FORMAL STRUCTURE IN
ISLAMIC ARCHITECTURE
OF IRAN AND TURKISTAN

KLAUS HERDEG

Preface by Oleg Grabar

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Acknowledgments

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Credits
Except for a handful of historical illustrations, all drawings are original and the photographs were taken by the author unless noted otherwise.

Most exhibition photo mechanical work was done by Independent Printing Company, New York City. Large exhibition panoramas were printed by McGovern and Pivoda Photo, New York City, while all other enlargements were done by Vincent Tcholakian of Diana Custom Photographic Lab., New York City.


Page 36: Kerman, aerial view, © Geographic Society of Iran.
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Foreword

Formal Structure in Islamic Architecture of Iran and Turkistan is a sequel to another study I undertook in the late sixties on Formal Structure in Indian Architecture. This study "completes" the geographical and historical triangle formed between Iran, Turkistan, and India.

The new study is based on a travelling exhibition of the same title, of which the panels are reproduced here. Most of the panels measure 30 by 36 inches, but a few as much as 60 by 72 inches. In order to convey a visually more comprehensive view of the material presented, full-page color photographs have been added to this volume, with short text to explain the images and their context.

This foreword sets the stage for the preface by asking a central question: why undertake such a study and why do it in this way? The two parts of this central question appear to me like two sides of the same coin.

Our society assumes that the printed word commands authority, or even expresses the truth itself. This attitude dominates the everyday, and certainly academic and other intellectual discourse. As an architect and critic with an abiding interest in formal structures, I believe their study helps us to understand and design the world around us. I see images, especially drawings, as my "text." Visual discourse may be parallel, or even symmetrical, to written or spoken language, but it is more difficult to decipher, and thus one may be rewarded with the prize of a "primary discovery." Observant eyes are not enough. Meaning, to be fully revealed to oneself and to others, especially beyond what is visible, requires formulation. At times photography will serve the purpose. More likely the orchestration of photos, scaled drawings of various kinds, analytical diagrams, and explanatory text will represent an architectural condition inviting the viewer to continue the interpretations intended by the author. Sometimes, surprising new interpretations arise, even years after a particular study has been committed to paper.

To understand formal structure in architecture, it is imperative to see and experience, on site, as many artifacts, buildings, ensembles, and cities as possible. Documentation, interpretive scale drawings, diagrams, and text follow.

Instead of preempting my definition of formal structure as it appears in the preface, I find it helpful to illustrate here the significance of formal structure by referring to some readily accessible examples. Francis Bacon, the sixteenth-century English philosopher, compared the shapes of tables in terms of their effects on promoting, or inhibiting, a certain kind of discourse.

A long Table, and a square Table, or seats about the walls, seem Things of Forme, but are Things of Substance; for at a long Table, a few at the upper end, in effect, sway all the Business; but in the other Forme, there is more use of the Counsellours Opinions, that sit lower.

(from "Of Counsell")

The perceived significance of a long, rectangular table depends upon a specific hierarchical political/social symbolism—that of a monarch sitting at the "head" of a long table, projecting or receiving the predominant axis. The "foot" of the table usually remains empty. A leader sitting at one of four equal-length sides of a square table would inherently project a less hierarchical power, and would be open to greater influence from his council.

The myth of King Arthur and his knights is inseparable from the idea of the round table, symbolizing in literary terms what is implied by its geometry: that a circular table is as likely to promote good will as an oblong table is to promote confrontation.

In contradistinction to these examples, the President of the United States neither sits at the head of a long table nor randomly along one of its sides, but in the middle of one side, flanked by his most important cabinet members. He thus visibly occupies the position of a chief, but, as signified by the wideness of the table, and the evenly spaced seats around it, is also "one of the team."

The shape and size of a table's simple plane may encourage or deter interaction. The following comparison between two volumes of space—a niche on a church facade in Venice, and a pit-like indentation in the floor of mosque in Isfahan—illustrates formal structure "in action." It is through children's interpretation of these spaces, designed for other purposes, that their formal structure becomes apparent.

