

## THE POETICS OF ARAB-ISLAMIC ARCHITECTURE

In a recent study of classical architecture Alexander Tzonis and Liane Lefaivre proposed architectural scansion, or the methodical analysis of ways of putting formal structures together, as a way of joining a cultural tradition and enjoying the architecture of the past.<sup>1</sup> Given the current interest in culturally responsive architecture, a parallel analysis of historic Arab-Islamic architecture would not be out of place. Not only can such a "reading" or interpretation of an architectural tradition be as much of a creative exercise as its "writing" or production; it may profitably lead to the incorporation of such values of traditional architecture as are seen to be still valid into the buildings of the future. We shall be dealing here with the symbolic or secondary function of Arab-Islamic architecture, as against the utilitarian or primary one.<sup>2</sup>

### ARCHITECTURE AS RHETORIC

The communicative value of architecture was recognized by Arab philosophers and exploited by political leaders early on. Ibn Khaldun (1332-1406) distinguished between the primary purpose of architecture, which was to construct a protective screen against intemperate climates, and its secondary function, which he saw as a display of wealth, power, and paternalistic concern for their subjects by ruling elites, engineered through the use of complex geometry, monumental scale, fine craftsmanship, and intricate decoration.<sup>3</sup> While the first caliphs were sensitive to the contradiction between monumental architecture and the Islamic values of asceticism and egalitarianism and sometimes acted to prevent its use, the Umayyads were quick to seize on architectural rhetoric as a means of asserting Arab and Islamic identity and furthering their political ends. Al-Walid is on record as requiring his mosques, and probably his palaces, to be "a wonder to all the world."<sup>4</sup> An Arab poetics of architecture began to emerge during his caliphate and those of his Umayyad predecessors. "Poetics" is here used in a double sense: as a system of forms and compositional rules comparable to those which are used to spin words into poetry or

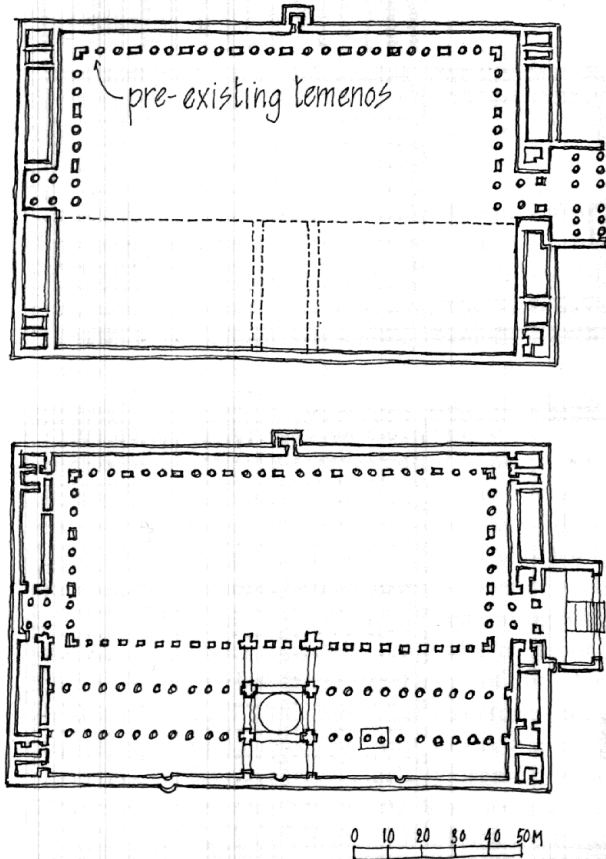
sounds into music; and the poetic utterance or tragic discourse to which the forms so composed are addressed. The forms, techniques, and materials that were drawn into this system were initially mined from the subject cultures but ultimately fused into an authentic expression of the Arab and Muslim world vision.

This poetics was rooted in the need to carve out oases of order and coherence out of a world which was perceived as being perilous and chaotic, and to wall them in to protect them, creating the temenoi of Hellenistic cultures and the harams of the Arab world. In classical architecture the protective wall was eventually eroded, but this was far from being the case in the Arab-Muslim world, where the cult of ritual cleanliness and purification associated with sacred enclosures is as much a part of daily life today as it was in early Islam and before. While Western man thought in terms of the Aristotelian poetics of beginning, middle, and ending and so of a temporal sequence which eventually breaks through the temenos wall, Arab-Muslim man was more concerned with the concepts of center and periphery and so tended to reinforce the integrity of the enclosed space. It is no accident that the construction of that most seminal of Umayyad monuments, the Great Mosque of Damascus, began with the appropriation of an existing temenos wall and the restructuring of the space inside it according to an order that responded to Arab needs and sensibilities. According to one theory, the columns of the Christian church which stood in the middle of the temenos enclosure were taken down and re-erected in new positions to carry the arches and roof of the new mosque.<sup>5</sup> What was involved was not so much the setting up of a new order as the reiteration with unfamiliar materials of the same kind of order which the Prophet and the early Muslims spontaneously used to work out the form of their mosques and houses, and newly sedentarized Bedouins instinctively use to build their first permanent dwellings.<sup>6</sup>

In spite of this fundamental difference in conceptualizing space, the methods employed to establish formal order in either tradition boil down to the same basic operation: that of structuring the selected space accord-

ing to some system of constraining lines, within which recurring unit forms, meaning those sharing similar or identical shapes, are then deployed.<sup>7</sup> On this point there is firm evidence that in Islamic as in Western cultures monumental buildings were carefully and sometimes ceremoniously laid out on the ground, often in the presence of the patron, and in many cases conceptualized in the form of drawings following regulating grids.<sup>8</sup> Culture-specific differences arose from the kind of formal structures, unit forms, and rhythmic patterns that were habitually used.

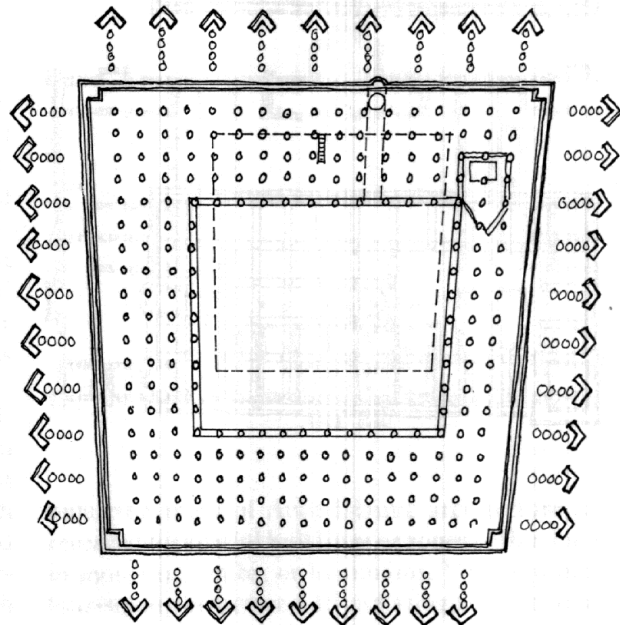
Of the Umayyad monuments, both the Great Mosque of Damascus and the reconstructed Mosque of the Prophet at Medina were organized around repetition structures,<sup>9</sup> but these were derived in different ways. In the former case a rectangular grid which lent itself to the construction system was obtained by successive tripartition working inward from the temenos



