, p.163

Al-Ghazali is obviously perceiving two levels of aesthetic comprehension: **mental and visual** (or sensual). This distinction is translated by Ettinghausen on a **religious/secular** scale: "...in spite of the strong emphasis on inner beauty and inner vision, al-Ghazzali's investigation actually reveals two approaches to art [...] one religious and the other secular."[22] It might be worthwhile to note, however, that Ettinghausen's conclusion is a hasty generalization. For although inner beauty is thought to be more essential, every believer, for Al-Ghazali, has to appreciate the outer and 'material' beauty of nature and of objects of his property which are "means for the preservation and perfection of existence"[23] and therefore are not of a 'secular' significance in the Western sense of the word.

Al-Ghazali's differentiation between visible and comprehensible beauty is adopted in the works of contemporary scholars who also draw on the symbolism of other Sufi masters like Ibn Arabi. Titus Burckhardt emphasizes the affinity in Islamic art between use and beauty, and between art and **contemplation**. The object of art is thought to be beauty of form; the object of contemplation is beauty beyond form. The outer beauty is achieved through the artistic technique (*san'ah*); the inner beauty could not be realized without the application of science (*'ilm*) which is imbued with wisdom (*hikma*). Geometry as the primary science applied by the craftsman becomes a sacred or contemplative means for the realization of an objective beauty:[24]

> "But it is in Islamic art that this 'sacred geometry' is developed with
> the greatest **inner logic** and amplitude. This means that Islamic art
> is far less a way of expressing emotion than a **science** and that a

[22]Ettinghausen, "al-Ghazzali on Beauty", p.165

[23]H. Ritter, _Al-Ghasali. Das Elixir der Gluckseligkeit_, (Jena 1923), p.148. Cited in ibid., p.162

[24]Titus Burckhardt, _Art of Islam: Language and Meaning_, World of Islam Festival Publishing Company, London, 1976, see pp.196-198

Muslim artist will willingly subordinate his individuality to the, as it were, **objective and impersonal beauty** of his work".[25]

Ardalan and Bakhtiar, in their turn, discuss the realization and aesthetic perception of a spiritual beauty within Islamic crafts. They emphasize the minor role of the individuality and subjectivity of the craftsman when compared with the realized archetypical beauty. **Originality** is understood as "the realization of an original conception, not the transitory originality of an individual's personal vanity". Beauty is thought to be objective; "its locus lies within the artifact and not within the viewer, who may or may not be receptive and capable of understanding it".[26] This is the same beauty embodied in the universal proportions of geometric patterns borrowed from nature:

> "....all shapes, surfaces, and lines are arranged in conformity with the proportions inherent in nature and reflect ideal systems of beauty. Resting on an objective foundation, independent of man and his subjective tastes, **a beauty is attained that is general, universal, and eternal.**"[27]

This universal beauty resides, according to Al-Faruqi, within the inexpressible meta-natural essence of creation. The Islamic "breakthrough in aesthetics", he thinks, is the ability to express such a fact in a formal manner; i.e. "to express sensorially the truth that God is sensorially inexpressible".[28] The vehicle for realizing such an aim was the denial of creatureliness within the represented figures through abstraction and stylization; and the medium was Divine nature—rather than human nature:

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[25]Burckhardt., "Foreword", Geometric Concepts in Islamic Art, World of Islam Festival Publishing Company Ltd, London, 1976, p.ix

[26]Ardalan and Bakhtiar, The sense of Unity: The Sufi Tradition in Persian Architecture, The University of Chicago Press, Chicago and London, 1975, see p.10

[27]Ibid., p.21

[28]Al-Faruqi, Tawhid, p.246

"By **aesthetic experience** is meant the apprehension, through what is given to sense, of an a-priori meta-natural—hence transcendent—essence... Art is the process of discovering within nature that **meta-natural essence** and representing it in visible form".[29]

Reminding us of Al-Ghazali's notion of a mental beauty perceived through 'reason', Al-Faruqi reflects, in a mystic tone, on the aesthetic comprehension of the arabesque:

"Seized by its rhythm (i.e. its symmetry and punctuated repetition) the arabesque has set the spectator in motion. In him, the demand is born for a continuation *ad infinitum* which the **imagination** is expected to furnish now that the surface has ended. The imagination does indeed comply and for a while succeeds. Soon, however, it must give up the effort, for the infinite continuation is by nature impossible. Under the imperative to continue the imagination collapses and the collapse is sweet.! For with it, it brought an **intuition of unimaginableness and inexpressibility**—in short, of infinity.[30]

The conception of an Islamic aesthetics among the scholars we have just discussed is primarily based on the notion of **duality** of beauty: inner and outer, sensible and intelligible, exoteric and esoteric, natural and meta-natural, subjective and objective, and so on. The particular notion of the duality of the outer and the inner—phenomena and the nomena—goes back to Greek philosophy and aesthetics and is not a specifically Islamic principle. The *sufi* understanding of this principle—as *zahir* and *batin*—is superimposed on the study of aesthetic principles in what appears to be an **Islamization of aesthetic canons.** It is true that a mystic authority like Al-Ghazali was aware of the concept of an esoteric beauty, yet the contemporary exaggerated mystification of the aesthetic arguments, and

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[29]Ibid., p.241

[30]Al-Faruqi, "On the Nature of the Work of Art in Islam", Islam and the Modern Age, Vol.1, No.2 (August 1970), p.78

their reduction to the notion of duality, is more the case of a contemporary scholar's response to particular insisting demands, as we are going to see below, rather than of a mystic's interpretation of aesthetics in a mystical language.

B- UNITY AND GEOMETRY

1- THE PRINCIPLE OF UNITY: ITS USE AND ABUSE

REFLECTING OB THE UNITY of Islamic art, scholars usually differentiate between, on the one hand, a geographical and chronological **variety** of motifs, materials and styles, and on the other hand, a **unity of purpose and form** that transcend the above variety.

"Islamic art embraces a whole range of styles..... although no specific style could be described as being more or less 'Islamic'; this is an example of the phenomenon of diversity in unity, or of unity in diversity, and proves indirectly that Islam is not a synthesis invented by man".[31]

For Al-Faruqi, the **unity of purpose and form** is expressed in the common characteristics of Islamic art which are thought to include "avoidance of naturalism, of characterization and development; and preference for stylization, for formalism generative of movements, for limitlessness".[32] Islam is also argued to have produced, on the aesthetic level, and out of the most diverse assemblage of cultures, "an **identical sensitivity** to the literary, visual and musical values...". Within such a unitary aesthetic comprehension, the Muslim beholder is thought to have

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[31]Burckhardt, The Art of Islam, p.117
[32]Al-Faruqi, Tawhid, p.235

subordinated his **discursive** reasoning to his immediate **intuitive** faculties.[33]

This unitary character of Islamic art, hidden behind the apparent variety of externalized forms, is conceived as a reflection of the theological principle of *tawhid*—unity of divinity. Islamic art becomes a visual vehicle for the realization of spiritual unity perceived in the mind. The artisan is thought to have realized himself and achieved "spiritual perfection" through his work of art. His goal was not to express himself but to act as an anonymous vehicle for the **realization of unity.**[34]

Arguments about the unity of Islamic art provide, from within the world view of Islam, the grounds for a discussion of Islamic art based on standards and qualities other than those of Western art. Yet, in identifying the uniqueness of Islamic art among other arts, such arguments emphasize the esoteric aspect of artistic creativity and generalize it over the totality of the art irrespective of cultural, historical, or geographic considerations. Every craftsman becomes a *sufi* and every work of art becomes a manifestation of a hidden reality. Such **reduction and generalization** can easily turn away from the arguments' religious sources into an ideological message about the **public need for esoteric knowledge.** This can be illustrated in the case of the contemporary architectural and artistic patronage of the rich Near East, where one could assert the presence of a **demand for normative and prescriptive statements about the universality of the art of the Islamic culture.** Grabar talks about an increasing acceptance of universal values (or the absence thereof) and less of a demand for cultural identification in the arts in general.[35] One might think of the example of architectural decoration, where the favoring of such

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[33]Ibid. pp. 235-36

[34]Ardalan and Bakhtiar, The Sense of Unity, p.10

[35]Grabar, "Reflections on the Study of Islamic Art", Muqarnas, Vol. 1, 1983, p.3

universal values over regional or national definitions would facilitates the utilization of skilled Moroccan craftsmen in grand architectural projects of huge financial investment all over the Middle East. The ideological message of the unity of Islamic art is also reflected in the intellectual "market" where demand increases for more prescriptive exhibitions and publications (as we have seen in chapter I). The best example to be given here is the Festival of Islam[36] and its subsequent publications, where the concept of unity and the reduction into geometry were greatly applauded by the general public, students, and the intellectual/academic circles, and, at the same time, satisfied the thirst for **mystery and exoticism** on the part of the West in particular.

a- The 'Festival of Islam' and the 'Nasr Circle'

THE DECLARED OBJECTIVE of the Festival of Islam was to "present the **totality** of the Islamic culture and civilization", with the aim of attributing to them simple and timely definitions that distinguish them from other cultures. The Festival director writes:

> "The Festival represents a unique collaboration between scholars, institutions and governments from both the Islamic world and the West, and such a participation is bound to have a **permanent effect on our knowledge of Islamic culture**, as the very act of attempting to see something in a **complete** way leads us towards a **definition which could well serve as a model for our time.**"[37]

But in order to to "see something in a complete way" or to pursue simplified definitions and timely models, the Festival was drawn into **methodological and ideological pitfalls** especially apparent in the few

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[36]The Festival of Islam was held all over Britain and particularly in London during the spring and summer of 1976

[37]Paul Keeler, "Preface", The Arts of Islam, The Arts Council of Great Britain, 1976, p.18

handsome Festival publications of S. H. Nasr, Titus Burckhardt, El-Said and Parman, and others[38], who belong to the group of scholars that I shall refer to as the "Nasr circle". First there is the reluctance to deal with history and the insistence on the universality of the tradition:

> "The need had arisen for normative and prescriptive statements about the art of a culture in history, no longer for interpretations of the history of an artistic tradition".[39]

The second issue is the preaching of a set of esoteric **principles** or characteristics that are thought to lie at the **essence** of any definition, description, or judgement of Islamic art. The problem is not with the search for principles or with relating them to the Islamic revelation, it has rather to do with the claim about their **exclusivity**, and the **lack of their socio-cultural justification** as universal aesthetic canons.[40] In one of the exhibitions related to the Festival (at the Hayward Gallery), the role of the above principles was apparent in the grouping of objects according to categories based on implied aesthetic judgements of Islamic art, rather than on traditional chronological, geographical, or technical ways of ordering.[41] The inherent principles, however, were mostly reflected in the publications of the "Nasr circle", especially those related to geometry, to which a complete book was dedicated.

Apart from methodological problems, the Festival and its publications were formulating an ideological message about the unity of Islamic art:

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[38]The most important ones are Nasr's Islamic Science, Burckhardt's The Art of Islam, Language and Meaning, and El-Said and Parman's Geometric Concepts in Islamic Art (all London 1976)

[39]Grabar, "Geometry and Ideology: The Festival of Islam and the Study of Islamic Art", A Way Prepared: Essays on Islamic Culture in Honor of Richard Bayly Winder, ed. Farhad Kazemi and R. D. McChesney, New York University Press, p.150

[40]Ibid. see pp.148-149

[41]Ibid., see pp.147-148

"By a fascinating sleight of hand, the profoundly Islamic theological notion of *tawhid*, of the absolute oneness of God, was transferred not only to the community, the *ummah*, but also to the objects and buildings sponsored and used by the community of Muslims. To the single message of a unique Divine Revelation there corresponds a visually perceptible artistic creativity of comparable unity. And the identification of the principles which create that unity acquire automatically a culturally normative value".[42]

b-   Geometry as a 'Uni-versal' Principle

HERE WE WILL BE DEALING with the reduction of Islamic artistic creativity to the notion of a "uni-versal" geometry understood as a manifestation of the theological principle of unity (uni) in variety (verse). The geometric principle and the endless variation of its design applications becomes a metaphor for the presence of the divine principle within the multiplicity of creation. Al-Faruqi, for example, considers that the common constitutive characteristics of Islamic art, which are thought to be behind its aspect of "unity", are best expressed in one branch of Islamic art, namely the geometry of the arabesque, until there comes a point where *arabesque* turns to be the actual **"essence"** of **"Arab consciousness" and Islamic creativity** as such. It attains **a universal quality** where every facet of creative art, including the Arabic language, literary arts, Arabic poetry, architecture, and calligraphy, becomes itself an *arabesque* [43]: Elaborating on the last two cases Al-Faruqi remarks:

" ..... the Muslim artist..... developed the Arabic script so as to make of it an infinite arabesque extending nondevelopmentally in any direction the calligrapher chooses. The same is true of the Muslim architect whose building is an arabesque in its facade, elevations, skyline, as well as floor plan."[44]

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[42]Ibid., p.150
[43]See Al-Faruqi, Tawhid, pp.245-51
[44]Ibid., p.245

Al-Faruqi actually talks of a "basic geometry of the Arabic language and of Arabic poetry". The application of the geometric principles in endless patterns is compared to the logical structure of the Arabic language which is made up of infinite conjugations of three-consonant roots based on known patterns of conjugation. Infinite extendibility in geometric patterns and the extendibility and repetition in Arabic poetry are also seen as one and the same.[45]

Now moving to the "Nasr Circle", the argument remains basically the same. S. H. Nasr himself considers that "Islamic art is **essentially** a way of ennobling matter by means of geometric and floral patterns **united** by calligraphic forms....."[46] Ardalan and Bakhtiar summarize man's artistic abilities in the creation of symmetrical or geometric forms, rhythmical patterns, or a harmonization of both.[47] Even within the more scientific and mathematical attempts at revealing the implicit geometric order within ornamental patterns, and the consequent establishment of generative methods and theories, the unique position of geometry and its reflection of "unity" is no less apparent. El-Said and Parman's argument, for example, in Geometric Concepts in Islamic Art, is also based on the notion of the universal application of geometry. Their major aim, as they express it in the conclusion, is to illustrate "the adoption and the application of a **geometrical method as a unifying basis to diverse fields of self-expression**"[48]. They actually suggest that a common geometric method have been used not only for the decorative and architectural arts of Islam,

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[45]Ibid., see pp.248-251

[46]S. H. Nasr, "Foreword", in Islamic Patterns: An Analytical and Cosmological Approach, Kieth Critchlow, Schocken Books, London, 1976, p.6

[47]Ardalan and Bakhtiar, The Sense of Unity, p.6

[48]El-Said and Parman, Geometric Concepts in Islamic Art, World of Islam Festival Publishing Company Ltd, London, 1976, p.153

but also in the writing of Arabic calligraphy (*khatt*), the making of Arabic poetry (*arud*), and the composition of classical Arabic music.

Fig.3: Construction of different Arabic letters according to the system of "noble proportion" (nisbah fadilah) derived from Ibn Muqlah as outlined by Ikhwan Al-Safa'
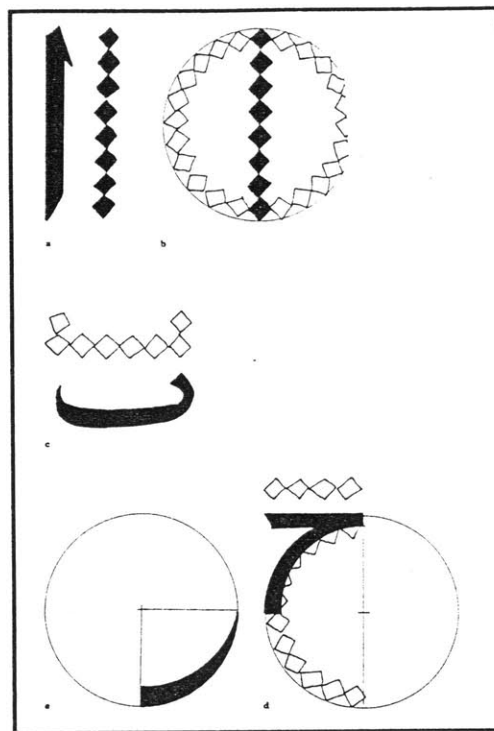
They discuss a geometric method which was used for the construction of **Arabic calligraphy**. As in the construction of geometric ornament based on proportions and generative units, the art of calligraphy is also generated from a basic unit—namely the length of the first alphabet (*alef*), and on the ratio of its thickness to its length[49] (fig. 3). In **poetry**, the basic structure is based on sixteen different meter types or phonetic patterns, six or eight "verbal units" within each line, and a number of "sub-units" made of vowels and consonants within each "verbal unit". The principals of a repeat unit and proportioning systems within ornamental patterns are extended again to the discipline of poetry.