The Venetian girl instinctively "saw" the niche as her little house, or perhaps a store. A combination of several architectural elements makes the found space her own. The bar screen, meant to keep grownups out, happens to be proportioned to her size so that she can safely peer out into the more dangerous world beyond, firmly grasping the two vertical bars as an adult would a door frame. In alignment with the protruding base plane of the the adjoining pilasters, the assembly of horizontal and vertical bars becomes a transparent plane. By extending into and past the niche at bar height, the top of the stone base implies a ceiling over the little house or room. Finally, the paving pattern of the piazza continued into the niche, thus negating the division between public space and the girl's private domain. Had the bar screen been installed one foot deeper into the niche, its use as exterior wall to the house would have been impossible; therefore, this found space would have had an entirely different character, inviting other spontaneous responses.
Although the example from Isfahan is less complex, the instinctive use of the found space by the six boys is similar to that of the Venetian girl. The indentation, instead of being vertical and forming a niche, is horizontal, resulting in a kind of pit. Both spaces are volumes with defining planes perpendicular to each other, but because of their different orientations, the edge or “rim” increases in importance at Isfahan: it is where the boys sit. Although they are neither quite inside nor outside the space, in formal structural terms it is similar to the threshold created by the bar screen facing the piazza at Venice.

Other specific architectural elements, when combined, make this space an almost irresistible gathering place for the boys. The proportions and dimensions of the trough, as large as an oversized bathtub, provide a safe and spacious environment. The checkerboard tile pattern follows the hollow of the pool-like space, falling from and rising toward the original floor level, as if the ground had given way to a mighty force. The overall effect blurs distinctions between the inside and the outside, encouraging the boys to conceive of the “boundary” in a variety of ways. In both instances the subtle ambiguities of these places, in Venice and Isfahan, are the key to their success as found spaces.

In order to provide a more complete answer to my initial rhetorical question about why and how to undertake this study based on visual discourse, we need to shift our focus. Why am I concentrating on the Islamic architecture of Iran and Turkistan in this book? I regard this region’s traditional architecture as particularly rich in its expression of indigenous architectural issues, which can provide new insight into our own architectural culture and that of others. And lastly, this architecture most convincingly demonstrates the power of formal structure.

If asked to select one representative drawing to describe the aim of this study, I would choose the section-axonometric from the discussion “Bazaar: Amenity” (Page 33). I had an inkling of the place’s importance as I was measuring the spaces on opposite sides of the Isfahan bazaar on a quiet Friday afternoon, the Moslem day of rest. From the raw data brought back to Columbia University in the fall of 1975 to the final decisions about which elements should be shown and how—from black for solid sections to dots for edges “ghosted in” for information or gestalt reasons—was a long road, finally completed in the summer of 1986.

If you now turn to “Aspects of Formal Structure” and its supporting drawings, diagrams, and photographs (Pages 34, 35) accompanying this spatial ensemble, and then “overlay” the discussion on found spaces in Venice and Isfahan, you can begin to fathom the reasoning behind each graphic decision. Among other considerations, multiple scenarios were imagined, as if by analogy played out by children.

I single out this particular drawing from Isfahan because it contrasts intimate and public spaces with the city fabric as a whole, a fragment of which is visible in the rooscape. Two public institutions face one another on axis across the city’s commercial artery, enhancing each other’s essential characteristics. When seen from the intimacy of the fountain space, the mosque and its floodlit forecourt appear even more monumental. In turn, the intimacy of the fountain space becomes more apparent when viewed from the immense mosque portal. The bazaar’s order and stability, both literally and figuratively, contrast with the individual stalls, as well as the surrounding and ever changing city fabric. Lastly, the combined interaction of tectonic elements: large-scale pilasters, arches, domes, poché solids, and small-scale steps, benches, columns, pavement, and screenwork form paths of light, places of dark coolness, bustle, and rest. This drawing, as well as others, uses graphic means to make visible the invisible, such as climate, legal systems, and social customs, which are discussed in the preface.

New York, October 1989
Klaus Herdeg

*The table discussion is from my Decorated Diagram published by MIT Press in 1983*
Mosque Al-Hakim, approaching the main courtyard through one of several entry spaces
It is quite true, as Klaus Herdeg points out in his foreword, that drawings and, to a degree, photographs are a text, his text, introducing readers or “lookers” to the traditional and monumental architecture of two very distinct areas: the cities on the southern and western edges of the central Iranian wilderness and the large urban centers beyond the Oxus, on the old trade route from Iran or India to the Far East. Why is it reasonable to show these two regions together? And what sort of statement about architecture is made by these drawings?