1. The Great Mosque of Damascus (706-15): a structuring system obtained by successive partition of an existing enclosure.

wall (fig. 1). In the Medina mosque the grid employed roughly square modules and developed from the inside out (fig. 2). In this way the memory of the Prophet's original mosque could be respected in spite of the reconstruction. The method used to generate the grid was well adapted to successive extensions around a stable core and became the formative principle for many later mosques. The neutral square grid laid out on the ground acquired directionality at the level of the ceiling to accommodate the distribution of timber rafters. In the aisle which led to the mihrab the prevailing distribution was interrupted, the ceiling was gilded, and a shallow dome was introduced at the point where it ran into the qibla wall.<sup>10</sup> The principle of discrete hierarchies between central and side aisles, obtained by subtle spatial adjustments, intensified decoration, or changes of color, was thus established in this influential mosque. A number of clues to identify the building's sacred center were planted amidst the forest of columns without making it glaringly obvious.

Beginning with the Great Mosque of Kairouan a number of elegant variations on this barely perceptible modulation of a repetitive grid appeared all over North Africa. The principle of tripartition was invoked to divide the mosque enclosure into qibla zone, prayer

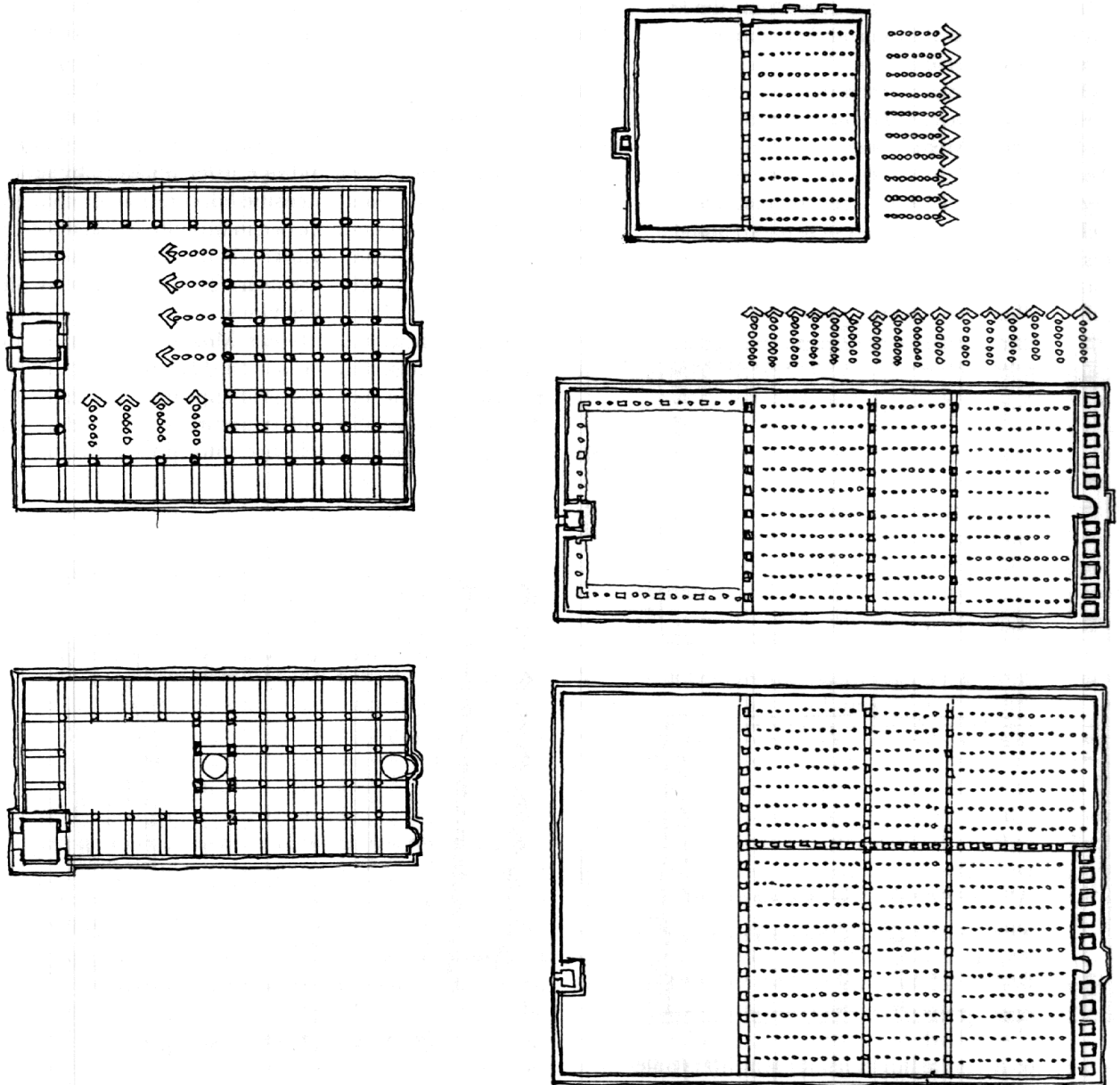


2. The Umayyad Mosque at Medina (705-9): an open-ended grid developing from the inside out. (After H. Stierlin, *Architecture de l'Islam* [Fribourg, 1979]).