"The construction of the meter or phonetic pattern for a line of verse from vowels and consonants combined in definite proportion or

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[49]Ibid., see p.130

sequence by the use of the same or two different types of verbal units, is compatible to the construction of a particular master grid and hence to the repeat pattern of a design from constituent polygonal units positioned at definite angles to each other by the use of equal or proportional segments of the circumscribing circle. In other words the same concept determines the making of rhythm in space or rhythm in time."[50] (fig. 4)
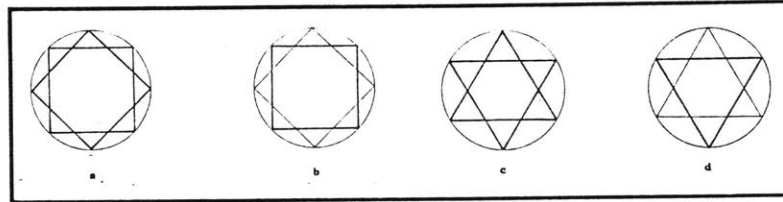
Fig.4: The construction of phonetic patterns in Arabic poetry is compared to the construction of the repeat patterns on the master grids of ornamental designs: (a) stands for Mutaqarib and Mutadarik meters; (b) for Tawil and Basit; (c) for Raml and Kamil; and (d) for Khafif

Contemporary scholars, as we have seen, are exhausting themselves for the sake of deriving an **archetypical system** behind the various facets of Islamic artistic creativity. Such a system *has* to be **one and only one**, otherwise it would refute the hypothesis of its reflection of the theological concept of unity. Geometry as a universal principle would happily match the oneness of a generative system. It is also an easily accessible and a widely acceptable medium for the general public. I am not doubting the essential role of geometry in the Islamic visual arts, I am rather being skeptical about its introduction as a principle which engulfs, or even replaces, all other principles of harmony, proportion, rhythm, and melody, in the literary arts in particular. The principles of Arabic poetry, for example, do not have to be geometricized in order for poetry to fulfill its creative role. Arabic poetry, also, does not have to be based on a single archetypical system in order to be more Islamic in its reflection of *tawhid*.

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[50]Ibid., see pp.135-136

2-   MYSTICISM AND COSMOLOGICAL SYMBOLISM

T HE MOST INTERESTING ASPECT of the study of Islamic and especially Persian mysticism, for our purposes, is the **extension of the traditional theological and esoteric symbolism of mystical thought into science and art**. Mystical studies like those of Hellmut Ritter, Henri Corbin and Annemarie Schimmel are extended by the "Nasr circle" into **science** and technology (S.H. Nasr, Islamic Science, London, 1976), **art** (T. Burckhardt, Art of Islam, London 1976, and S. H. Nasr, Islamic Art and Spirituality, New York, 1987), **architecture** (N. Ardalan and L. Bakhtiar, The Sense of Unity, Chicago, 1973) and **geometric patterns** (K. Critchlow, Islamic Patterns, London, 1976).

In Islamic Art and Spirituality, S. H. Nasr calls for the study of the nature and origin of Islamic art from within "the world view of Islam". Insisting on the relation between Islamic art and the inner spiritual dimension of the Islamic revelation, Nasr **criticizes the supporters of the socio-cultural position:**

> "Some might concede such a relationship but seek the origin of Islamic art in the socio-political conditions created by Islam. This view is a thoroughly modern and non-Islamic one, even if now emulated by certain Muslims, for it sees the origin of the inward in the outward and reduces sacred art with its interiorizing power to simply external, social and, in the case of Marxist historians, economic conditions."[51]

Nasr also excludes the rationalistic explanation of the intellectual character of Islamic art. Intellectuality and spirituality are inseparable, and the **scientific knowledge utilized in Islamic art is grounded in wisdom** or *hikma* which is an aspect of spirituality itself:

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[51]Nasr, Islamic Art and Spirituality, State University of New York Press, Albany, 1987, p.4

" The undeniable intellectual character of Islamic art is not the fruit of a kind of rationalism but of an intellectual vision of the archetypes of the terrestrial world... Islamic art does not imitate the outward forms of nature but reflects their principles. It is based upon a science which is not the fruit of either ratiocination or empiricism but a *scientia sacra* which is attainable only by virtue of the means provided by the tradition".[52]

Esoterically understood, geometric **abstraction** itself is thought to transcend purely mathematical abstraction into archetypes and spiritual realities "of which the so-called realities of this world are nothing but shadows and abstractions":

"The process of so-called 'abstraction' in Islamic art is, therefore, not at all a purely human and rationalistic process as in modern abstract art, but the fruit of intellection in its original sense, or vision of the spiritual world, and an ennobling of matter by recourse to the principles which descend from the higher levels of cosmic and ultimately Metacosmic Reality".[53]

This process of intellection is thought to be maintained through symbolism. A cosmological symbolic system based on an esoteric interpretation of symbolic forms is claimed in a few contemporary works that developed, as I have mentioned earlier, from an **extension of mystical thought** into art and geometric ornament in particular. Burckhardt considers that the symbolic is "the direct and nondiscursive manifestation of a spiritual reality...", and that "symbolism always refers to the fundamental idea of Islam, the idea of divine unity".[54] In Sufism, a parallelism is usually made in mystical thought between ordinary

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[52]Ibid., pp.8-9

[53]S. H. Nasr, "Foreword", Art of Islam: Language and Meaning, Titus Burckhardt, World of Islam Festival Publishing Company, London, 1976

[54]Burckhardt, comments on part 1:"Form, a Vocabulary and Grammar of Symbols", Architecture as Symbol and Self-Identity, The Aga Khan Awards, Philadelphia, 1980, pp.36-37

language which reflects the knowledge perceived directly through the senses and acquired mentally through reason, and, on the other hand, the **language of symbolism** which expresses the spiritual knowledge (gnosis) internalized through the intellect. The object of the intellect is *ta'weel* or the contemplative interpretation of symbols. *Ta'weel* is conceived as "**the bridge between the exoteric and the esoteric**", it is the vehicle of transcending the **outer visible form** of things *(zahir)* to the **inner symbolic meaning of the original archetype** *(batin)*.[55] To quote Al-Ghazali:

> "The visible world was made to correspond to the world invisible and there is nothing in this world but is a symbol of something in that other world".[56]

The symbolic source of works of art are thought to exist in **nature** and its inherent systems of **order** "that are **symmetrical or rhythmical**, or both".[57] **Mathematics**, as the abstraction of the Laws of Nature, is the medium for the manifestation of the "Divine Order" in our physical world. Order and proportion are viewed as "cosmic laws whose processes man undertakes to comprehend through arithmetic, geometry, and harmony".[58] **Geometry and numbers**, as mathematical expressions, are given a qualitative and symbolic dimension (fig.5):

> "Geometric forms and numbers are not just what they appear to be quantitatively. They have a qualitative and symbolic aspect... Each number and figure, when seen in its symbolic sense, is an echo of Unity and a reflection of a quality contained in principle within that Unity..."[59]

[55]Ardalan and Bakhtiar, The Sense of Unity, p.5

[56]Abu Hamid Muhammad Al-Ghazali, The Revival of the Sciences of Religion (*Ihya' 'Ulum al-Din*), cited in Margaret Smith, Al-Ghazzali the Mystic, p.111

[57]Opcit., see pp.5-6

[58]Ardalan and Bakhtiar, The Sense of Unity, p.21

[59]S.H. Nasr, "Foreword", The Sense of Unity, p.xiii

Number	Geometry Static	Geometry Dynamic	MACROCOSM		MICROCOSM		MATHEMATICAL ATTRIBUTES
0			Divine Essence		Divine Essence		
1			Creator	One Primordial Permanent Eternal	Creator	One Primordial Permanent Eternal	The point / The principle and origin of all numbers
2			Intellect	Innate Acquired	Body divided into two parts	Left Right	One-half of all numbers are counted by it
3			Soul	Vegetative Animal Rational	Constitution of animals	Two extremities and a middle	Harmony / First odd number / One-third of all numbers are counted by it
4			Matter	Original Physical Universal Artifacts	Four humors	Phlegm Blood Yellow bile Black bile	Stability / First square number
5			Nature	Ether Fire Air Water Earth	Five senses	Sight Hearing Touch Taste Smell	First circular number
6			Body	Above Below Front Back Right Left	Six powers of motion in six directions	Up, down, front, back, left, right	First complete number / The number of surfaces of a cube
7			Universe	Seven visible planets and seven days of the week	Active powers	Attraction Sustenance Digestion Repulsion Nutrition Growth Formation	First perfect number
8			Qualities	Cold, dry Cold, wet Hot, wet Hot, dry	Qualities	Cold, dry Cold, wet Hot, wet Hot, dry	First cubic number and the number of musical notes
9			Beings of this world	Mineral Plant Animal (Each containing three parts)	Nine elements of the body	Bones, brain, nerves, veins, blood, flesh, skin, nails, hair	First odd square and last of single digits
10			The Holy Tetractys	First four universal Beings	Basic disposition of the body	Head, neck, chest, belly, abdomen, thoracic cavity, pelvic girdle, two thighs, two legs, two feet	Perfect number / First of two-digit numbers
12			Zodiac Aries, Leo, Saggitarius Taurus, Virgo, Capricorn Gemini, Libra, Aquarius Cancer, Scorpio, Pisces	Fire, hot, dry, east Earth, cold, dry, south Air, hot, wet, west Water, cold, wet, north	Twelve orifices of the body	Two eyes, two nostrils, two ears, two nipples, one mouth, one navel, two channels of excretion	First excessive number
28			Stations of the Moon (divided into four quarters)	Each quarter equals one week, seven days represent seven planets	Twenty-eight vertebrae		Second complete number
360			Number of solar days		Number of veins in the body		Number of degrees in a circle

Fig.5: Symbolism of numbers and geometric shapes. Table from The Sense of Unity *by Ardalan and Bakhtiar, based on the cosmology of Ikhwan Al-Safa' as described in S. H. Nasr:* An Introduction to Islamic Cosmological Doctrines

Geometry as the "the expression of the 'personality' of numbers" allows each geometric shape to be seen in its symbolic sense (fig.5). The triangle is the first form to enclose space in the generation of points or lines from (1); it represents the action of the intellect (2) on the soul (3).[60] The square is the symbol of stability and the reflection of the temple of paradise. The octagonal form is the reflection of the Divine Throne (arch) supported by eight

[60]Opcit., p.27

angels.[61] And the pentagon star is argued to be related to a religious and cosmological significance of the number 5, whereby much effort is spent in the citation of occurrences of the number 5 as in Islam's "five pillars", the daily five prayers, or the "five states of beings or presences".[62]

The symbolism of The concept of geometric patterns is thought to be "based on the number 1 and its generation in the world". On roofs patterns tend to be circular, with centripetal lines symbolic of the cosmos; on walls they relate to the resolution of the circle to the square, symbolizing the transcendence of soul to spirit; and on floors they are predominantly square, symbolic of the earth itself.[63]

Art forms are finally seen as visual expressions of spiritual stages of psychological participation within the mystic's journey. Arabesques are thought to correspond to spiritual "states"; geometric forms to "stations"; and arabesque and geometric calligraphy to "presences"[64]. **Spiritual "states"** (*ahwal*) are never permanent. They are "instantaneous successions and alterations reflecting a transient spiritual mood"[65]. In their succession and alteration they satisfy the demands of **symmetry and rhythm**, and like musical notes, they visually correspond to the profusion of rhythms by the arabesque. The moment of encounter of the spiritual "state" (*waqt*) is compared to the **center** of the arabesque, the enduring stabilization of the "state" (*tamkin*) to the **symmetrical** stabilization of the arabesque's spirals, and the alternating transition from one "state" to another (*talwin*) to the **alternating repetition** in the arabesque (fig.6).
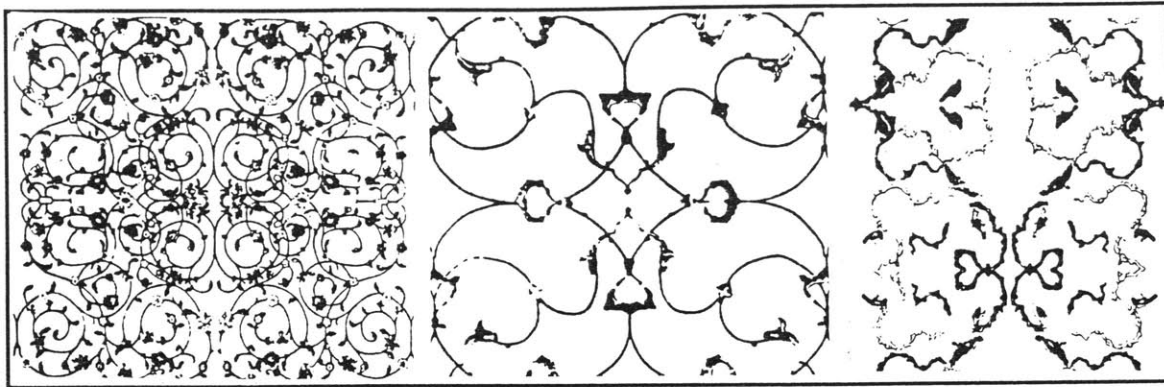
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[61]Opcit.

[62]A.A. Sultan, "Notes on the Divine Proportions in Islamic Architecture", in Process: Architecture, No. 15, May 1980, p.152
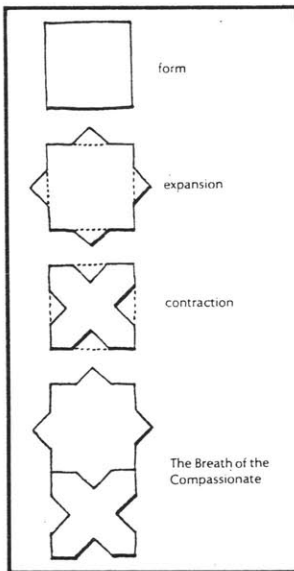
[63]Ardalan and Bakhtiar, The Sense of Unity, see pp.41-44

[64]Laleh Bakhtiar, Sufi Expressions of the Mystic Quest, Thames and Hudson, London, 1976, see pp.98-105
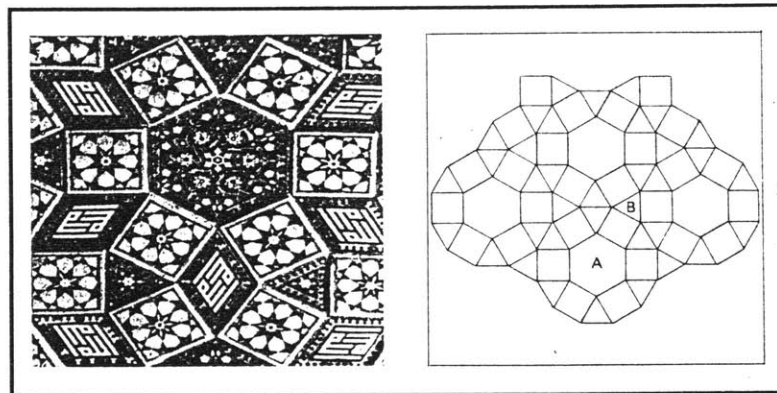
[65]Ibid., p.98

Fig.6: The arabesque as a symbol of a spiritual "state"
centrality, symmetry, and alternation

Fig.7: (Left) Expansion and
contraction of geometric forms

Fig.8: (Below) Gathering (A) and separation (B)

Spiritual "stations"[66] are permanent acquisitions. They are manifested in inseparable and complementary pairs between which the mystic constantly moves: contraction/expansion (*qabd / bast*) (fig.7); gathering/separation (*jam' / tafriqah*) (fig.8); sobriety/intoxication (*sahw / sukr*)... etc. In their duality they correspond to static and dynamic geometry. The "stations" are fulfilled only through the conjunction of their opposites which in turn will yield a new "station". Similarly, "static" and

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[66]Ibid., see pp.100-102

"dynamic"—or "passive" and "active"—geometric forms unite in order to generate a third complementary form (fig.9). Their transformation is either inward or outward (fig.10).
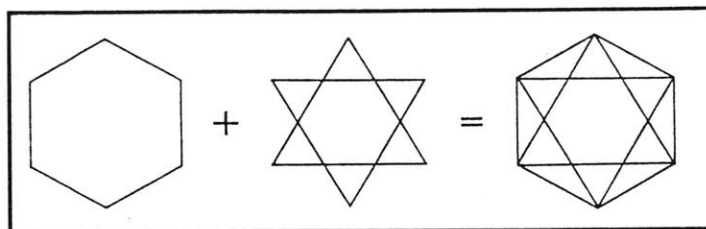
Fig.9: Passive form + active form = complete form
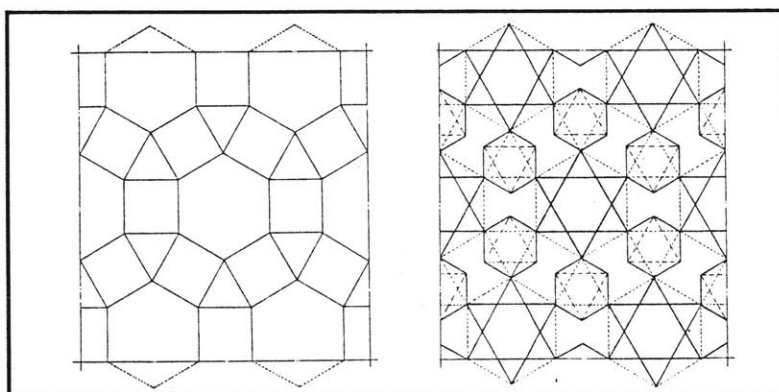
Fig.10: Dynamic transformation of geometric forms: inward and outward generation