Iran and Turkistan, or Iran and Turan, as the classical Persian epic tradition has it, were two poles of ancient Iranian culture. One, centered in the relatively protected vast oases of Isfahan, Nayin, Kashan, Shiraz, and Yazd, on the mountains overlooking Iraq, and on borderline cities like Ardistan, Zavareh, or Niriz, had been the homeland of the ancient Iranian dynasties of the Achaemenids and the Sassanians. Late in being converted to Islam, it became the center of Seljuk rule in the eleventh century. In the sixteenth century the dynasty of the Safavids, which unified the Iranian world more or less within its geographical and cultural borders of today, established its capital in that region, in Isfahan, and transformed the city into one of the jewels of Islamic and Iranian architecture and urbanism. Western and southwestern Iran, the ancient land of Fars, was also the homeland of Hafez and Saʿadi, the great lyrical poets of classical Persian literature.

Quite a different destiny befell the northeastern Iranian world, the traditional provinces of Khorasan and Transoxiana. This was the extreme limit of Alexander’s fantastic journey, and seemed then at the end of the known world. For a long time its most lively culture was Buddhist, but all other religions and sects are represented in the tumultuous centuries preceding the arrival of the Arabs and of Islam early in the eighth century. Until the ethnic and cultural (but not necessarily political) stabilization under Uzbek rule in the sixteenth century, it was an area of constant movements of people, goods, and ideas. Brutal Mongol invaders and more peaceful Turkic tribes went through on their way to other places. Locally bred or imported dynasties succeeded each other in an order so confusing that it is often impossible to remember who was ruling city at what time. New capitals were created, like Ghazni or Shah-i Sabz, but ancient cities like Samarkand or Herat were constantly built and rebuilt. It is there that the Persian epic tradition acquired its masterpiece when Firdawsi completed the Book of Kings, but it was also, at least until the sixteenth century, an area of international scientific and cultural achievements by scholars from all origins. Vibrant and inventive, creative, and subject to all sorts of influences, it was an outpost in inner Asia of western Asian cultures, the space of passage of pan-Asian phenomena like Buddhism or silk, and occasionally, as in the brilliant fifteenth century of the Timurids, a major political and artistic center.

The monuments shown in this book come, for the most part, from the fifteenth century in Turan and from the early seventeenth in western Iran. These were the centuries when a truly Iranian synthesis was achieved out of a most diverse range of motifs and means of construction and planning. The imperial rules of first the Timurids and then the Safavids provided a patronage which in effect formulated the classical pre-modern ways of official Iranian architecture: competing contrasts between surfaces and volumes, brilliant colors in many techniques of execution, double axes of composition based simultaneously on the center of the building and on its entrance, iwan, and dome as dominant terms for designing nearly anything, cascading muqarnas entrances and vaults, stunning differences between the skin of buildings and their bone structure.

Much can and needs to be said about the architectural values of these buildings, about their evolution over the centuries, about their function and meanings within their own time, and then about their significance today to those who live with them, who still partake of their presence, and to those who are away, both physically remote and culturally different from the patrons and users, past and present, of these spaces. What can all these readers see in the documents gathered by Klaus Herdeg? What can they “read” in them? The primary value of these drawings and pictures does not lie in the specific information they provide about buildings that are for the most part well-known, like the Royal Square of Isfahan and its attendant masterpieces. It lies rather in the choices of interpretation suggested or implied by the drawings and the often unexpected sections and axonometric views. Several drawings with different emphases of the same monument, cuts through buildings that suddenly emphasize one section over others, visions that are only available to birds or to angels, these are exciting ways of looking; they all illuminate a monument or compel a focus not normally available or expected. And they are all true, as they are all reflections of the reality of the buildings with which they deal.

This is precisely where these drawings raise fundamental questions of architectural perception. If they are all true but so different, are they really reflections of a building and of an ensemble? Or are they, perhaps, the choices of a contemporary artist-architect who demonstrates his enthusiasm and depth of feeling for buildings but not necessarily the truth of something put together many centuries ago? The question is not simply a pedantic one of figuring out whether the past has been properly understood and whether a new and artificial image is faithful to that past. For in reality our whole perception of architecture is involved. However complex a given axonometric drawing, it, like any photograph, is a two-dimensional image on a page. But, whereas a photograph, however doctored, is ultimately true to an instant of the reality of a building, a drawing never represents something seen at the monument. It is a choice and, like all choices, it eliminates something in order to make something else clearer. The fascination of Herdeg’s drawings is that he acknowledges the partiality of drawings by offering several possibilities without choosing between them. A cop out perhaps, but in reality it acknowledges that no one has the right to impose a single view of buildings, and that a major work of architecture (perhaps any work of architecture) is too rich a creation to be shown in one way only.