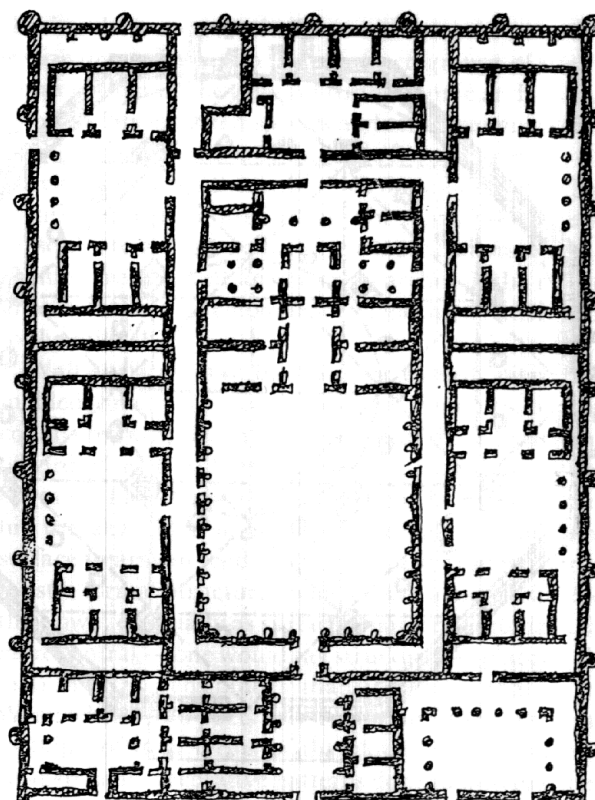
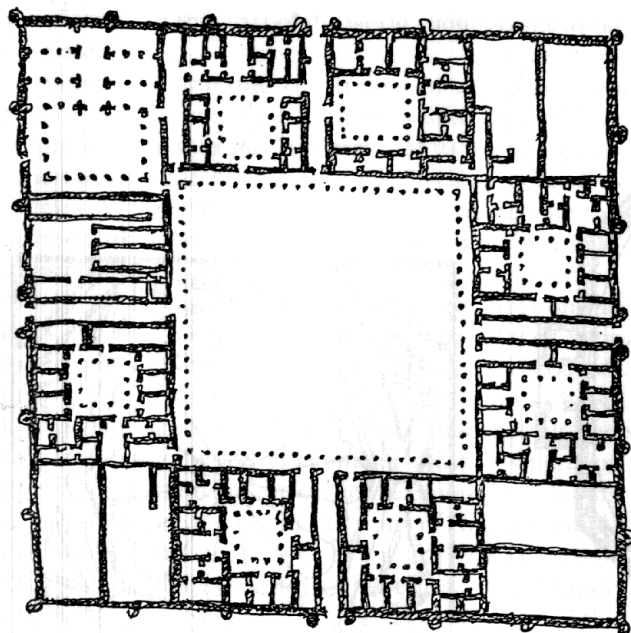
hall, and courtyard; each of these parts would then be subdivided into central and side zones, and so on until the space was divided down to its smallest module. The infinitely extendible grid lent itself quite naturally to the need to keep up with expanding cities and populations by successive additions, or ziyadas, to the congregational mosques. The principle could work both ways; to

reduce as well as to enlarge buildings as the need arose, as happened with the tenth-century reconstruction of the ninth-century mosque at Sfax in Tunisia (fig. 3).<sup>11</sup> In this openness to change we can read a poetic allusion to the impermanence of man's works, a recurring theme in Arab poetry and literature.

In the secular architecture of the Arab lands, triparti-



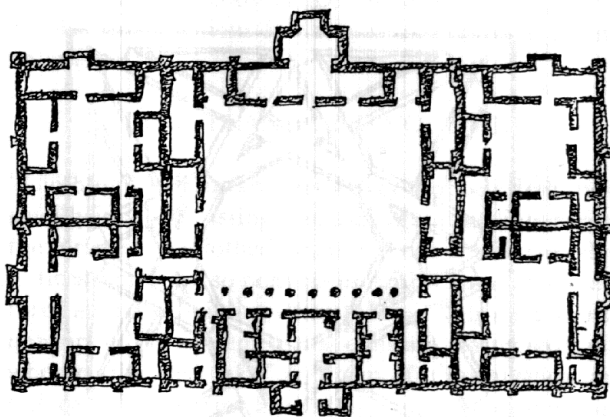
3. The Great Mosque of Cordoba (785–961) and the Great Mosque of Sfax (9th and 10th century). Successive extensions or reductions are controlled by the original grid.



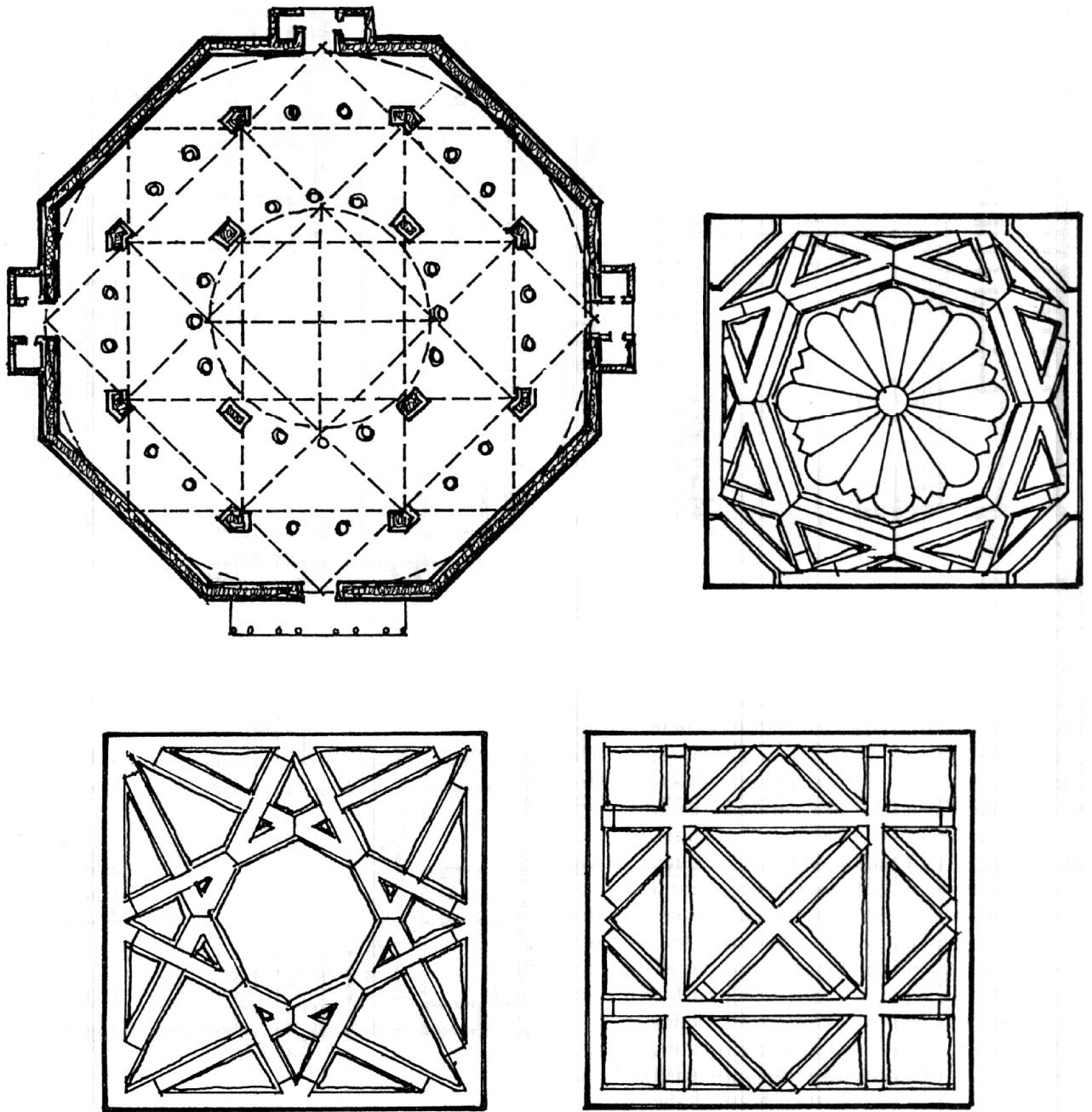
4. Nesting ground plans in Islamic palaces: (top left) Qasr al-Hayr East (early 8th century); (top right) Ukhaidir (ca. 778); (bottom right) Ashir (ca. 947).