One problem to be raised regarding these esoteric meanings, given for the different aspects of Islamic geometric ornament, is that different—sometimes contradictory—symbolic meanings are given to similar ornamental types or geometric shapes so that one would wonder which of those alternatives was actually used or preferred, or would alternatively place the arguments within the realm of personal and poeticized speculations. The major objection, however, relates to the question of whether the symbolic system of the *sufis'* cosmology (especially in the case of Bakhtiar's analogies) was assimilated within the artisans' creative process, or even whether it was actually known to the artisans' groups in the first place. Even within the Muslim community at large, it might be argued historically that:

"...there does not exist... a single instance justifying the opinions that the Muslim community, the ummah, as opposed to individual thinkers, understood mathematical forms as symbolizing or illustrating a Muslim cosmology".[67]

C- SYNTHESIS

POSTULATES

T HE CENTRAL ARGUMENT of this research program is that any discussion of the artistic production of Muslims, including its design principles, aesthetic qualities, or the meanings behind its forms, has to be based on its relationship to Islam itself. The pursued relevance of Islam is considered either vis-a-vis its prescriptive power as a faith centered on its revealed Law, or as a spiritual Way based on a cosmological symbolism. The assumption in the first case is that the artistic creativity of the Muslim believer was actually shaped by the Islamic Law whether limited by its prohibition of figurative representation, or enhanced through the provision of alternative creative means of stylization and geometric abstraction. The assumption of the second case is that by virtue of its spiritual nature, Islamic art is a sacred esoteric art whose meanings are derived from mystical interpretations of the cosmos and the natural order, rather than from historical/cultural considerations, or from an abstraction which is an end in itself.

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[67]Grabar, "The Mediation of Geometry", <u>Introductory Demons Toward a Theory of Ornament</u>, A. W. Mellon Lectures in the Fine Arts (unpublished draft), 1989, p.23

HYPOTHESES

FOR EVERY ASSUMPTION within the religious/esoteric approach, scholars have arrived at different hypotheses that elicit criticism. We have seen how some contemporary scholars build their discussion of the Islamicness of art on the prejudiced Orientalist differentiation between an art of bigotry and that free of it. Ettinghausen also based his arguments about the character of Islamic art on the presence or absence of prohibition relative to different facets of the art, which in turn led him to hypothesize a degradation in Islamic figurative art, and an unreality and contradiction in the decorative art. Al-Faruqi argued, on the other hand, that the nature of abstraction in figurative and decorative arts were part of the creative genius of Islam rather than a result of fear of punishment for violating prohibition.

The central hypothesis remains, however, that the meanings and aesthetic principles of Islamic art should be primarily conceived as visual externalizations of the theological principle of unity based on the duality of oneness (of the creator) and multiplicity (of the physical world). The artistic aesthetic principles themselves—as manifestations of that unity—cannot but follow the same system: that of a dual differentiation between an outer subjective beauty and an inner objective one. The search for one archetypical principle that could easily explain the unity behind the variety of artistic expressions has led, moreover, to the hypothesis of a universal principle of geometry. Geometry became the secret power behind all forms of realization of unity including calligraphic design and Arabic poetry.

The extensive use of geometry, and the universality of its mathematical laws, are thought to stand as a metaphor for the all-pervasive presence of God in all of human creation. The endless variations produced from the same geometric forms are also perceived as symbolizing the visual versions of the multiple qualities of God. What is stressed in all cases is that

arbitrary but modular signs are intended to express **deep esoteric meanings rather than ideographic borrowings** from the world of nature. Geometry is finally given a more mystical mode by attributing to it a series of hypotheses about its relationship to the cosmology of numbers and shapes, and to the symbolism of the sufi's journey of ascent towards unity.

METHODOLOGICAL RULES

T HE ESOTERIC INTERPRETATION builds on its rejection of cultural, historical, and economical factors as primary concerns in an Islamic art. The argument is that such considerations ignore the spiritual dimension of the creative process. There is also the rejection of the notion of an abstract art in the modern sense of the word. Abstraction is seen not as a rationalizing or reductive process of a purely mathematical nature, but rather as an unfolding of archetypical symbols and principals.

The major methodological guideline is the discussion of Islamic art from within the world view of the Islamic faith. This has led to the reliance on theology and other religious and traditional sciences. The primary source is the Islamic Law manifested in the Quran and *hadith*. Secondary sources came from traditional sciences and sufi interpretations of the primary sources—especially from the sufism of Ibn Arabi, and the cosmology of Ikhwan Al-Safa (the Brethren of Purity), In most cases, however, the all-encompassing world view of Islam on which hypotheses are claimed to be based, is narrowed down to a spiritual discipline centered around the concept of the *batin* or the esoteric. Scholars who are pursuing an esoteric interpretation, moreover, are basing their arguments on the European assimilation of the sufi sciences and cosmologies which emphasize the mystic dimension of sufism. And, finally, while the Western interest in sufism cannot be detached from the old Orientalist notion of an

exotic East, the corresponding concern of many Muslim scholars is strongly related to the contemporary Islamicist tendencies which emphasize the reduction of Islamic art into a number of easily revivable principles.

Chapter   I V

GEOMETRY AND ORNAMENT
THE POSITIVISTIC APPROACH

Outline

A- PERCEIVING ISLAMIC ORNAMENT: THEORIES AND METHODS

1- RATIONALIZING ISLAMIC ORNAMENT: CLASSIFICATION AND TYPOLOGY
2- VISUAL TENSION AND PART/WHOLE AESTHETICS

B- THE SEARCH FOR DESIGN THEORIES BASED ON GEOMETRY

1- GEOMETRIC ORNAMENT AND TRADITIONAL MATHEMATICS
2- LOOKING FOR GENERATIVE DESIGN PRINCIPLES

C- APPLYING CRYSTALLOGRAPHIC THEORIES

D- SYNTHESIS

A LTHOUGH MUCH WORK has been done by Orientalist scholars on geometric patterns in the second half of the nineteenth century (Owen Jones, J. Bourgoin...), it is mostly in the last few decades that the contemporary concern with pure design has led many observers back to a serious rationalistic study of ornament and its possible design methods. Islamic ornament was, and is still, given a particular attention due to the additional factor of growing revivalist tendencies.[1]

The first part of this chapter addresses the contemporary rationalistic research and highlights its differences from the cultural and religious approaches. It will analyze alternative methods of **perceiving** ornamental designs in terms of types, vocabulary, or abstract geometric properties. The discussion will also investigate various **aesthetic** hypotheses that deal with a formalistic **part/whole** relationship. In the second part, I discuss different theories which address the actual design of ornamental patterns and their **generative methods**. I emphasize their relationship to **traditional mathematics,** and their extension or generalization onto the field of **architecture**. In the third section, both the perception and generation of patterns are discussed in terms of **crystallographic theories**.

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[1]In this respect, the situation is comparable with the Orientalist interest in the design principles of Islamic ornament during the period of revivalism and the search for new and rational styles in nineteenth century Europe (see chapter I).

A-	PERCEIVING ISLAMIC ORNAMENT:
	THEORIES AND METHODS

1-   RATIONALIZING ISLAMIC ORNAMENT: CLASSIFICATION AND TYPOLOGY

T HERE HAVE ALWAYS BEEN ATTEMPTS, within a scholarly interest in ornament as an autonomous discipline, to organize, categorize, or classify the historical body of ornament into different groups according to type of motif, degree of geometrizing, compositional methods thought to have been followed by the craftsman, or material-related techniques.

Organizing ornament of the Islamic world into categories based on the different material-related techniques (stucco, stone, mosaic, ceramic, wood...) falls within a socioeconomic approach rather than a **non-contextual classification** of ornamental designs with which this chapter is concerned. One reason, Grabar thinks, that may justify the study of ornament as ornament **regardless of technique**, is the "demonstrably numerous attempts by early Islam to transfer effects from one technique to the other". Another reason is the flexibility of some popular techniques like stucco which, by nature, provided the opportunity of exploring a multitude of forms and motifs to such an extent that the variety of its possible applications could be studied independently of its technical limitations.[2]

One way of rationalizing the discipline of ornament, away from its immediate physical and technical context, is through classification of

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[2]See Oleg Grabar, The Formation of Islamic Art, Yale University Press, New Haven and London, 1987, pp.182-84

ornamental motifs into **vegetal, geometric** or those which combine both characteristics. According to Al-Faruqi:

> "Arabesques are floral or geometric, depending on whether they use the **stalk-leaf-flower** *(tawriq)*, or the **geometric figure** *(rasm)* as artistic medium. The geometric figure can be **linear** (khatt) if it uses straight and broken lines, or **trajectory** (rami) if it uses multicentered curved ones. It might also combine all these together and be called then (rakhwi). Arabesques are **planar** if they have two dimensions, as most decorative ones...... They can also be **spatial**, or three-dimensional, constructed with pillars and arches and the ribs of domes."[3]

Al-Faruqi's classification of ornamental arabesques follows the original and technical Arabic nomenclature commonly used among craftsmen[4]. The Arabic terms distinguish between geometric and vegetal designs and between secondary types of geometric applications. Al-Faruqi adds to these his differentiation between methods of surface or spatial application.

Other analyses are based on compositional schemes thought to have been applied by artisans. In The Taming of the Horror Vacui, Ettinghausen's classification revolves around the principal **methods of filling space** with decorative patterns which he thinks are determined by the **notion of** *horror vacui*.. He differentiates between three major systems of creating "a dense composition" with varying **design-background relationships**. His proposed "organizing schemes" are thought to have been applied by the artisans who "handled the extensive combinations of patterns

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[3]Ismail Al-Faruqi, Tawhid: Its Implications for Thought and Life, The International Institute of Islamic Thought, 1982, pp.257-58

[4]For a wider knowledge of the vocabulary used by craftsmen (at least present-day Moroccan master-craftsmen), see André Paccard, Traditional Islamic Craft in Moroccan Architecture, Trans. by Mary Guggenheim, Editions Ateliers 74, France, 1980, Vol.1. Paccard elaborates on the Arabic nomenclature ascribed to different grids, border and knot designs, individual vegetal motifs, and motif combinations.

so as to avoid bare areas which, it seems, were aesthetically unsatisfactory."[5]
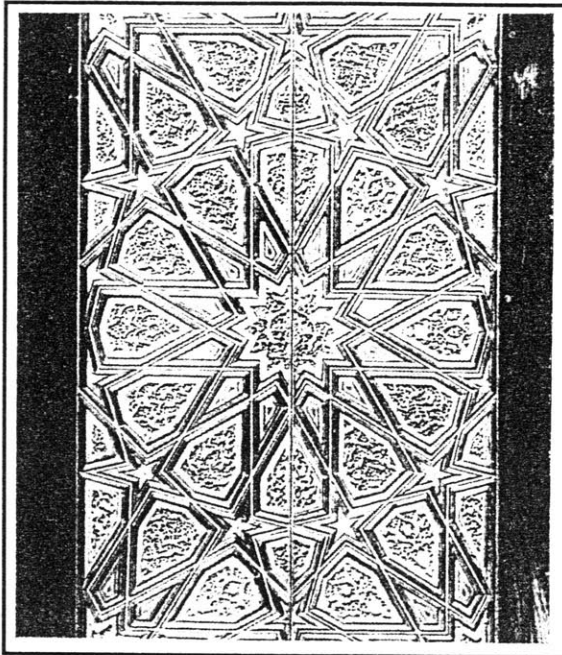
Fig.1: Wooden door inlaid with ivory. Egypt, probably first half of fourteenth century
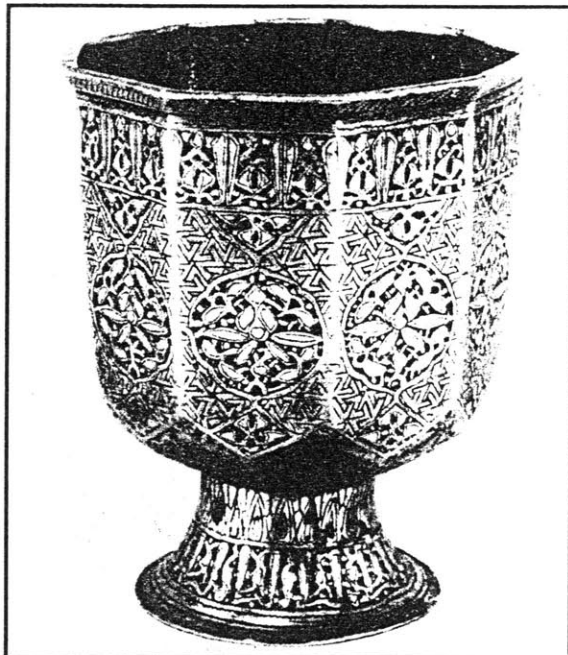
Fig.2: Brass cup inlaid with silver. Iran, second half of fourteenth century

The first scheme is essentially made up of a prominent **"skeletal" configuration, of either a geometric** (fig.1) **or a curvilinear outline** (Fig.2), extending a rigid structure onto the field in which it is placed. The rest of the internal and external areas are then filled with other patterns on a smaller scale, thus leaving almost no background and turning the negative field positive.[6] The second group is dedicated, according to Ettinghausen, to a complete surface coverage. It is made up of **sinuous line patterns spread in a uniform and abstract nature** leaving no difference between design and background (Fig.3). Ettinghausen also identifies a third method of developing a **repeat pattern which covers the field in a tile-like fashion,**
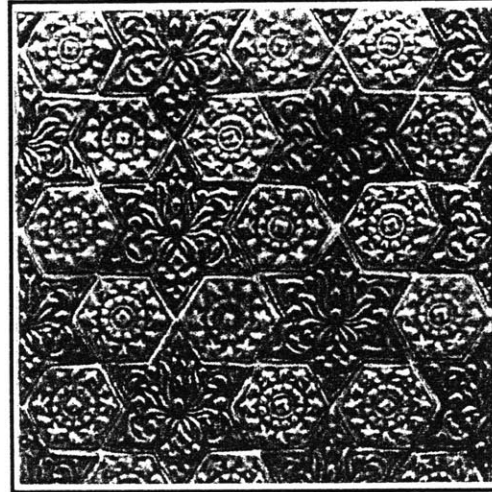
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[5]Ettinghausen,"The Taming of the Horror Vacui in Islamic Art", <u>Proceedings of the American Philosophical Society</u>, Vol. 123, No.1 (Feb. 1979), p.15

[6]Ibid., p.16
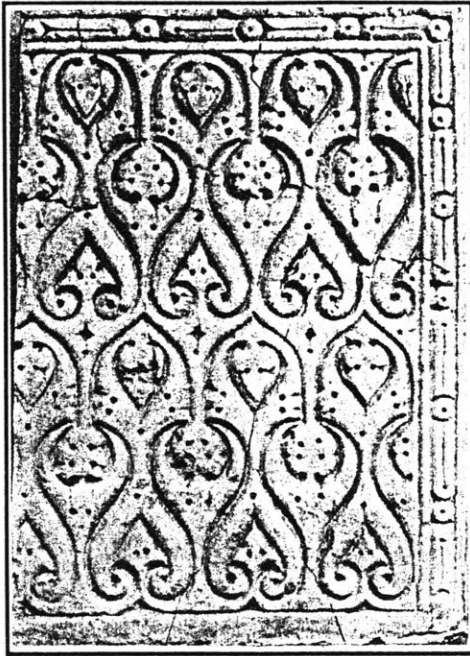
*Fig.3: Stucco cast, Samarra, Iraq; ninth century*

Fig.4: Tile pattern, Iran, probably Nishapur; late thirteenth/fourteenth century

and is itself filled in with other designs, unit by unit (fig.4). A **separating frame**, which in turn can carry a minor decoration, might be added to help distinguish the geometric framework from the filler designs. What Ettinghausen is describing here is actually nothing but a special case of his first "skeletal" scheme. Even the "separating frame", which he tries to introduce as a new element of the third method, is again a property of the first group. If this points to anything, it is the distance of Ettinghausen's analysis from a reliable rationalistic account of decorative schemes, and his preoccupation with the arguably overriding psychological intentions of the artisan as a basis for classification.