The lesson here is a philosophical and perceptual one. We know too little about the ways in which the brain, trained or not, rebuilds the segments of truth given to it by drawings and photographs. And, ultimately, what is at issue is the nature of the truth of a building, of a monument, an ethical dimension rarely raised by critics or historians. One of the numerous and exciting aspects of the images gathered and drawn by Klaus Herdeg is that they compel raising deep questions about architecture in general, not only about its representation. And it is the glory of classical Iranian architecture that its clarity and its compactness allow for the raising of profound questions about the art of building and the way we see it.
This publication and the exhibition associated with it propose to explore public and private buildings of Islamic cities in a geographically and historically interrelated region—Iran and Turkistan. It also examines the urban fabric, itself an all-encompassing “building,” giving visible expression to the Islamic concept of umma, or oneness of all. According to umma, the individual and the community are inextricably interdependent.

The principal purpose is to illustrate and explicate selected formal structures, rather than to give a traditional historical account.

The eye of the viewer being principally addressed, the term formal structure as used here calls for definition. Formal structure is the underlying order and its effects on any natural or man-made object or phenomenon based on inherent formal properties such as symmetry (axiality), hierarchy (progression), climax, repetition, and others, to which may be ascribed analogous functional and symbolic attributes and values. While formal properties are fixed through time and different cultural conditions, values are not. In other words, the term couples definitive formal givens with their latent interpretations and transformations realized through human instinct, imagination, knowledge, and ingenuity, which, in turn, are often governed by tradition, time, and place. However, no interpretation or value judgment is possible without first “recognizing,” that is, seeing, inherent formal properties and their interplay and effect on each other.

A spectrum of cities and city components is displayed to allow a comparison in size and purpose, past and present. An imperial capital is thus contrasted with a provincial city. A public building in Iran is set against its counterpart in Turkistan.

The geographic area encompasses the Iranian central plateau and, to the northeast, Turkistan in central Asia. Turkistan spreads from the Caspian Sea through Soviet Uzbekistan over the Pamir Mountains into the Takla Makan Desert in Sinkiang Province in China. The chain of cities formed by Kashan, Nain, Isfahan, Yazd, and Kerman, with Shiraz to the south, represents a wide range of urban settings of varying prominence and raison d’etre. The same is true of a parallel chain in Turkistan: Khiva, Bukhara, Samarkand, and Kashgar.

The first half of the publication and exhibition covers Iran (16th c.—19th c.), the second half Turkistan (12th c.—19th c.). The two rulers commonly associated with these areas are Shah Abbas I (1587–1629) and Tamerlane (1336–1405), respectively. Because of its non-chronological objective and format, the earlier and later examples mingle freely, emphasizing the stability of certain formal structures and shedding light on the astonishing continuity with which life and architecture imbue these cities and buildings.

The construction process is perpetual as the use of buildings is always adjusted to new conditions. Cities and buildings get built with a specific program and civic purpose in mind; they may be demolished and restored; their original assignments may change, and still, as long as their fundamental formal structures are recognized, they live on.

Whether understood historically as artifacts or as “found objects,” there is a hierarchy of urban spatial components governed by the same planning and design principles. Court and street are paramount formal and functional elements on all levels of consideration. For instance, the rooms in a house may be separated by corridors as the clusters of houses and other buildings in a neighborhood are divided by narrow streets and alleys. Looking at the city in its entirety, one often finds a continuous bazaar/corridor winding its way between all courts, large and small, important and less important.

A standard Western definition of urban form cannot be applied to the Islamic cities of Iran and Turkistan. This is because the spatial elements are forever repetitive, though varying in degrees of relative anonymity and monumentality, and because the city is an uninterrupted fabric of all kinds of buildings and places. While the elements are hierarchical in themselves, the city as a whole presents an image of collective disarray—itself another order. One layer of this order is the pious institution of Waqfs, which plays a major role in the formation of the Islamic city. A Waqf is a permanent endowment in the form of land or other immovable property—like bazaar stalls, caravansaries, and public baths—which income is used for “good” purposes compatible with Islam; for example, maintenance of buildings such as mosques, madrasas, hospitals, and fountains.

The formal structures presented here permit different interpretations of form as well as content. They also show something about the making of architecture—past, present, and future. For these reasons, this work is conceived as a kaleidoscopic view.
Izahan, Maidan-i-Shah, looking from one of the minarets northward across the central court of the Shah Mosque along the Maidan and past the imperial porch (Ali Qapu) into the city fabric.