tion is also used to embed centralized formal structures into larger units having the same form, as in the palaces of Qasr al-Hayr East, Ukhaidir, and Ashir (fig. 4). The intention seems to be to create a system of worlds within worlds, but there are other implications which will become clearer as we move on to discuss the Arab vocabulary of unit forms, namely, the conjunction of forms and structures of similar configuration but diminishing scales. This is a central concern for that arcane branch of mathematics known as fractal geometry, which applies itself to the uncovering of the order concealed in an apparent chaos, a theme which informs the origin and nature of architectural poetics itself.

To these alternative methods of generating a repetition structure, we must add a third, also tried out in an early Umayyad building, the Dome of the Rock at Jerusalem (fig. 5): the radiation structure, in which structural subdivisions and unit forms are repeated around a common center.<sup>12</sup> Such an organizing principle lends itself naturally to the Arab preoccupation with centrality, though the Dome of the Rock is unusual in having it laid down on the ground. It is more usual to encounter it overhead, superimposed on a straightforward square grid. In this combination it becomes a



recurring motif of Arab-Islamic architecture, usually reserved for special buildings or zones within buildings, in mosques, tombs, or hammams;<sup>13</sup> the conjunction of four-square structure and radiating superstructure being an obvious and virtually universal reference to the meeting of heaven and earth, and so to an *axis mundi*. Considering that Arab and Islamic cultures are so insistently God-centered the frequency with which this



5. Radiating structures: (top left) plan of the Dome of the Rock, Jerusalem (687-92), and domes from (top right) the Great Mosque of Cordoba (961) and (bottom) the Mosque of Bib Mardum, Toledo (ca. 990).



motif recurs in this part of the world should come as no surprise.

Within the ordering constraints of repetition and radiation structures Arab-Islamic architecture deploys its preferred unit forms. It is here that its poetics begins to assume its specificity and direct itself at its favored themes. Where the classical orders of architecture developed around the column and entablature, their subdivisions, contour patterns, decoration and distribution, in Arab-Islamic architecture the accent is on the arch and the architectural wall, and especially on their interpenetration in the spandrel wall. The great congregational mosques may contain forests of columns, but it is what happens in the area between their capitals and the ceiling that seems to count for most<sup>14</sup> — perhaps because in so many of the earlier mosques the columns were simply recycled from the ruins of classical buildings without much thought to the correspondence of their parts. Unlike classical architecture, Arab-Islamic architecture also tends to construct its order around the principle of similarity, rather than identity of its unit forms. Where in classical architecture we find a set of “orders of architecture” which admits only one type of arch and limits the number of variations on column shape, in Arab-Islamic architecture, as in the Gothic, there is an infinite modulation of unit forms such as the arch, and these are often encountered in the same building.

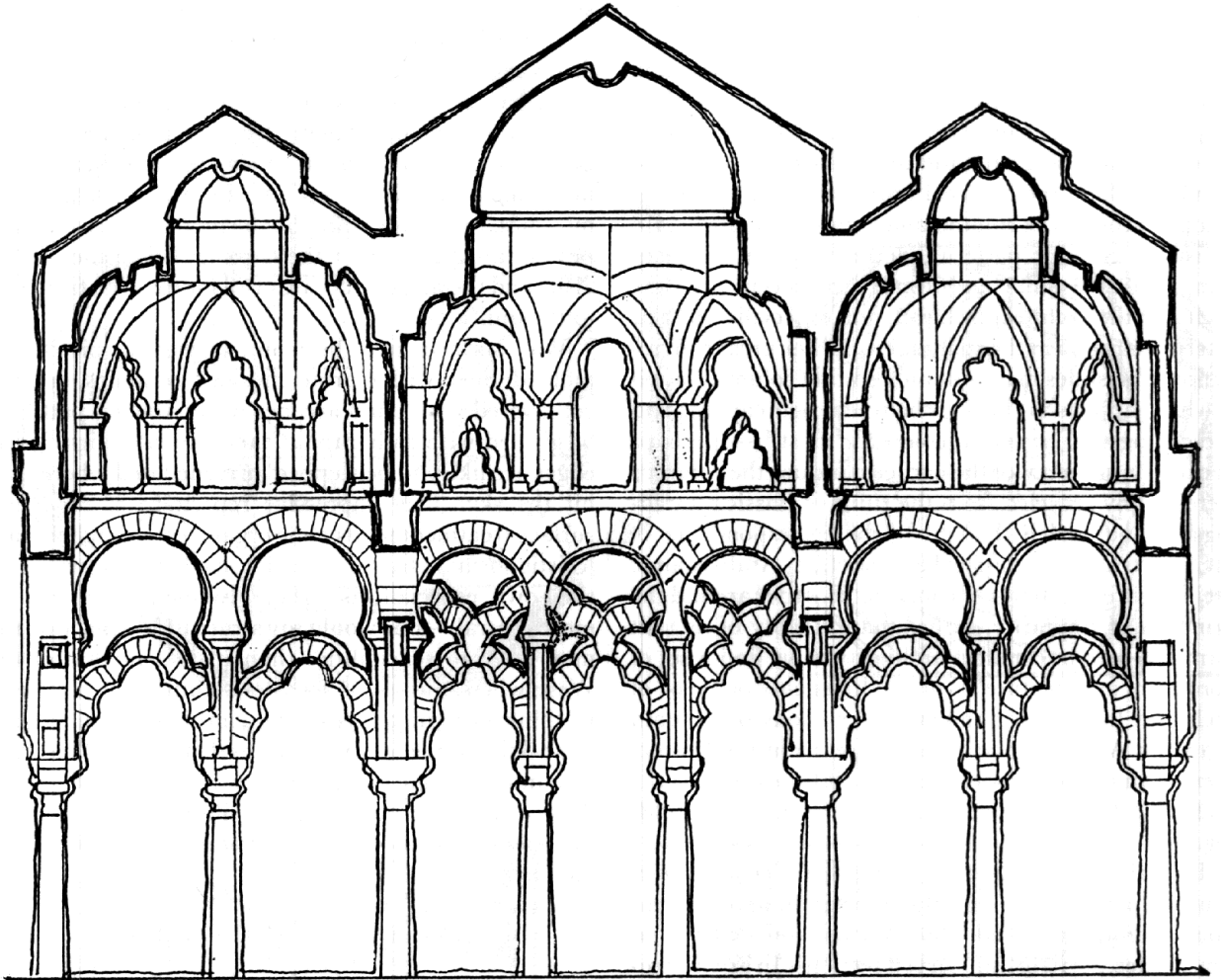
The principle of similarity hinges on the generation of contour patterns through the opposition and alternation of projections and indentations, convexities and concavities, straight and curved sections. In architectural poetics this operation is analogous to the manipulation of sounds to obtain rhyming, alliteration or contrasts in poetry, and modifications of pitch in music. To mention an outstanding example, the unit form which ultimately weaves the Great Mosque of Cordoba into a vibrant unity, the horseshoe arch, is subjected to a number of transformations which are then assembled together to produce an eloquent architectural discourse. The radiating voussoirs of the basic arch are individually defined through color contrasts which set up an opposition between their straightness and the curvature of the arch. In some parts of the building the arch is then transformed by indenting its inside edge with a series of scallops, each reproducing its overall form on a reduced scale, and adding similar forms to its outside edge. The scalloped arches which result are occasionally amplified to twice or three times their initial size, so that we end up with a family of unit forms