In an attempt to define the arabesque, Allen differentiates between various ways of combining vegetal ornamentation with a geometric framework which remind us of Ettinghausen's "organizing schemes". But whereas modes of space filling constitute Ettinghausen's major criteria for classification, Allen's primary concern, on the other hand, lies in the **historical development of the problem of "assimilation of vegetation to**

geometry". He distinguishes between different stages of growing complexity that lead ultimately to the mature arabesque. First came the ornamental type that had "axial correspondence or symmetry" and was based on **"complex geometric frameworks"** (fig.5). Then we have the "juxtaposition of geometry with vegetation" whereby **foliate fragments including the grape vine were "compartmentalized in geometric frames"** (fig.6). A later stage
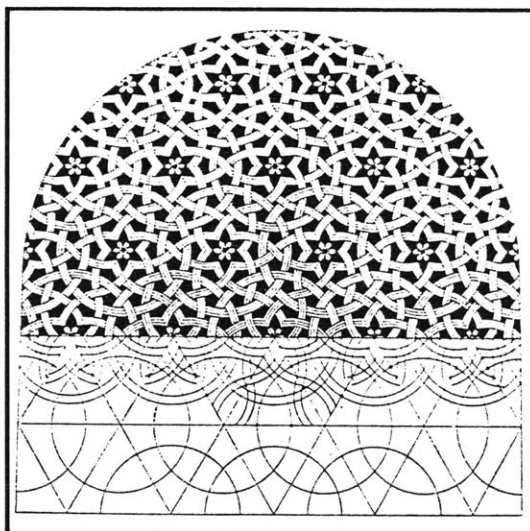
*Fig.5: Drawing of a stucco panel,
Khirbat al-Mafjar*

*Fig.6: Pattern from Qal'ah-i-Bist,
Afghanistan; late tenth / early eleventh
century*

was the **interlacing of the vine scroll with geometric frames** (fig.7). And finally came the **complete assimilation** of both where "the stems of the vine were given the shape of what had formerly been a nonvegetal pattern, or conversely, the geometric framework came to life and the vine leaves sprouted directly from it."[7] In another instance, and based on the type of **extensibility** of foliated ornament, Allen also identifies a few "demiarabesque forms" like the "foliage net", the "continuous scroll", and

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[7]Allen, Five Essays on Islamic Art, pp.4-5

the "radially symmetric medallion" (fig.8).[8] Now even if we agree with Allen's historical argument—that the four major types came one after the other, his point of departure—the nature and development of geometrization of vegetal designs—satisfies an outsider's curiosity about abstraction in Islamic ornament and its development from Antiquity, more than it helps us understand the internal mechanics of the geometric composition of the designs themselves.
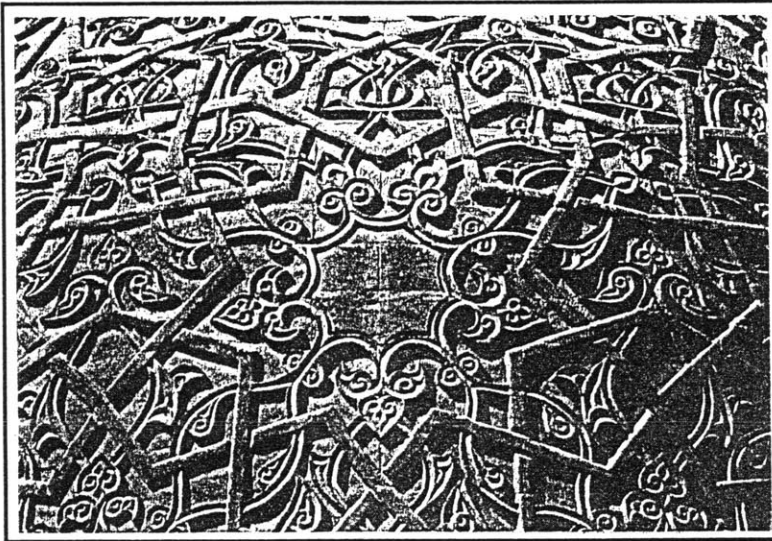
Fig.7: Detail from the dome of Qaitbay, Cairo, Mamluk period
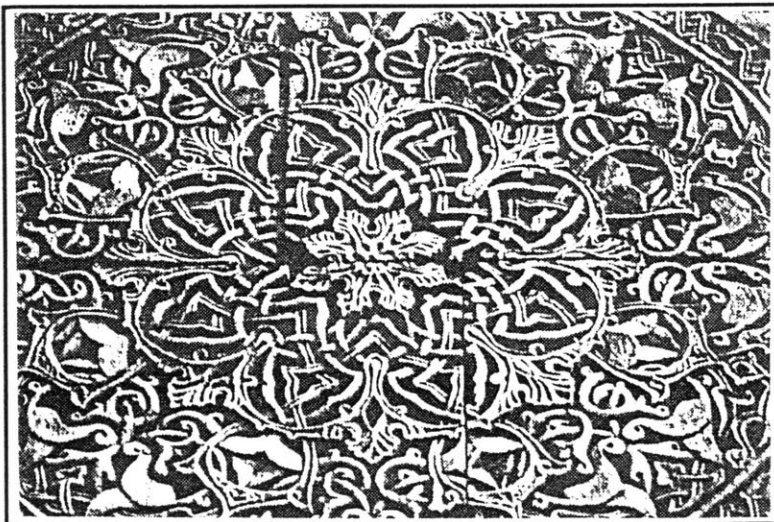
Fig.8: "Demiarabesque" medallion in porch of the madrasah of Sultan Isa, Mardin, Turkey; 1835

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[8]Ibid., p.53

The vegetal/geometric distinction is also applied in Grabar's organization of the motifs of early Islamic ornament. He divides them into three broad categories: vegetal, purely geometric, and a miscellaneous group which might be incorporated into either one of the first two.[9] In his latest Mellon lecture on geometry, Grabar differentiates between three **types of geometry** used in ornamental designs and which correspond to the above classification. But the point of departure here is **the degree of rigidity vs. looseness of geometry itself, and the emphasis is on the geometric basis of vegetal decoration.**

So once again, we have the category of **purely geometric patterns.** This would include any "form which must first be expressed as a geometric pattern in order to be understood". And it is here where we can talk of the "wallpaper" continuous type, of lattice nets, congruent tiles, and of "a regular figure creating a 'regular' pattern". Its key feature is that "it has **no limit of growth** and simply stops abruptly whenever a border, the wall, or the floor area stops" (fig.9).[10] Yet, Grabar's concern is more with the question of why this particular type was used in ornament, rather than with what it is or how it could be regenerated. He considers the latter problem "relatively simple", only requiring the discovery of the "**theoretical type** of the given pattern by redrawing it or looking it up in books of models".[11] The second group has to do with **implied geometry expressed in vegetal designs** (fig.10). This kind of geometry is "much **less rigid** and, therefore, more difficult to define". Being the "trellis on which the vine or the ivy are grown or displayed", it is, therefore, Grabar argues, rarely an end in itself, but rather an invisible means of supporting a narrative

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[9]Grabar, The Formation..., see pp.185-86

[10]Grabar, "The Mediation of Geometry", Introductory Demons Toward a Theory of Ornament, A. W. Mellon Lectures in the Fine Arts (unpublished draft), 1989, p.14

[11]Ibid., p.8-9

Fig.10: Stucco decoration from the Alhambra palace, Granada, Spain
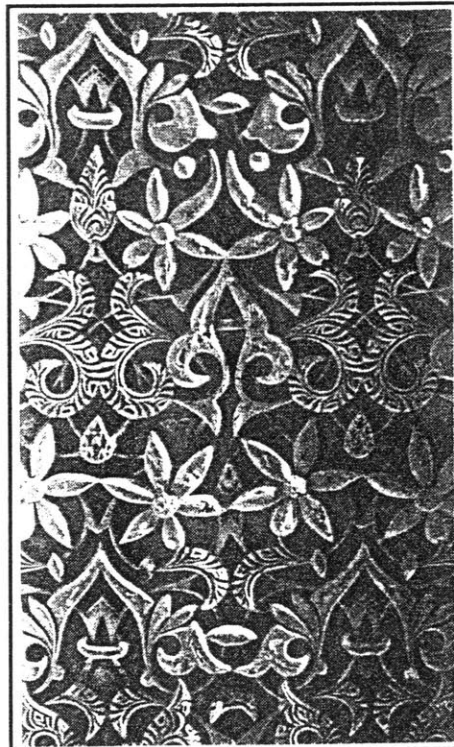
Fig.9: Detail of brickwork. Afghanistan, Ghorid period
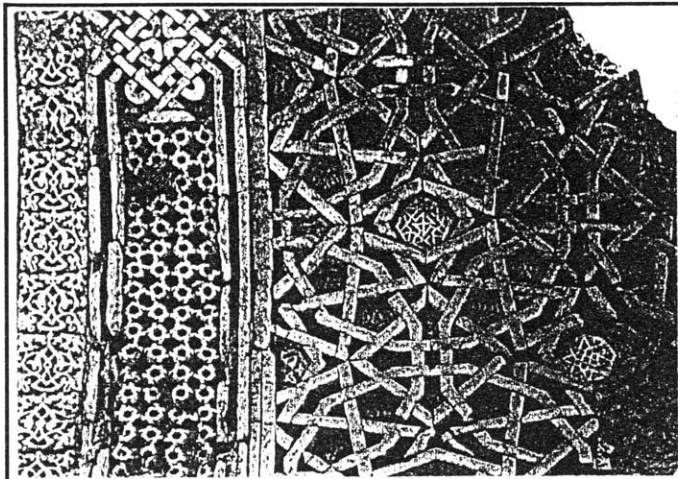
message.[12] The third kind is **"loose geometry"** which is thought to usually include "repetitive motifs whose rhythm require calculation", and occur in **border patterns or overall designs**, in ceramics, on mosaic floors, or within architectural facade compositions[13] (figures 11 & 12).
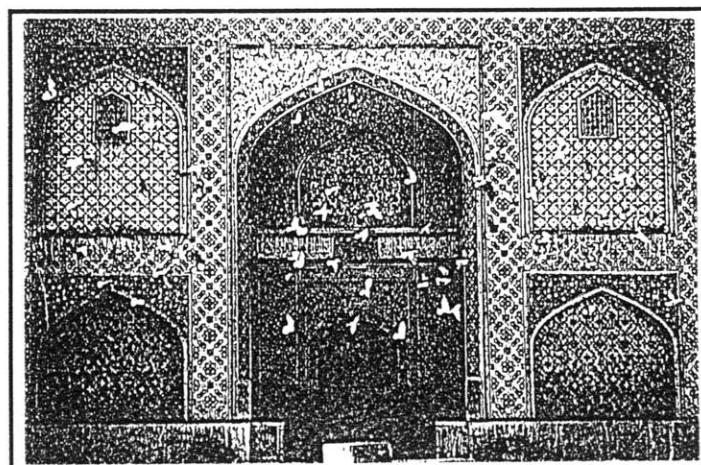
Fig.11: Facade of Harun Wilayat tomb, 16th century, Isfahan, Persia

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[12]Ibid., pp.9-10
[13]Ibid., p.10

Fig.12: Floor pattern in the south-west iwan of Sultan Hasan College Mosque, Cairo

Grabar's classification of ornamental designs according to the types of geometry utilized enriches our understanding of the role of geometry as a **perceptive artistic tool**. "Rigid geometry" is the one which appeals to us most; it is the most apparent of all and is the object of its own contemplation. "Implied geometry" is covert and more difficult to detect. It nevertheless structures our perception of the stylized vegetal designs. And "loose geometry" is there only to facilitate our perception of the org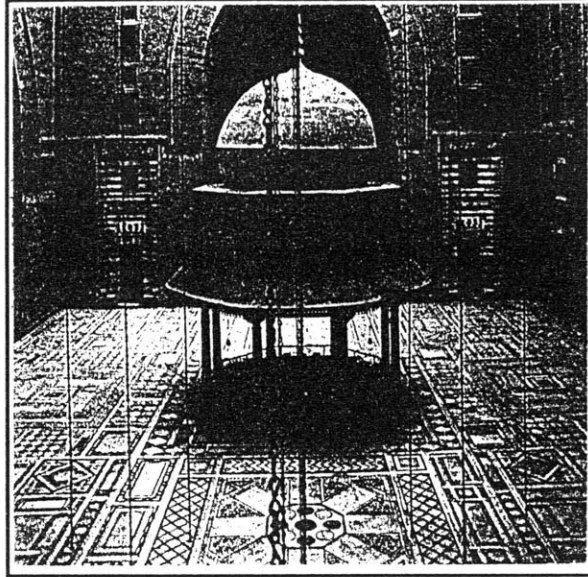anization of surface ornament via framing and bordering. These actually correspond with Gombrich's differentiation between **"filling", "linking", and "framing"** as alternate functions of geometry (rigid geometry for filling, implied geometry for linking vegetal motifs on the basis of a hidden geometric framework, and loose geometry for framing).

We have seen so far several alternative approaches to the classification of ornamental designs: in terms of the typological differentiation of the craftsman, descriptions of different compositions for filling a surface, historical development of the interaction between vegetal and geometric designs, and the utilized types of geometric structure. Such approaches tell us about ways of describing, analyzing, or perceiving the designs either by

their original creators or by external observers. They do not contribute, however, to a rational reconstruction of the process of their making.

There are still other ways of classifying geometric ornament. One of them is based on the known possibilities of covering a plane derived from **crystallography**. Other **mathematical** approaches deal primarily with the **tessellation** of the purely geometric type[14], or with the differentiation between **geometric systems of proportioning**[15] (Bulatov, El-Said). Such methods, however, have more to do with the theoretical processes of generating the designs, rather than with rational methods of perceiving them. They are therefore discussed in their appropriate place in this chapter.

2-   VISUAL TENSION AND PART/WHOLE AESTHETICS

I T IS NOT UNCOMMON to look at the aesthetic comprehension of an ornamental design in terms of its **part/whole structure**, as representing a whole which subsumes an infinite number of parts that are visually autonomous. This direction revolves around the distinction between an overall, holistic perception of the completed configuration and the perception of individual parts as independent entities. A tension is thereby created where it is possible to lose one's self in an array of different shapes or else to begin with the smallest detail and trace its connection up to the larger design.

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[14]Regular tessellation; using one-type regular polygon. Semi-regular tessellation or tiling the plane with a combination of regular polygons. And tessellation with irregular convex and concave polygons (see Haresh Lalvani, "Pattern Regeneration: A Focus on Islamic Jalis and Mosaics", The Impulse to Adorn: Studies in Traditional Indian Architecture, Marg Publications, 1982, pp.125-136

[15]The square and the root two system of proportion, the hexagon and the root three system, the pentagon and the golden mean which rules its composition.

As far as early geometric ornament is concerned, and based on an understanding of **geometric motifs** as elementary constituents of geometric ornament, Grabar proposes, early in his work, a "tentative hypothesis" about a characteristic **tension, in geometric designs, between a "complete and a broken unit"**. The creator of the pattern would tend "to avoid making the unit or units with which he was working totally visible or explicit. He often broke them off suddenly or combined neighboring motifs in some new fashion".[16]

Grabar relates his hypothesis to the creator's purpose of avoiding "the rigidity of a purely geometric composition". One might detect, however, an implicit attempt to project a psycho-cultural assumption—related to Grabar's other notion of the "art of illusion"—on an aesthetic reading of geometric ornament. The limitations of the argument lies in basing a generalization upon a specific way of conceiving geometric ornament—namely: "a pattern based on intersecting straight lines, on circles, or on combination of circles and straight lines"[17].

Giving less importance to the individual motifs as constituent units, Ettinghausen addresses the question of part-whole aesthetics in Islamic ornamental design on a more holistic level: "It is not so much the individual motif... which asks for our attention and possible interpretation, but rather the whole ensemble, the *Gestalt*, which impresses itself on our sensibilities and represents our aesthetic experience. The immediate and perhaps the exclusive appeal is made by the decorative structure of the integrated totality, irrespective of whether we understand the meanings of certain designs or not".[18]

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[16]See The Formation..., pp.185-86
[17]Ibid., p.185
[18]Ettinghausen, "The Taming...", p.15

Al-Faruqi, in his turn, suggests that there exists, in all Islamic painting and decoration, a "...**compelling movement** from one unit in a design to another, and then from one design to another, indeed, from one whole field of vision to another..."[19] In the case of ornamental design, the denaturalizing aspect of every field of vision is thought to be enhanced, on the one hand, by "the absence of variation, and of development" made possible by stylization, and on the other hand, by its infinite extensibility achieved through repetition and "geometrizing".[20] Confronted with such an infinite field of repeating units or figures, whether purely geometric or stylized from nature, the spectator's vision, we are told, is **compelled to move through the interlaced, yet autonomous units,** one after the other:

> "...the more closely related the figures are, thus compelling movement, punctuation and rhythm, and the more resistance to the movement is put up by the circuity and brokenness of the lines, the more power is needed to effect that movement. This power is the arabesque's **momentum**".