sharing the same generic shape without being identical in size or configuration (fig. 6). Such groups of similar forms can define the genus of Arab-Islamic architecture as well as its localized species and temporal mutations. Local transformations of the basic form, moreover, can provide the means through which the subtle hierarchies mentioned earlier are set up. In many Maghribian mosques, to give an example, the more elaborate lobate profiles are reserved for the cross-arches in the central aisle, and the most elaborate of all for the arch facing on to the mihrab.

Wall surfaces may be plain, or carved, pierced or molded; lined with marble, mosaics, ceramics, or stucco; layered with blind arcades or interlacing patterns, or girdled with calligraphic bands or moldings. Their edges are likely to be stepped or crenellated where they hit the sky. This impressive repertoire of edge and surface treatment tends to be organized around characteristic formal structures which have a significance of their own, especially as surface ornament occupies a far more central — one would say structural — place on the map of Arab sensibilities than it does in that of the West: when Arab poets speak of architecture, they tend to think of it in terms of the clothing of buildings.<sup>15</sup> Arab-Islamic decorative patterns do tend to follow their own internal logic and symmetry as if they were a cloak draped over the body of the building, often ignoring breaks and junctions in the underlying surfaces and volumes.

#### LINE, PLANE, AND VOLUME

“Clothing” wall surfaces in the way the poets describe it usually involves casting a web of regulating lines across the surface to be clothed, or, as in the case of the wooden lattices which are so popular in Arab-Islamic architecture, actually building the surface up from a dense network of linear elements. It does not matter so much whether the web takes the form of a geometrical interlace, a meandering arabesque, or an invisible framework to hold a calligraphic inscription together; often enough it is a fusion of all three. What matters from our point of view is that planes are either built up from dense networks of lines, or broken down into them, so that perceptually speaking there is a perpetual hovering between line and plane, or one and two dimensions: lines are seen as about to fuse into planes, and planes as about to dissolve into lines. This establishes yet another link with fractal geometry, a discipline which also operates in the elusive transition zones between one dimen-



6. Unit forms and their transformations from the Great Mosque of Cordoba. (After F. M. Gerhard, *Von Bagdad bis Cordoba* [Graz, 1984]).

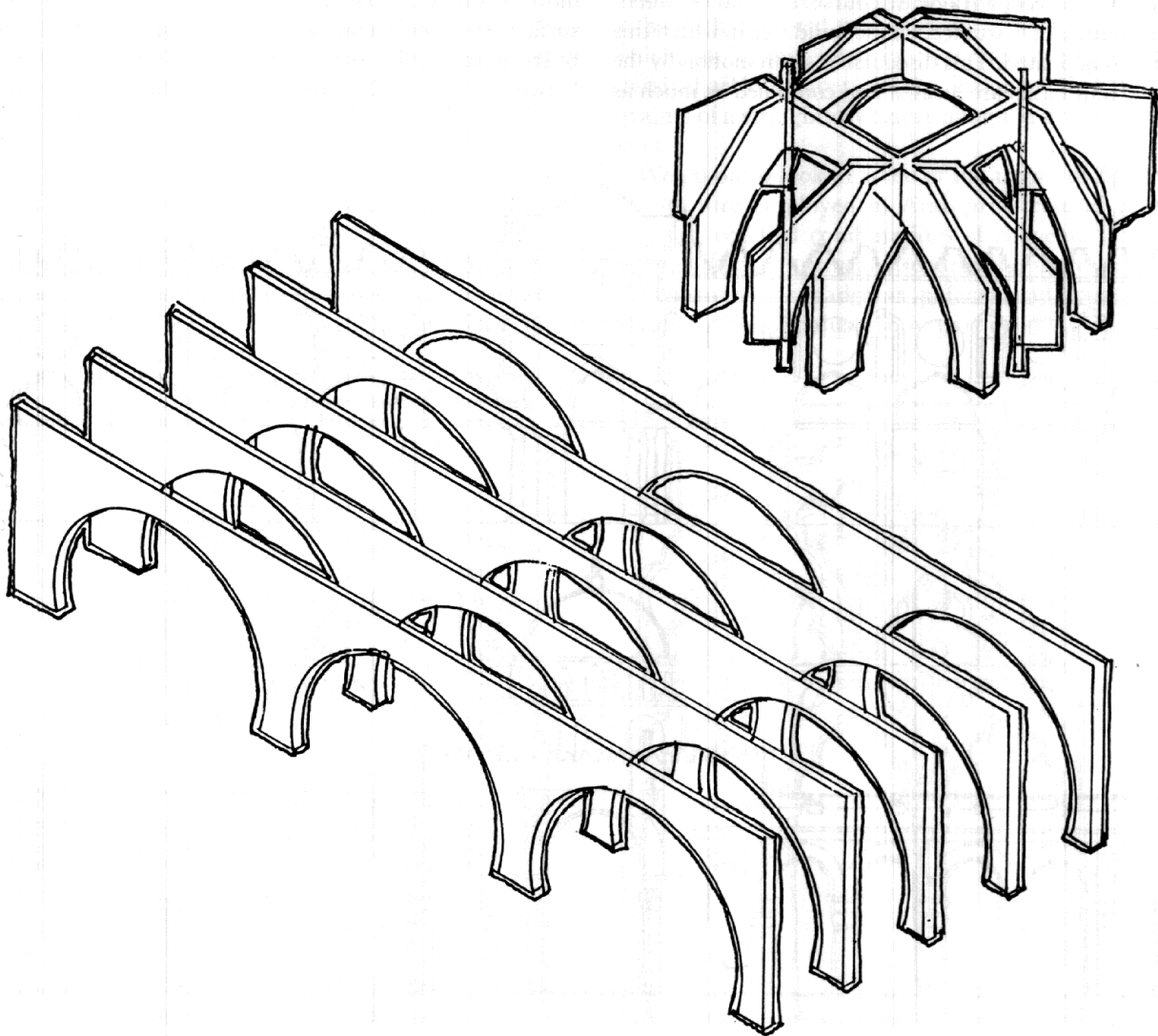
sional system and another, focusing on forms and organisms that can be seen to possess more than one dimension but not quite two, or more than two but not quite three, and so on; in other words, with flux and change, the dissolution of order and the ordering of chaos. The nesting or juxtaposition of unit forms of similar shape but varying size we identified in the ground plans of some Arab-Islamic palaces manifests itself in other ways. Lobate arches, for instance, can be imagined as circular unit forms around whose edges similar but smaller unit forms have been cut out; or, if we choose to focus on the shape of what is cut out rather than what remains, a sector of a circle throwing out similar but smaller sectors around its edge. In much the same way, the objects and organisms analyzed by fractal geometry