These brief accounts of scholarly attitudes, on the question of aesthetic perception of Islamic ornament, raise the issue of the nature of the **cognitive process of perception** and its relation with the part/whole **structure of the perceived design.** The interaction itself, between the viewer and the design results from the congruence between the structure of the cognitive process and that of the physical reality of the object.[21] The repeatedly raised notion of "tension" or "compelling movement" on the part of the viewer, is actually due to the **uncertainty or hesitation** of the observer between **holistic and sequential perception.** This is why the designs leave the spectator, as Paccard puts it, "in perpetual thought, for, in deciphering one figure, another one will appear **enigmatically,** so that he can never find

[19]Al-Faruqi, Tawhid..., p.255
[20]Ibid, pp.254-55
[21]See Stephen Grabow, Christopher Alexander: The Search for a New Paradigm in Architecture, Oriel Press, 1983, pp.193-97

the beginning or the end of the lines which weave in and out ceaselessly"[22] And finally although holistic and sequential perceptions are not necessarily related to Islamic ornament in particular, yet it could be argued that Islamic designs excel in revealing the idea of a part/whole structure. But, again, to stretch the argument about their unusual aesthetic effects— **enigma, illusion**, and even some kind of **magic**—could only contribute to the old **exotic** notion built around Islamic decoration.

B- THE SEARCH FOR DESIGN THEORIES OF GEOMETRIC ORNAMENT

1- ORNAMENT AND TRADITIONAL MATHEMATICS

THE QUESTION of the role of philosophy and medieval science in the intellectual/theoretical status of ornamental art was discussed in chapter (II). In their attempt to formulate a theory of art of the Islamic world in general, and of ornament in particular, we have seen how contemporary scholars are searching for a possible medieval interest in **aesthetics** and in **geometry as a science**. We have also looked at their search into historical written sources for any evidence that may shed some light on the type and intensity of the possible relationship between **traditional mathematics** and the design and production of ornamental motifs.

The cultural/historical aspect of the discussion is not of primary concern here. What is rather more relevant, in a scientific analysis of ornamental art and its geometric basis, is to find out **how much we can know from mathematical treatises about design processes used by craftsmen**, and to what extent are contemporary scholars able, or at least attempting, to **make**

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[22]Paccard, Traditional Islamic Craft..., p.135

use of traditional mathematics in formulating a generative theory of ornament, based on geometry, and which can be applied in reproducing or elaborating on the past designs.

Only a few of the technical and mathematical treatises applied to decoration have been properly published or translated (as in M.S. Bulatov's *Geometricheskaia Garmonizatziia v Arhitektury*, Moscow, 1978). One of the well known treatises is *Miftah Al-Hisab* (**Key to Arithmetic**) by Giyath al-Din Jamshid al-Kashi, the fifteenth century mathematician and astronomer. Although directed mostly to architects, it contained chapters on transformations of polygons and *muqarnas* designs[23] (Fig.13). A more important treatise of the tenth century is *Fi ma yahtaju ilayhi al-sani' min 'ilm al-handasah* (**On What the Craftsman should Know of Geometry**) of abu-l Wafa' al-Buzjani (940-98). This work "is a practical handbook; it does not dwell long on the complex mathematical aspects of geometry, but rather offers a constructive hands-on version of geometry explained in fairly straightforward language"[24] (fig.14). It gives a greater attention to polygons; their construction, transformation, and inscription into circles. Appended to a copy of al-Buzjani's work is an anonymous Persian treatise on the introduction to like and congruent figures. It "shows a variety of geometric figures, patterns and constructions (Fig.15) which Bulatov has developed into tiling patterns"[25].

Such treatises, therefore, although reflecting the theoretical knowledge of mathematicians, played the role of 'how to' manuals for facilitating the

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[23]L. Golombek and W. Wilber, The Timurid Architecture of Iran and Turan, Princeton University Press, 1988, Vol.I, p.159

[24]Holod, "Text, Plan and Building: On the Transmission of Architectural Knowledge", Theories and Principles of Design in the Architecture of Islamic Societies, ed. Margaret Sevcenko, The Aga Khan Program for Islamic Architecture, 1988, p.3

[25]Ibid.
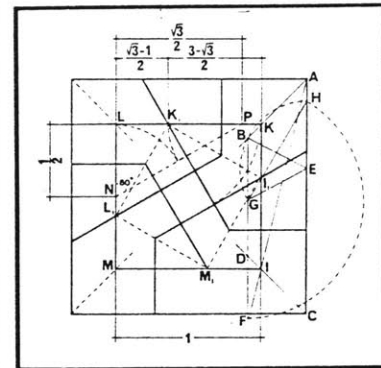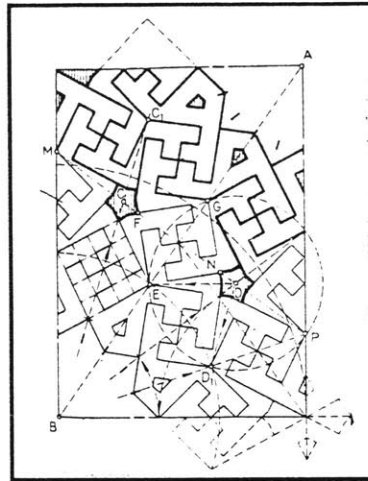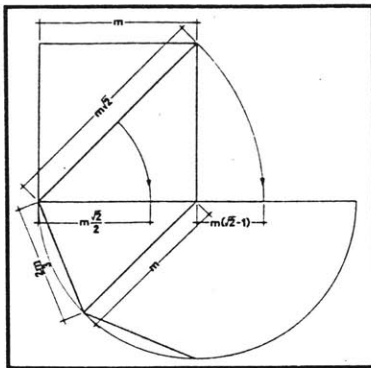
Fig.13 (top left): Proportional system of the "bowed" muqarnas, based on al-Kashi

Fig.14 (top middle): Illustration from Buzjani's treatise on geometry for craftsmen

Fig.15 (top right): Geometric design from anonymous treatise (after Bulatov)

Fig.16 (right): Radial design from Samarqand (after Bulatov)
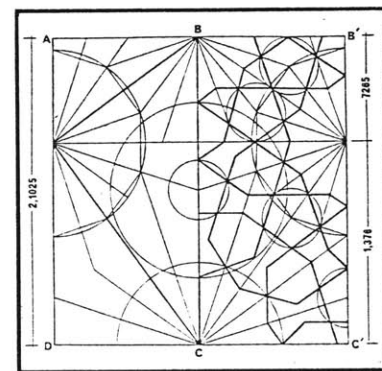
work of artisans. What Grabar finds striking in these treatises is "that the subtle and complicated mathematical formulas are not presented as illustrations, symbols or signs of a faith or even a cultural identity, but as **practical solutions** to architectural and ornamental requirements".[26] It seems also that the way these practical solutions were portrayed facilitated for some contemporary scholars the derivation of implied design principles, and the building up of hypothetical design processes, that are supposed to have been hinted at in the treatises and actually followed by craftsmen. According to Golombek and Wilber, "El-Said and Parman, Bulatov, and several others suggest **a process similar to the one described in the anonymous treatise.**" Bulatov also thinks that all the proportioning systems used in the Timurid period can be found in the illustrations of the

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[26]Ibid.

anonymous treatise. One particular proportioning system suggested by Bulatov—**the radial grid** (fig.16)—is emphasized in the same treatise where numerous examples of it are drawn, and special set-squares for generating the grid are also mentioned.[27] The next section deals with contemporary scholars' hypotheses, including those of Bulatov, whether derived from traditional treatises or drawing on modern mathematical theories.

2- LOOKING FOR GENERATIVE DESIGN PRINCIPLES

T HE INTEREST IN UNDERSTANDING the geometric design principles of Islamic ornament started in the nineteenth century. In Plans, Elevations, sections and Details of the Alhambra, **Owen Jones'** extensive study of the surface decoration of the palace was used to propose a hypothesis of how Moorish geometric patterns can be derived from simple grids (Fig.17). **John Bourgoin**, in his _Théorie de l'Ornement_ of 1873, attempted to formulate a universal system of repeat pattern or tessellation. In _Les Elements de l'Art Arabe. Le traits des entrelacs_ of 1879, he illustrates nearly two hundred examples of Islamic geometric patterns and analyzes their inherent geometric structures (fig.18). Later, analytic work on individual designs was also attempted by **Creswell**. But it is mostly in Soviet Central Asia, and since the 1930's, that geometric principles of proportioning were given an increasing attention by scholars like Rempel', Ratiia, Voronina, Man'kovskaia, and most recently by **M. S. Bulatov** who devoted an entire volume on geometric harmony in Central Asian architecture of the ninth to fifteenth centuries[28]. Significant work has also been done by several Muslim and non-Muslim practicing architects including **K. Critchlow, I. El-Said and A. Parman, N. Ardalan and L. Bakhtiar**. These, however, had a general tendency to 'poeticize' geometry or

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[27]See Golombek and Wilber, The Timurid Architecture..., pp.161-162
[28]Ibid., p.137

have stressed an esoteric interpretation of geometric principles—as we have seen in chapter III. And finally, there is the contribution of **L. Golombek, R. Holod, and D. Wilber**, whose speculations on the design principles and processes of the ornament in Central Asia were primarily based on El-Said and Parman and on Bulatov's achievements.

Fig.18: Analysis of an Islamic
geometric pattern by J. Bourgoin in his
Les Elements de l'Art Arabe (1879)

Fig.17: "Construction principles" (grids)
suggested by O. Jones for Moorish patterns
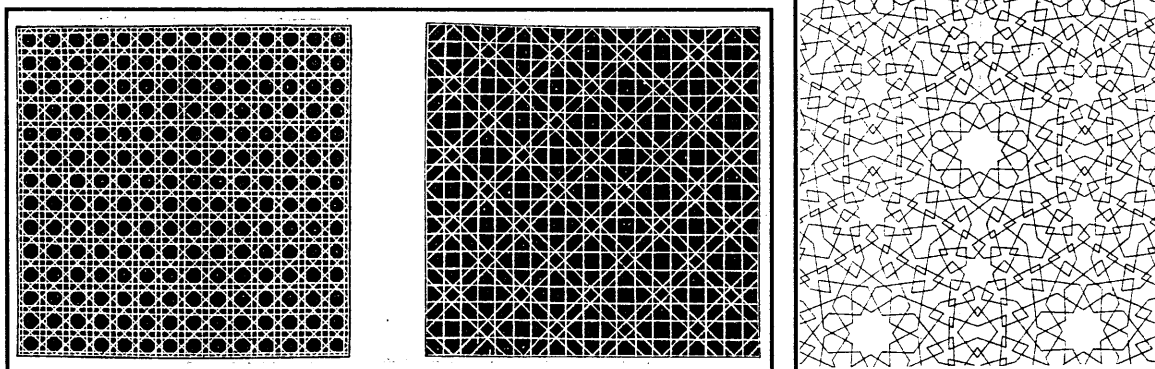
The basic motivation behind the work of these writers, whether scholars or amateurs, is a conviction that there ought to exist, on the base of the repetitive ornamental schemes, **a common generative process**, or at least some shared **rules, mathematical principles or geometric properties** that might have been known to the original creators. Geometric abstraction was increasingly believed to be "not, like a chemical formula, the simplified symbolization of some reality; like certain mathematical abstractions it is a reality in itself, an artificial invention that acquired its own set of rules".[29] There was a common feeling that the historical study of styles and ornamental motifs should contribute in building up a common **formal vocabulary**. And that "there is still no generally accepted terminology for

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[29]Grabar, The Formation..., p.191

the many different kinds of motifs used in Islamic geometrical ornament, nor for the methods of forming repeating patterns from them."[30]

Reflecting on the interpretation of early Islamic ornament, Grabar states that: "It is quite possible that the ultimate explanation of its character lies far less in art historical exercises than in a comprehension of contemporary mathematical thought...."[31]. In The Alhambra (1978), Grabar identifies a few "key geometric principles" in the decorative designs of the palace (fig.19): **symmetry**, which permits the varied repetitions of the small compositional units; **linear growth**, which transforms geometric units along straight or broken lines; and **rotation**, "which provides the major direction of ornament".[32]

What Grabar is vaguely referring to here, are principles derived from a **crystallographic** analysis of ornament where symmetry and symmetrical rotation are primary rules and where translation is the term used for "linear growth"—as we shall see later in this chapter.
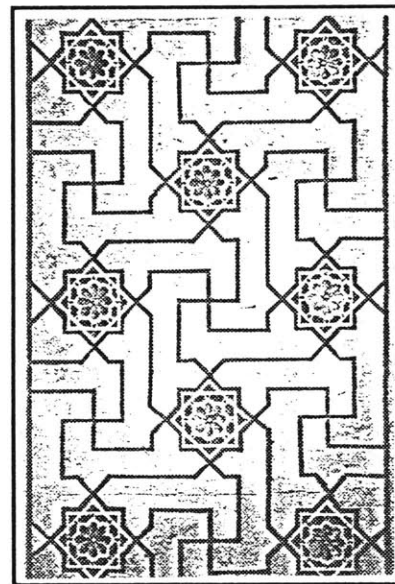
Fig.19: A decorative design in the Alhambra palace, Granada, Spain

In Geometric Concepts in Islamic Art, El-Said and Parman aim at illustrating "how the craftsmen at different times and places in the Muslim

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[30]A. J. Lee, "Islamic Star Patterns", Muqarnas, ed. Oleg Grabar, E. J. Brill, The Netherlands, Vol. 4, 1987, p.182
[31]Opcit., p.191
[32]Grabar, The Alhambra, Harvard University Press, 1978, p.194
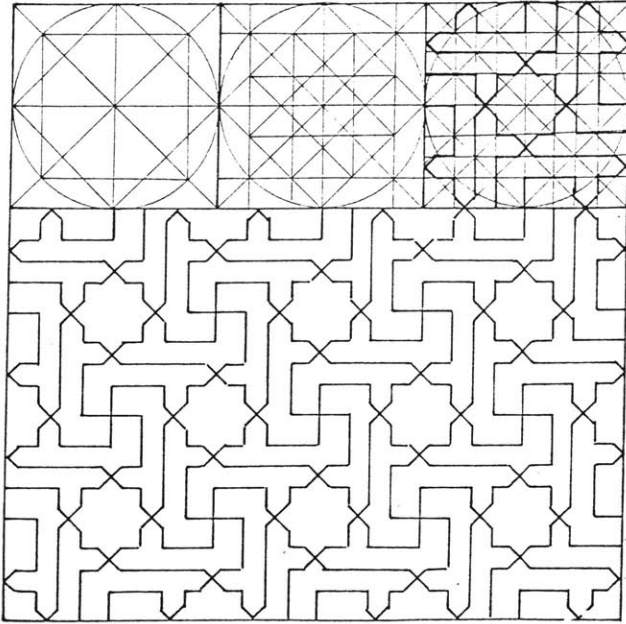
Fig.20: The square and the √2 proportioning system
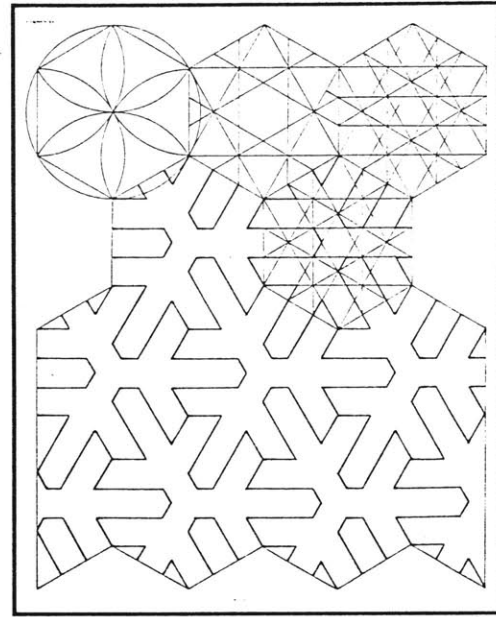
Fig.21: The hexagon and the √3 proportioning system

Fig.22: The pentagon and the √5 proportioning system
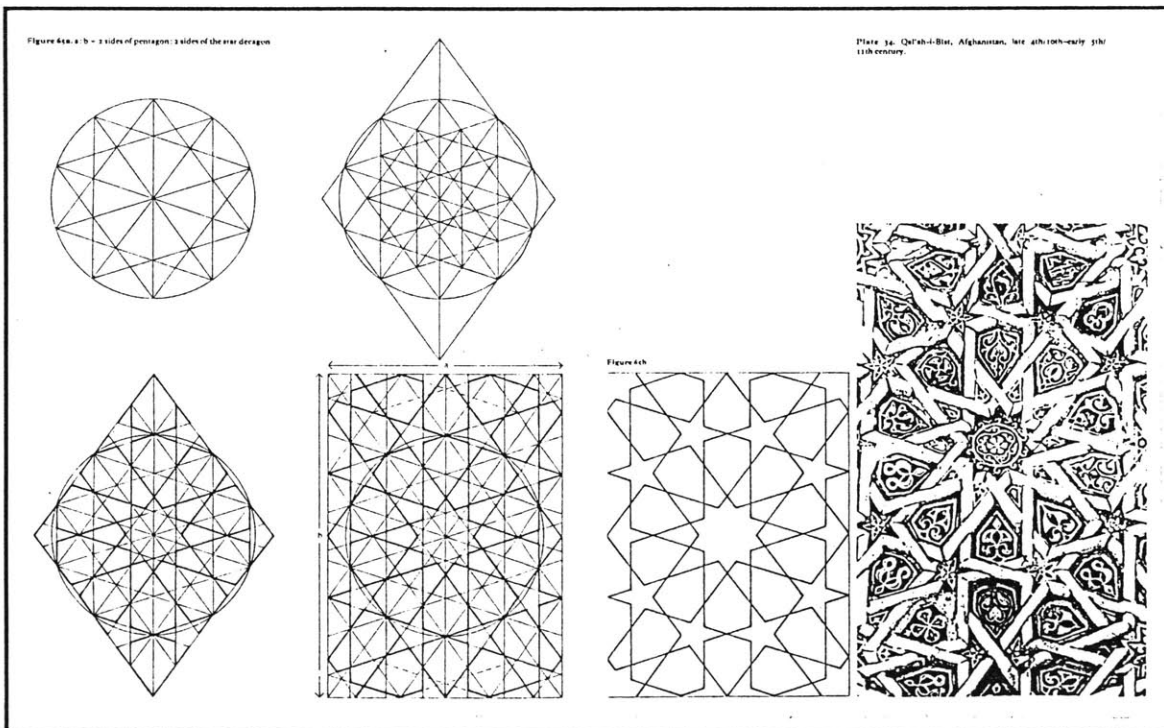
world proceeded to **apply** the **geometric principles** to the practical problems of geometric patterns". They suggest the presence of three known basic principles of **proportioning**: the square and the $\sqrt{2}$ system (fig.20), the hexagon and the $\sqrt{3}$ system (fig.21), and the pentagon and the $\sqrt{5}$ system—or golden ratio (fig.22). The proposed **design process** which utilizes such systems is built around the concept of a **"repeat unit"**—the elementary part of the pattern which if repeated will regenerate the whole design. The repeat unit itself is thought to be determined by using one generative structural device—**the circle**. So the design process starts with applying one of the proportioning systems to a particular circle (defined by means of its radius as the **basic or unit measure**). This is practically done by dividing the circumference of the circle into 4, 5, or 6 divisions, or multiples of them, and connecting the points of division along grid lines that reflect the particular proportioning system.[33] Then, the process is supposed to continue along the following steps (as described by Golombek and Wilber):

> "Each design begins with the **drawing of the grid..... Points on the grid are then located** according to geometric relationships within it. **Lines are drawn to connect these points**, and their **intersections** locate secondary points. The artist must then 'see' his design within this new configuration, **selecting certain 'figures', while rejecting others**. These figures include the regular polygons and star polygons (triangles, squares, pentagons, hexagons, octagons, decagons, and occasionally duodecagons), as well as a series of irregular polygons."[34]

The process with all its steps is introduced as a universal method of generating two-dimensional patterns with the key element being the circle. Everything starts from there, and all geometrical patterns, in a way, are reduced to the generative unit of the circle. **The emphasis on the circle** is

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[33]El-Said and Parman, Geometric Concepts in Islamic Art, World of Islam Festival Publishing Company Ltd, London, 1976, p.7

[34]Golombek and Wilber, The Timurid Architecture..., p.159

even more evident in Critchlow's description of the formation of patterns. The circle is idealized and mysticized, and the formation of the initial circle from a single point, and that of the subsequent grids of circles, becomes **the story of the creation of the universe.**[35]

What is striking, however, is that the concept of the generative circle, and the organizing grid based on the intersecting circles, is not followed strictly in the analysis of the √5 proportioning system. El-Said and Parman are simply prepared to ignore their theory in cases where it does not work (for example, since the pentagon does not repeat in a plane without leaving gaps, one cannot have a generative grid of circles that is able to produce a pentagonal composition).[36]

Golombek and Wilber seem more interested in the cultural and historical aspects involved in the question of design principles and processes. Their contribution to the subject is limited to the description of the achievements of Bulatov and of El-Said and Parman, and to illustrating them by using historical Timurid examples. Bulatov himself empha-sizes the role of the **grid** in the generation of patterns. Construction grids here are supposed to consist of **six types** based on squares, semi-squares, double squares, equilateral triangles, combinations of squares and triangles, and on radial coordinates which produce the pentagon[37] (fig.23). But although Bulatov, according to Golombek and Wilber, is thought to have produced a similar hypothesis to that of El-Said and Parman, one can notice essential differences. Other than Bulatov's emphasis on the proportioning grids rather than circles, Bulatov's approach allows for more particular cases

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[35]Critchlow, Islamic Patterns: An Analytical and Cosmological Approach, Schocken Books, London, 1976, see esp. section 1: "The point of Departure"

[36]See esp. section II.4: The Pentagon and the Golden Ratio.

[37]Golombek and Wilber, The Timurid Architecture..., p.160

like grids of semi-squares, double-squares and the combination of square and triangle.

Fig.23:

Top left; design from Samarqand based on equilateral triangles (after Bulatov).
Left; design from Herat based on equilateral triangles and squares (after Critchlow).
Top right; a radial design from Samarqand (after Bulatov)
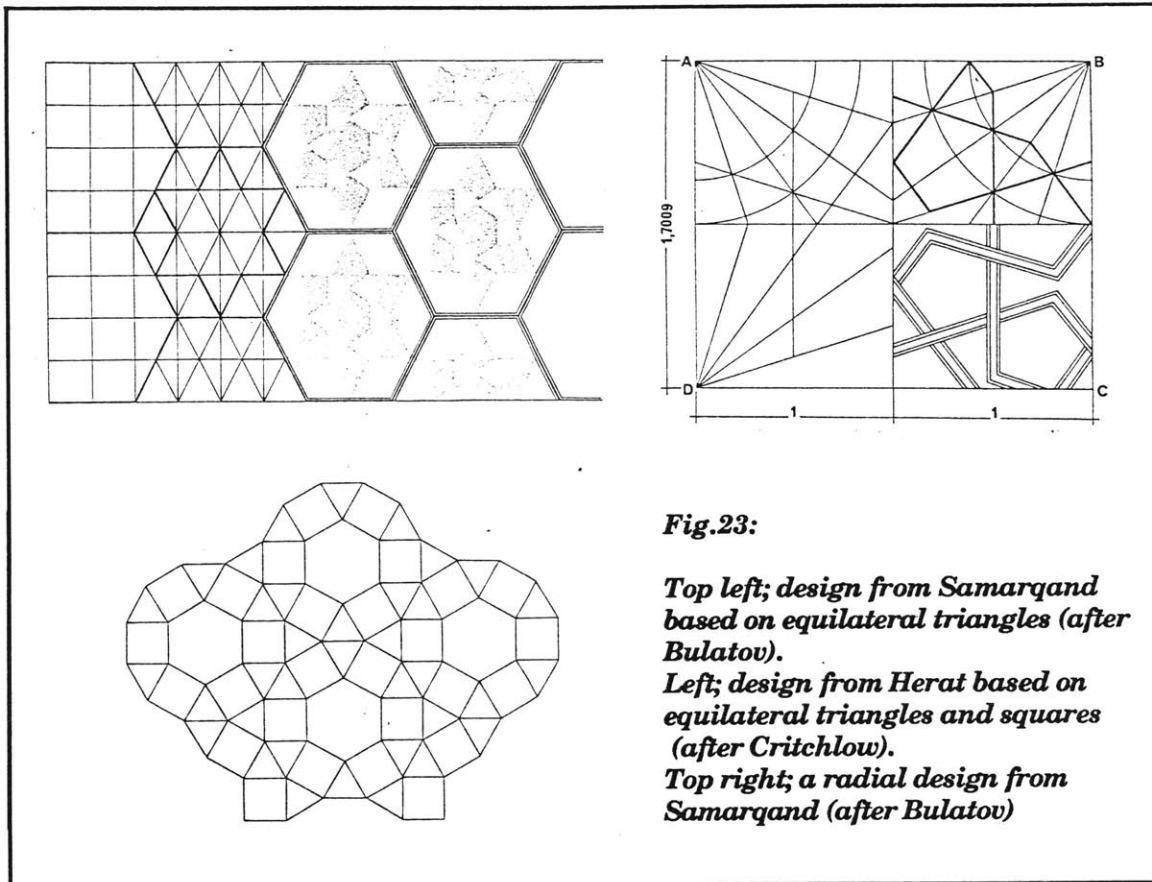
Bulatov, Golombek, and El-Said and Parman propose, moreover, that proportioning systems were also used in **architectural design**.[38] There is, according to Golombek and Wilber **a common geometric basis and a shared design methodology** for Timurid design expressed in the proportioning of spatial architectural design, in three-dimensional geometric "objects" (stellate vaults and *muqarnas*), and in surface ornament.[39] Golombek and Wilber's work in this field is again based on contributions of Bulatov and other Soviet scholars. The architects of the Timurid period are thought to

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[38]They even suggest their relevance to Arabic poetry, calligraphy, and music as was discussed in chapter III
[39]Ibid., p.138

have utilized two simultaneous processes for conceptualizing their design: **geometric/proportional, and analytic/modular**. The first involved drawing up an abstract plan with **systems of proportioning**—similar to those of geometric ornament—for governing the ratios of length of spaces (fig.24). The second process was to translate the plan into real dimensions using **grids and modules** (fig.25). In the process of proportioning, a single measurement is thought to have been selected by the architect and used as a **generative unit**—the length of a room, a facade, or a courtyard, the diameter of a dome...etc. This reminds us of the concept of generative unit in the ornamental process of proportioning, i.e. the selected radius of the initial circle.

Fig.24: Samarqand, Masjid-i jami';
Geometric analysis of sanctuary
(Bulatov)
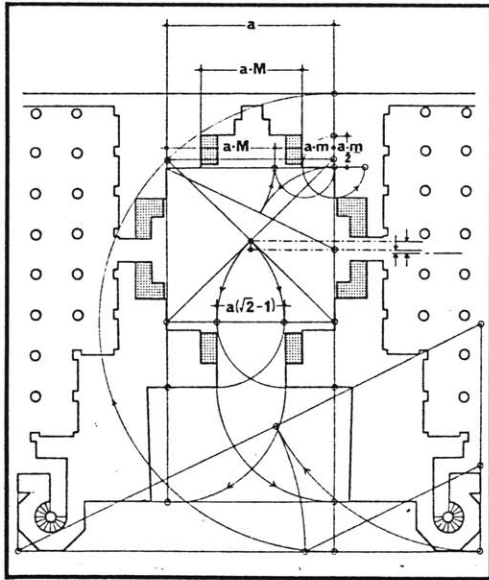
Fig.25: A fragmentary plan of
a mosque (after Balkanov)
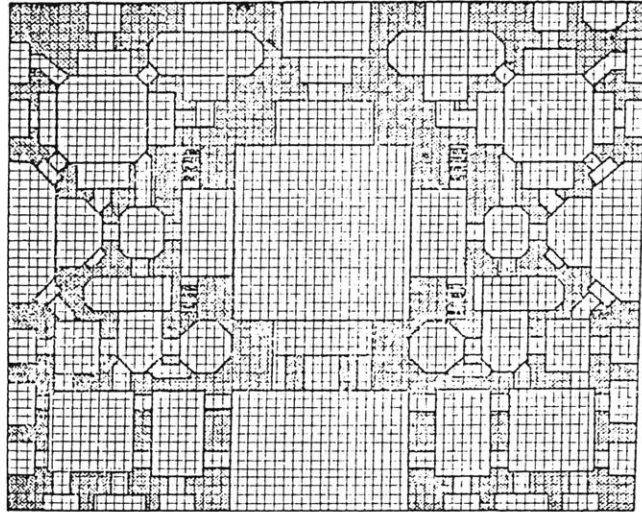
El-Said and Parman, Soviet scholars, and many others, have made several attempts at analyzing traditional Islamic buildings according to the hypothetical proportional systems thought to have been used in their original design. In such attempts, however, **methodological pitfalls** could be involved—as pointed out by Hazem Sayed in a critique of a lecture by

Golombek[40]. Applying a geometric reconstruction to a plan of a monu-ment might easily lead to a false geometric analysis based on an **inaccurate survey of the building,** or to two different analyses based on two different surveys of the same building. But the most skeptical case happens when two different reconstructions could work for the same measured plan.
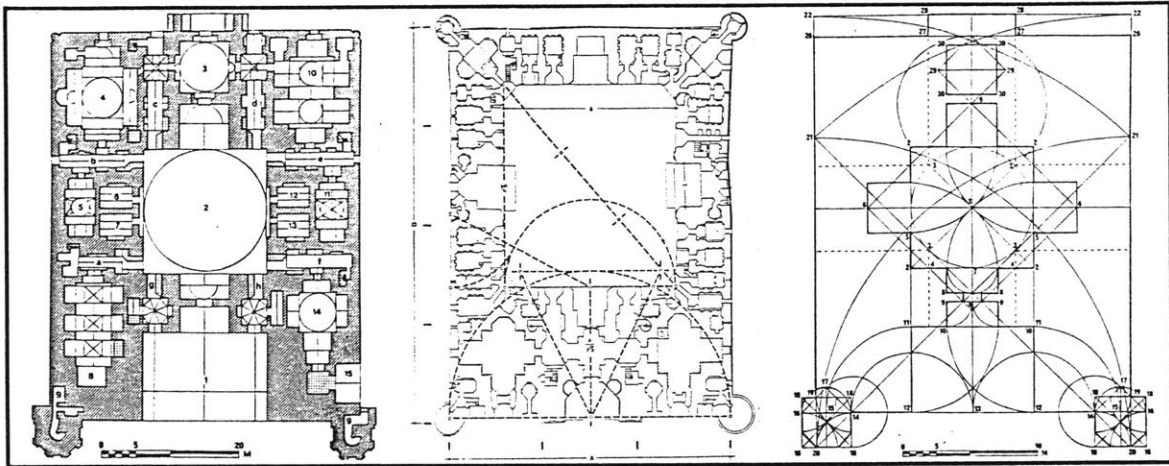

Fig.26: Shrine of Khvajeh Ahmad Yasavi, Turkestan. Left: plan. Middle: geometric analysis by Bulatov. Right: geometric analysis by Man'kovskaia

Comparing two different geometric analyses, by Man'kovskaia and Bulatov, for the same building: the shrine of Khvajeh Ahmad Yasavi, Turkestan, Sayed reveals that they are completely different. The first is based on the $\sqrt{2}$ proportional system, the second on $\sqrt{5}$ (fig.26). Such a finding would obviously cause **serious doubts** about applying the proportional systems to architectural plans, and would also remind us of the possibility of similar cases when applying these very systems on an ornamental design. One might even be led to think that the proposed geometric reconstructions might be exaggerated speculations that go beyond the simple necessity of laying out a building structure:

[40]Hazem Sayed, "Review / Our View", a review of a lecture by L. Golombek entitled "Geometric Theory and Practical Application in Later Persian Architecture", Al-Asas 1, published by the Students of Islamic Art and Architecture, Harvard/M.I.T., November 1982, pp.6-11

"One must look at whether the final form can be derived from other geometric constructions. This is critical because if there are several ways to arrive at the same final form, we cannot make a case that the builders used any particular set of steps".[41]

It might be worthwhile, finally, to discuss the contribution of Christopher Alexander who, although not primarily concerned with Islamic studies, claims that Islamic historic examples of decorative designs (especially on rugs) (fig.27) were a major source for his research on ornamental order—which is in turn extended to the order of architectural design. As part of a larger argument on the structural nature of order and its relation with geometry,[42] Alexander suggests that the holistic structure of "**ornamental order**" (and any other type of order for that matter) is based on **fifteen geometric rules** or **ordering principles**[43]. They are based on an understanding of the elementary parts of the ornamental composition as **centralized** entities connected by linking **boundary** fields.