— snowflakes, fern leaves, and so on — take shape by tacking on ever smaller versions of the same formal principle around a nucleus of the same shape. Crenellated walls can similarly be explained as an interlocking of “positive” crenellations and “negative” intervals sharing similar or identical unit forms. Moreover, the thematic forms of Arab architecture and decoration tend to spread across differing genres and materials; the same star patterns, for instance, appearing in architecture, woodwork, metalwork, pottery, and textiles, so that differently scaled variations on the same formal theme are likely to come together in ever-changing combinations of color and texture, producing a fugitive environmental coherence that can also be seen to have fractal characteristics.

Arab-Islamic architectural poetics also builds bridges across the boundary between plane and volume. The roofs of many of the great mosques of the Arab-Islamic world are held up by interminable progressions of diaphragm arches, in effect serial planes<sup>16</sup> repeating the arched forms cut out of them both laterally and in depth. They are perceived as closely spaced slices of a solid vault, so that as the gestalt factor is invoked to complete its missing parts, the imaginary vault, or series of vaults, is intimated without being actually constructed, an illusion that dissolves into a different spatial experience as soon as the line of vision is

shifted through a right angle (fig. 7). Serial planes can be aligned parallel to the qibla wall or transversely to it, producing alternative ways of accenting the axis of the mihrab without changing the same mosque typology. Just as the arches cut out of a series of planes can suggest a tunnel vault if the planes are closely spaced behind each other, they begin to suggest a dome if the planes are made to intersect according to some radiating pattern, a device which was taken up and elaborated with great virtuosity in Spain and the Maghreb.

Many tenuous and ambiguous spatial effects can thus be produced by the manipulation of a planar unit form



7. The generation of spaces and volumes by arches repeated in serial or intersecting planes.

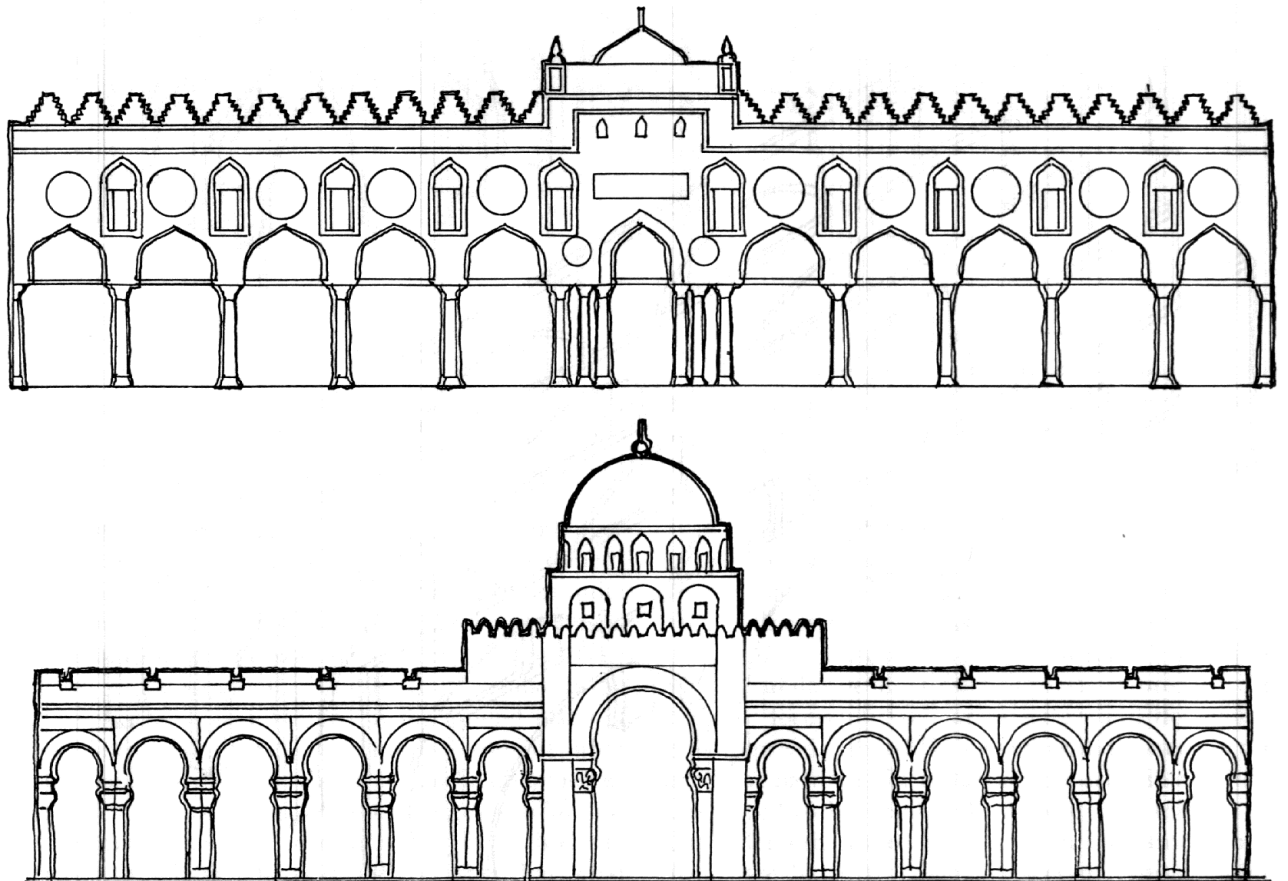


like the spandrel wall along repetition or radiation structures. Even muqarnas vaults and surfaces can be reduced to infinitesimal spandrel walls which are bent through a variable angle down their center, and then repeated and combined according to a variety of structuring schemata. To recapitulate, Arab-Islamic architecture deploys a poetics which operates at the interfaces between line, plane, and volume and habitually conjoins unit forms of similar shape but differing size. Through this intuitive fractal geometry it instinctively reaches out to the themes of growth, change, the ordering of chaos, and the order concealed under an apparent chaos. The philosophical vision which is implied bestows the status of a tragic discourse, a visual comment on the nature of existence, on the buildings in which this poetics is activated. This discourse is set in motion by the way its unit forms are located and combined as much as

by their shape. We thus need to consider the use of metric patterns, meaning the rhythmic disposition of the unit forms within their ordering structure, and architectural motives, or the combination of unit forms into "super-forms" to be repeated in the composition.