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[41]Sayed, "Review / Our View", p.10

[42]These ideas are expressed in Alexander's The Nature of Order, (draft for a book to be published by Oriel Press), especially in the chapter entitled:The Structural Nature of Order

[43]See Grabow, Christopher Alexander..., pp.201-203, where the properties are listed as follows:
1- Levels of scale
2- Centers
3- Boundary
4- Alternating repetition
5- Positive space
6- Good shape
7- Local symmetries
8- Deep interlock and ambiguity
9- Contrast
10- Graded variation
11- Roughness
12- Echoes
13- The void
14- Inner calm
15- Not separateness

Fig.27: Kazak rug, Caucasus
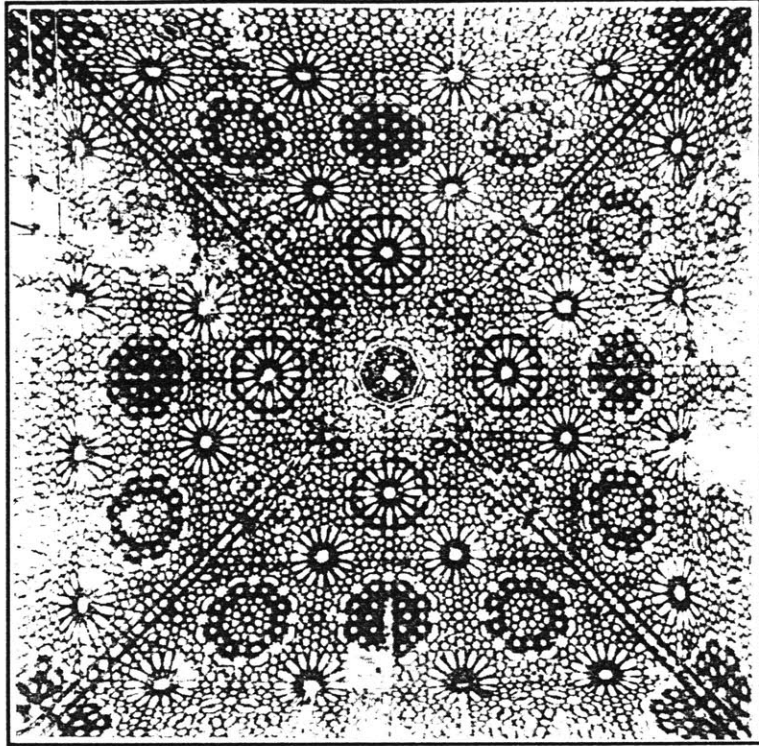
Fig.28: Ceiling detail. Palacio de Comares, Alhambra, Granada

They also deal with the **relationships between parts,** like their rhythmic repetition, internal symmetries, and the degree of ambiguity of their linkage. And finally with general **aesthetic properties** of figure-ground reversal, contrast, and geometric interlocking, and with more **'mysticized' qualities** of calm and inner-balance. These **generic** rules are thought to identify with the **part/whole** structure of the design affecting the overall composition as well as being **recursive** at every level of scale. Alexander did not stop at identifying his geometric properties, he wanted to explore "what kind of processes are able to generate them"[44]. In his search for a process, Alexander realized that the property of "centers" had the most power in producing geometric order. From here he deduced a "reiterative **centering process** that actually produces all the other properties". Illustrating by a ceiling detail from Alhambra (fig.28), Grabow describes this process as

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[44]Ibid., p.204

being "essentially a structure of centers" responsible for achieving the part/whole structure of the design, for:

> "[it] consists of taking one of its emerging centers and developing it or elaborating it—in short, differentiating it. This operation is then expanded **outwardly**, to some larger center in which the first center is embedded; **inwardly**, to some smaller center or centers within the first center; and **laterally**, to other centers of similar size which lie next to the given center".[45]

Other than being not directed to Islamic ornament in particular, Alexander's ideas here are also arguably intended to account not only for ornamental order but any other order including that of architecture design and building production. And although it reminds us of El-Said's and Parman's concept of generic circle units, Alexander's centering process lends itself more to an aesthetic way of **perceiving hierarchy** in ornamental order, or, to the **hierarchical cognitive process going** on in the mind of the designer while producing the pattern, rather than to a logical step-by-step method that could be actually used by the designer for generating it.

The question of **the nature and the degree of consciousness of the theoretical principles, on the part of the creator of the design,** is not only to be raised in Alexander's case but also in the hypotheses discussed before. According to El-Said and Parman, the designer had to select between one of the proportioning systems that they propose before exercising his creative process of arriving at the single desired variation from an infinite available choice of combinations.[46] But the fact remains that, even if the preliminary ordering systems are invariant determinants, it is hard to accept the reduction of the designers' depiction of them, and their subsequent creative process, to a **single** mechanical step-by-step operation. In other words, the

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[45]Ibid., p.205

[46]El-Said and Parman, Geometric Concepts in Islamic Art, p.114

reductive ways in which theoretical principles and processes are often presented, are in need of more **cultural and historical verifications.** Although Golombek and Wilber have done a considerable amount of work in this direction, cultural/historical questions and problems—like modes of transmission of theories—need more serious investigation. They cannot be just avoided for not belonging to the scope of an internal *leitmotif*.[47]

C- APPLYING CRYSTALLOGRAPHIC THEORIES

B RINGING crystallographic and symmetry group theories to the field of ornament came after an increasing interest in the study of the **nature and types of symmetry that govern the repetition and arrangement of the individual motifs** in planar ornamental patterns. This trend appears to have started in the 1920's with Pólya and Speiser.[48] Unlike the earlier works of Jones, Bourgoin, and many others, which relied more on **descriptive methods** and the character of individual motifs, the new approach applies a purely **mathematical and quantitative** way of looking at the symmetrical compositions of the designs as a whole.

What is known from crystallography is that there are **17 possibilities of planar symmetry** known as plane crystallographic groups or classes of wallpaper (fig.29) first classified by the Russian scientist Evgraf S. Fedorov. Another **7 linear or one-dimensional patterns** are also possible. Any regular surface ornamental pattern should necessarily fall within the

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[47]See Grabar, "What Makes Islamic Art Islamic", Art and Archeology Research Papers, No. 9, 1976, p.2

[48]Branko Grünbaum, Zdenka Grünbaum, and G. C. Shephard , "Symmetry in Moorish and Other Ornaments", Computer & Mathematics with Applications, Vol.12B, Nos. 3/4, Pergamon Press, Great Britain, 1986, p.641
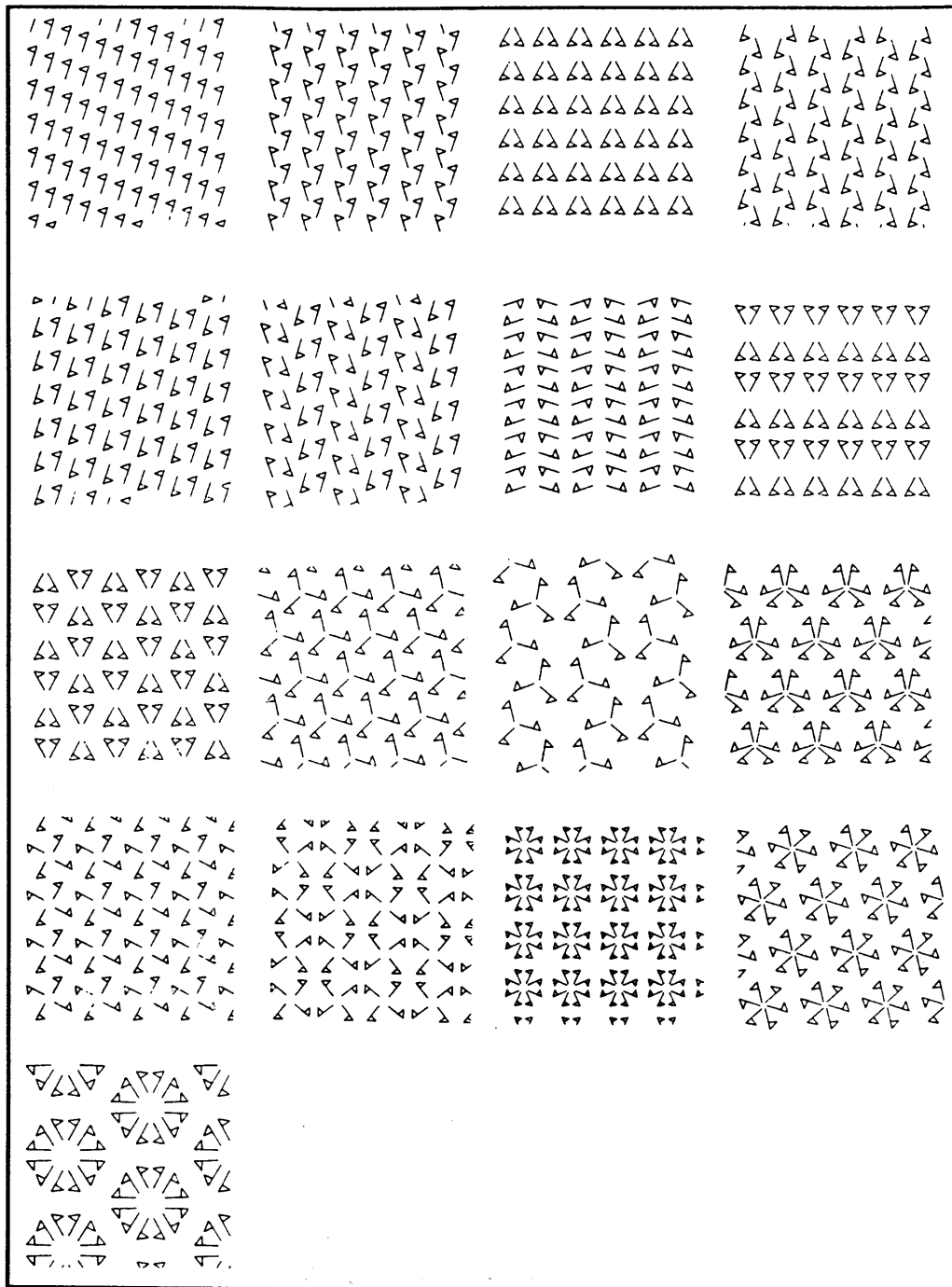
Fig.29: Patterns in which the common motif is a small "flag", which can exemplify the seventeen classes of wallpaper groups

above symmetry groups, but this does not mean that all the types are actually found or are equally distributed in known historical examples. Owing to their abundance and infinite variety, Islamic geometric patterns

in particular seem to exemplify most, if not all, of the primary seventeen groups. Although confined to the same limited number of basic types of arrangement, these patterns can have, however, unlimited variations within each type. The geometric arrangement of their repetitive elements seems to be governed by the four **symmetry operations** of **translation, rotation, reflection, and glide reflection** (which combines translation and reflection). Translation is of primary importance in the 7 linear pattern types while rotation comes first in the two-dimensional types. **Centers** of rotational symmetry (roto-centers) can be one of four basic types according to the number of times—2, 3, 4, or 6—the corresponding rotation would divide the plane. Deciding on the type of center is a major determining factor in generating a two-dimensional type pattern, it is half the way towards achieving a particular symmetry group.[49] To generate a whole pattern, it is also enough to arrive at the design of a small **fundamental unit** and repeat it according to the symmetry operations of the particular crystallographic type.[50]

The decorative designs of the **Alhambra** has a long history as a primary subject for scholarly mathematical analyses (fig.30). On his next trip to Spain in 1936, M. C. Escher (1898-1972) made detailed copies of the Moorish mosaics of Alhambra and the mosque of Cordoba (fig.31). These copies, along with results of his readings on crystallography, played a major role in his artistic career after 1937. He **substituted the abstract geometric**

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[49]The primary role of the roto-centers reminds us of Alexander's emphasis on centers and the concept of "centering" as the major power behind the generative process of the design. Roto-centers are not also foreign from the idea of the circle as the generative unit in the traditional mathematical analyses (of Bulatov, El-Said and Parman, and others). Their different types (2, 3, 4, or 6) also correspond to the alternative proportioning systems discussed in the other approach.

[50]The fundamental unit (or "unit cell") corresponds again to the concept of "repeat unit" discussed by El-Said and Parman (see also previous note).

figures from both sources with realistic motifs, linked in contiguous symmetrical series which could be repeated to infinity[51] (fig.32).
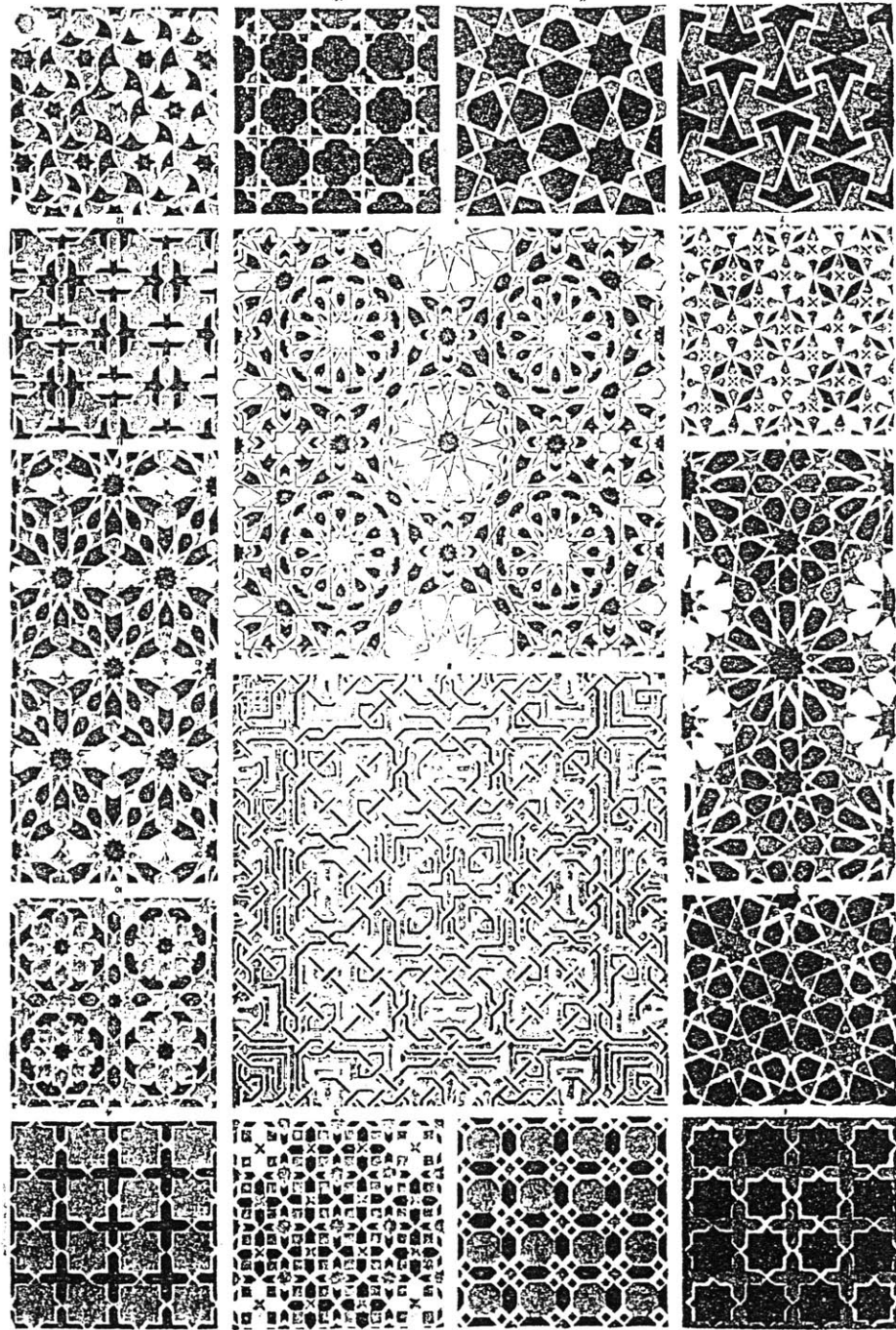
Fig.30: Mosic designs from Alhambra (in O. Jones' The Grammar of Ornament)