### METRIC PATTERNS

Metric patterns in architecture are analogous to the steps of a dance, the orderly succession of stressed and unstressed syllables in poetry, and the alternation of accentuated and non-accentuated sounds in music. Elements like columns, piers, or windows assert themselves more readily than the empty spaces or stretches of wall surface between them and can be considered as the beats of an architectural composition, with the spaces between them as the intervals. Looking for such pat-



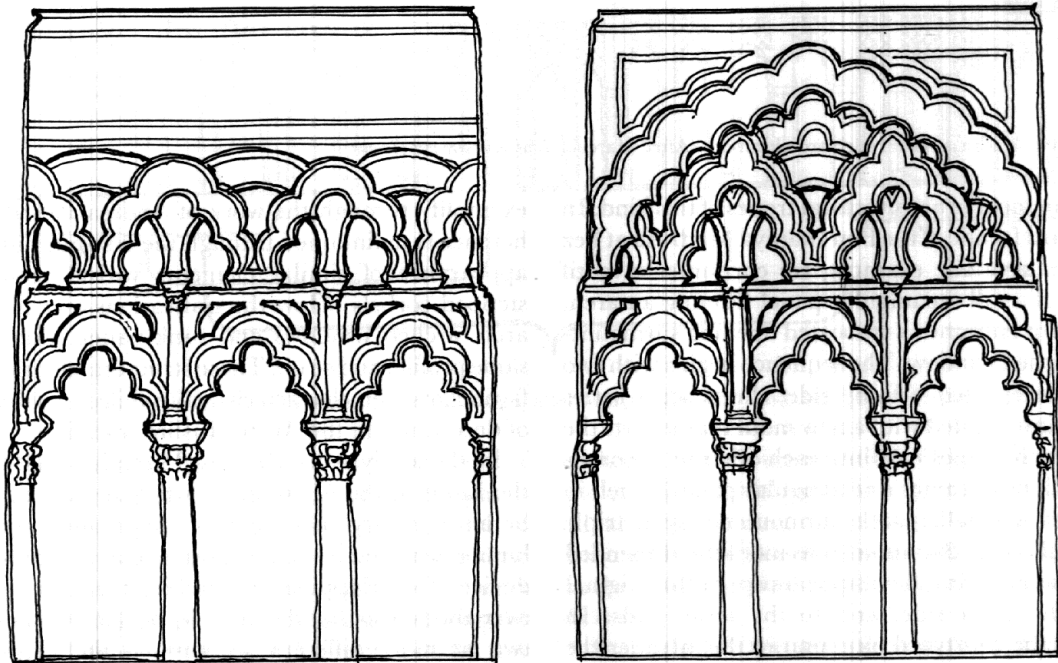
8. The use of architectural motifs to elaborate and interrupt rhythms; arcading in the mosques of al-Azhar and Kairouan. (After Gerhard, *Von Baghdad bis Cordoba* and Stierlin, *Architecture de l'Islam*.)

terns in Arab-Islamic architecture we come across repetitive rhythms set up by seemingly endless progressions of equally spaced columns, piers and arches; but subtle modulations of these simple metric patterns can also be identified. Thus in the mosques of Ibn Tulun and al-Azhar we find alternating sequences of niches, roundels, and colonnettes interwoven into the dominant simple rhythm of piers and arches (fig. 8). In the case of the latter, as in the Great Mosque of Kairouan, centers are indicated by combinations of coupled columns and amplified or reduced intervals. In each case we are confronted with an architectural motif, that is, with a standard grouping of architectural elements which is either repeated to counterpoint a simple overall rhythm with others developing within its main divisions, or inserted at one point so as to interrupt it and so mark out a center.

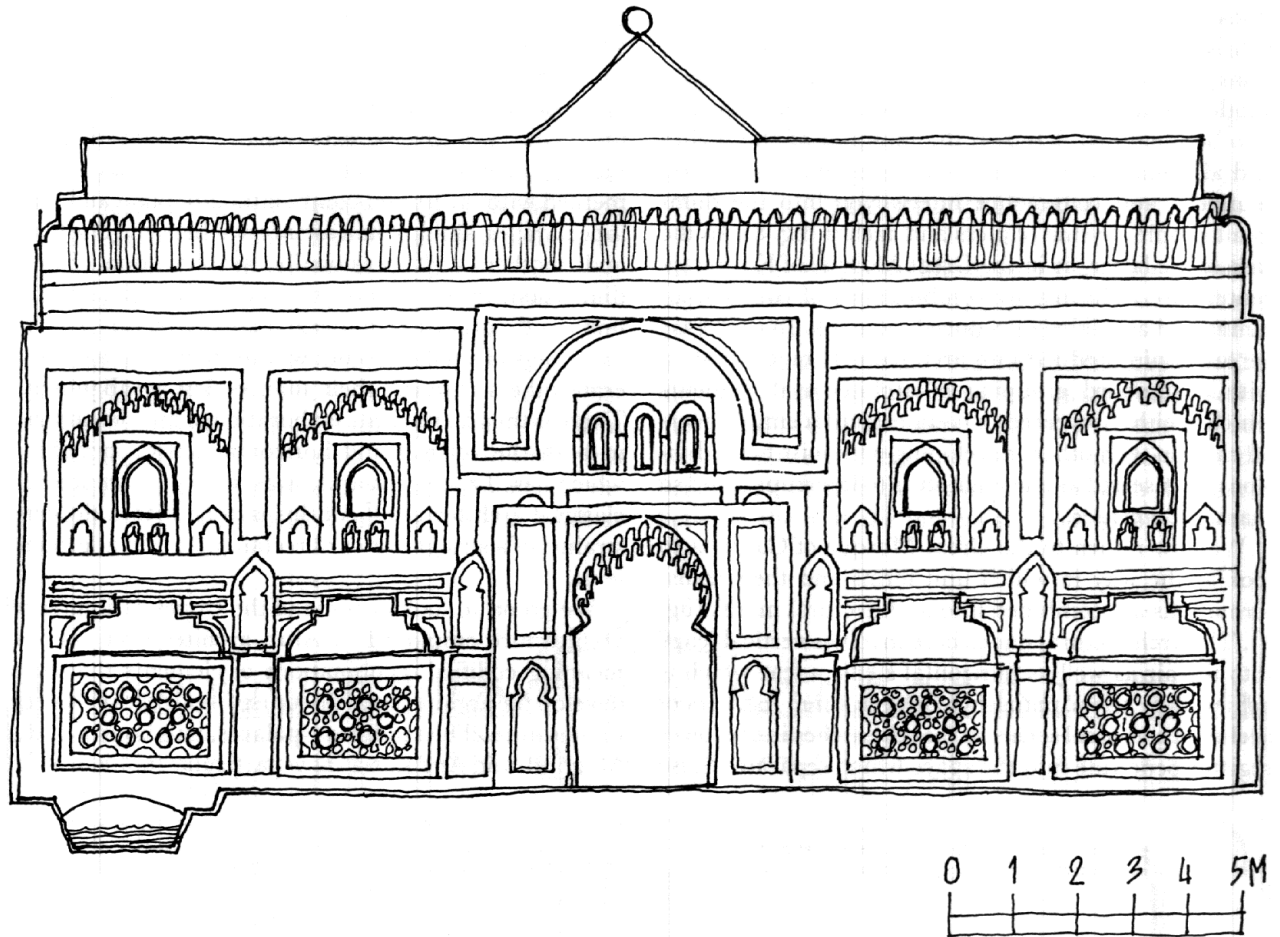
We now return to the Great Mosque of Cordoba to look at the way in which unit forms and their transformations are combined into architectural motifs (fig. 9). The architectural dance here involves vertical leaps into the air as well as horizontal steps, a feat which is achieved by overlapping two or even three registers of arches in a vertical sense, so that the arches in the lower register penetrate into the space which separates those