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[51]J. L. Locher, The Infinite World of M. C. Escher, Abradale/Abrams, New York, 1984, p.7
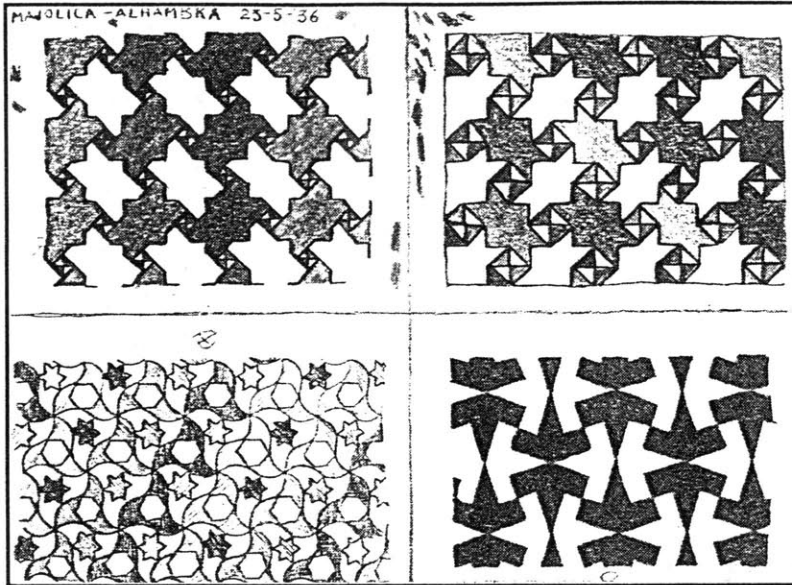
Fig.31: Copy of mosaics in the Alhambra by M. C. Escher (1936)
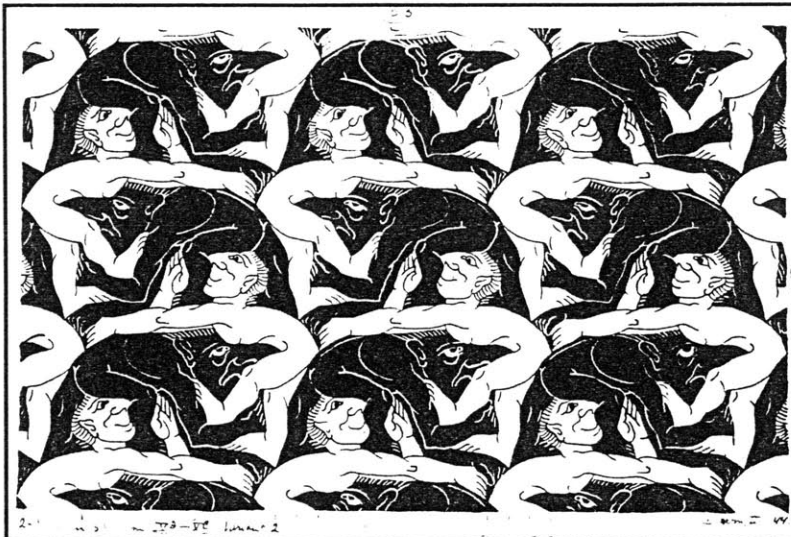
Fig.32: M.C. Escher; Study of Regular Division of the Plane with Human Figures (1944)

Escher clearly expresses his bias towards recognizable and natural figures as opposed to the purely geometric motifs used in the Islamic world where he cannot detect any significance or symbolic meaning. Equating representation to meaningfulness and abstraction to vagueness, he asks:

"What kind of figures? Irregular, shapeless spots incapable of evoking associative ideas in us? Or abstract, geometrical, linear figures, rectangles or hexagons at most suggesting a chess board or honeycomb? No, we are not blind, deaf, and dumb; we consciously regard the forms surrounding us..... Consequently, the forms with

which we compose the divisions of our surface must be recognizable as signs, as distinct symbols of the living or dead matter around us. If we create a universe, let it not be abstract or vague but rather let it concretely represent recognizable things.....".[52]

Although Escher acknowledges the Moorish mastery of "the art of filling a plane with similar interlocking figures, bordering each other without gaps", he is, nevertheless, extremely shocked by their confinement to geometric motifs, the explanation of which he finds in Islam's prohibition of "images". Had it not been for that, they would have been able to come close to his own more fascinating achievements:

> "What a pity that their religion forbade them to make images! It seems to me that they sometimes have been very near to the development of their elements into more significant figures than the abstract geometric shapes which they moulded. But no Moorish artist has, as far as I know, ever dared (or did he not hit on the idea?) to use as building components: concrete, recognizable figures, borrowed from nature, such as fishes, birds, reptiles or human beings. This is hardly believable because the recognizability of my own plane-filling elements not only makes them more fascinating, but this property is the very reason of my long and still continuing activity as a designer of periodic drawings."[53]

Nonetheless, the work of M. C. Escher still demonstrates one of the earliest and serious concerns in a crystallographic analysis of Islamic ornamental patterns—at least those of **Alhambra**. Later crystallographic-based works showed comparable concern with the same palace, but produced, at the same time, contradictory statements regarding the number of symmetry groups that are to be found in the ornaments of the

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[52]M. C. Escher, Approaches to Infinity", The Infinite World of M. C. Escher, ed. J. L. Locher, Abradale/Abrams, New York, 1984, p.15

[53]M. C. Escher, Preface in C. H. MacGillavry; Symmetry Aspects of M. C. Escher's Periodic Drawings, Utrecht: Oosthoek, 1965, p.vii

Alhambra. Eleven different groups, thirteen, and even all seventeen of them were claimed to be represented there by different mathematicians.[54] The reasons for their differences seem to converge in the question of whether or not one should consider, in deciding on the symmetry group of a pattern, the local idiosyncrasies—like **color, interlacing, and small infill designs**—which produce **local variations in symmetry**. This leads us to the basic question of whether the original artisans were interested in those local conditions or more with the overall symmetry of the design as a whole[55], and, therefore, **whether or not symmetry groups have been of any relevance to the decisions made by the designers** while selecting and positioning their respective designs. Branko and Zdenka Grünbaum and G. C. Shephard argue that:

> "...it seems likely that the artisans meant to create ornaments in which each part is related to the immediate neighbors in some specific way (and not by attempting to obtain global symmetries of the infinitely extended design)..... Of course **'local'** uniformity frequently leads to **'global'** symmetry, but it may well be that the former was the main objective while the latter was an **accidental consequence**."[56]

They conclude that the mode of **thinking in terms of symmetry groups was totally alien to the artisans (and mathematicians)** of Antiquity and the Middle Ages, and that the role of symmetry group analysis is limited to **description and classification** and cannot replace other traditional methods for the visual analysis of ornament and for understanding the artisans' intentions.[57]

But even if the assimilation of crystallographic theories within the discipline of ornament could not have been possible for the traditional

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[54] See Grünbaum and Shephard, "Symmetry in Moorish and Other Ornaments", p.641

[55] This brings to mind the aesthetic question raised by Grabar (discussed earlier in this chapter) about the notion of "tension" between the artisan's interest in the effect of the design as a whole and his manipulation of the constituent parts.

[56] Opcit., pp.651-652

[57] Grünbaum and Shephard, "Symmetry in Moorish...", p.652

craftsman, the method of crystallographic analysis remains to be, not only a convenient means for perception and classification of historical examples—as claimed above—but also as an extremely promising method for the art of making new designs. The problem, however, is that the field is still in its infancy. One particular aspect that is not yet seriously addressed is the probable **relationship between the symmetry group of individual patterns and their relative positioning in an architectural monument.** A possible scenario could include the analysis of all the ornamental patterns of a given monument, and classifying them into symmetry groups mapped against their corresponding location (within different floors, walls, gates, screens, balustrades and other architectural elements), or the different kinds of materials used. In this way one might arrive at generalizations about the frequency of use of certain symmetry groups in the monument as a whole and in parts, as well as questions about the possibility of correspondence between certain symmetry groups and specific materials. More general conclusions might be concerned with common geometric properties between patterns as a whole (or between smaller groups of patterns, or patterns with an adjacency situation).[58]

Despite important contributions made by H. Lalvani, H. Sayed, A. K. Dewdny and others, another application of crystallographic analysis which still awaits further development is the field of **computer generation of patterns.** Simple methods can start with feeding the fundamental unit to the computer which will then repeat it indefinitely according to any one of the 17 symmetry types. Other methods could begin with fixing a particular grid, and a number of points on the grid, then connecting them in endless ways using different symmetry operations[59] (fig.33). But more interesting

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[58]A similar methodology was adopted by M. Nasri in The Mausoleum of Akbar: Understanding the Two-Dimensional Geometric Patterns, unpublished paper, M. I. T., 1988

[59]See A. K. Dewdny, "Computer Recreations: Imagination Meets Geometry in the Crystalline Realm of Latticeworks", Scientific American, June 1988, pp.120-123

and fruitful results could be achieved when the connection of points is continuously and systematically controlled and changed. This will lead into a continuous transformation from one pattern to the other with the infinite range of possibilities in between (fig.34). Describing such a method, Lalvani remarks:

> "Systematic changes in the sequencing of connected points, produced a lineage of **transforming patterns** on the computer scroll. Also, for each pattern in any lineage, temporal transformations of the same

Fig.33: Various stages in the construction of a latticework according to A. K. Dewdney
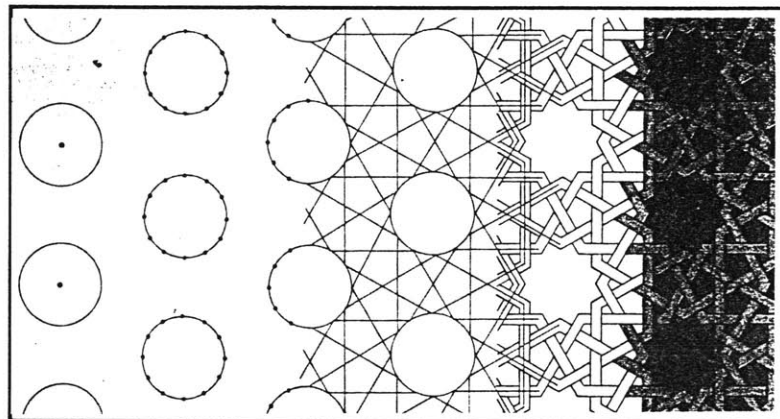
Fig.34: Computer generated sequences of continuous transformations of patterns (after H. Lalvani)
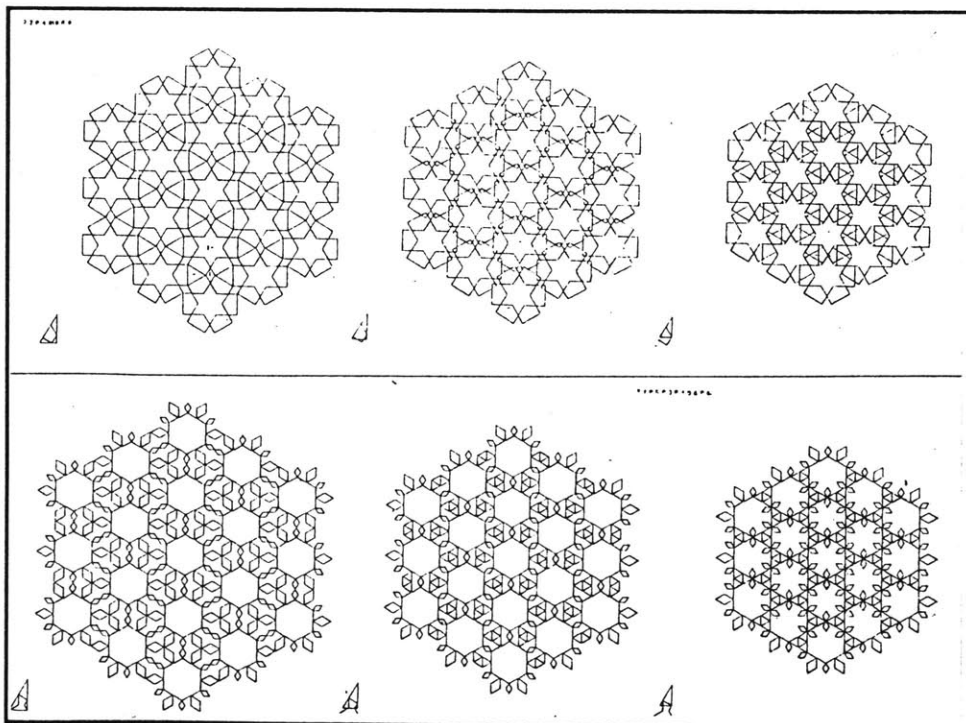
pattern were produced by sequentially altering its frequency. The shrinking fundamental region marked by the diminishing triangle, produced an increasingly self-overlapping pattern thereby **changing one pattern to the other dynamically**. I am not aware that such a concept of **dynamic spatial transformation** was known to the Islamic builders."[60]

One should note, finally, that the major advantage of computer aided methods is not only the systematic decoding of known patterns but also the creation of infinitely new ones. Such approaches may also lend themselves easily for educational purposes, keeping in mind, however, that intuition will always play the major role in decision making and choice of appropriate symmetry types, while the computer acts as a flexible aid for providing new unprecedented possibilities.

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[60]Haresh Lalvani, "Pattern Regeneration: A Focus on Islamic Jalis and Mosaics", The Impulse to Adorn: Studies in Traditional Indian Architecture, Marg Publications, 1982, p.133

D- SYNTHESIS

POSTULATES

A ACCEPTING THE REDUCTION of the study of ornament, or works of art in general, to that of forms and meanings, the positivistic approach hypothetically disregards the question of meaning, whether socially related or more particularly bound by the faith, and concentrates instead on the **formalistic aspects of the design** itself. Leaving aside the possible associations of meanings, the assumption becomes that nothing would remain in ornament other than the web of **structural relationships** between the different elements, i.e. geometry itself. Ornament is thereby reduced to a rational phenomenon but retains its property as a visual field where one could look for **harmonies of proportion.**

By virtue of its rational and structural nature, therefore, **geometry would lend itself easily to a medium through which we can organize and classify our perceptual experience of ornament.** And as a means of realization of the ornamental design, it should surely be at the center of any interest in **the study of the design process itself.** Understanding geometry, and ornament for that matter, in both its facets—as **a mode of perception or as a manifestation of a creative process**[61]—is the point of departure of the theoretical program under consideration.

HYPOTHESES

R ELATED TO THE THREE MAIN ASSUMPTIONS about ornament— as rationable and classifiable, as aesthetically perceptible, and as logically reconstructible—different auxiliary hypotheses are suggested by numerous scholars. As a **rationable and classifiable**

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[61]See Grabar, "The Mediation...", pp.10-11

phenomenon, it is either classified according to the physical shape of its motifs—vegetal vs. geometric—or to the inherent character of its covert organizing structure—loose vs. rigid geometry. The later method proved to be better equipped to capture the rational essence of ornament Crystallography still allows a more systematic and purely mathematical typology of ornamental patterns as means for space-filling. As an **aesthetically perceptible art,** ornament lends itself to the hypothesis of an assumed tension between a holistic and a sequential process of perception. Such an argument, however, often leads to other auxiliary hypotheses about visual illusionary effects and enigmatic properties of Islamic ornament in particular, leading therefore to cultural questions which do not help support the initial postulates. And, finally, as a **mathematically reconstructible design**, ornaments, and geometric patterns in particular, induce two kinds of hypotheses: about their generic properties and construction principles, and about logical methods for their reconstruction. Such hypotheses also vary between those which look for fundamental aesthetic properties, harmonic proportioning systems, and ways for producing them, to the wholesome application of a purely mathematical discipline like crystallography. Within the arguments of the first group there is always space for speculation and alternate explanations (proportioning rules, circles, grids,...etc.), while in the second one, the decoding and reconstructing processes are limited to finite possibilities. There is the risk in the first category of a bias to certain preferable aesthetic qualities, or to ordering systems with supportive cultural/historical evidence. And in the second extreme, there is an equal risk of a complete detachment from a cultural base and of versing oneself in pure mental exercises of construction games and tiling puzzles.

METHODOLOGICAL RULES

I N TRYING TO AVOID cultural and historical issues, the positivistic approach directs itself into a variety of rational disciplines: mathematics, crystallography, computer programming, and psychological and aesthetic sciences including gestalt psychology, and classical aesthetics. The scientist / mathematician assumes a central role.

The pursuit of a purely rational approach, away from the questions of cultural and religious interpretations, could involve the risk of imposing a scientific reading on some otherwise arbitrary aspect of design. Searchers for design method, guiding proportions and mathematical orders, in Islamic art and architecture, might easily get trapped in their own methodological biases away from the original intentions of the creator of the work of art. They could easily get attracted to the extension of a possible design procedure relevant to one field of Islamic art or architecture and generalize it onto other areas.

The major methodological problem, however, is how to account for a rational study of a specifically Islamic ornament. The aim is to deal with the Islamic concept of 'unity and diversity' on a scientific level. Efforts are directed to the search for "one" archetypical process that would explain the generation of the infinite variety of ornamental patterns, and could be extended to the field of architecture, or even generalized over the whole spectrum of Islamic art. The "oneness" of such a process is attributed to the Islamic concept of unity, and is often justified by it.

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