in the upper register. The combination of unit forms varies from place to place within the building according to the date of their construction and the ritual importance of the area in which they are located. The craftsmen who worked on extending or elaborating the mosque over a period of three hundred years experimented with layers and combinations of plain and scalloped arches, shifts of half an interval between one layer and another, and occasionally, amplification of arch dimensions to two or three times the size of the original units so that they begin to leap across intervals, embed groupings of smaller arches within their span and generate others through their intersection or alignment. There is thus an intricate elaboration of metric patterns in both the vertical and horizontal sense; something which, as Tzonis remarks, was rarely attempted in classical architecture.<sup>17</sup> All this is done within the constraints of a straightforward rectangular grid at ground level.

We go on to look at some of the tropes or figures of architecture employed in Arab architectural poetics, meaning codified combinations of elements that help develop the architectural discourse like figures of speech in literature. The madrasas, palaces, and houses of the Maghreb and Andalusia show particular sophistication



9. Architectural motifs and rhythmic patterns in the Great Mosque of Cordoba. (After Gerhard, *Von Bagdad bis Cordoba*.)

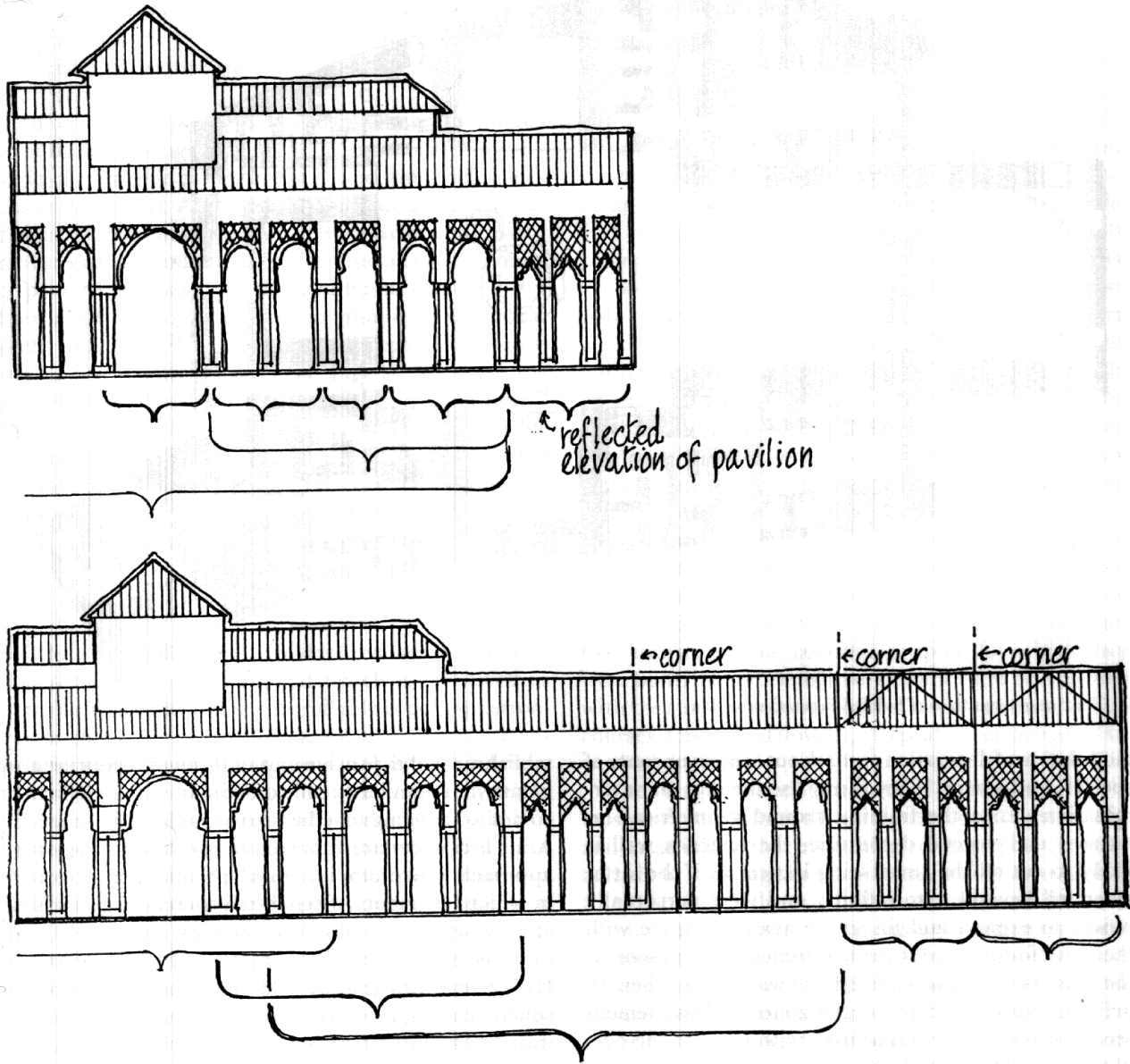


10. Bou Inaniya Madrasa, Fez: courtyard elevation. (After Marçais, *L'architecture musulmane*.)

in the deployment of architectural tropes of this kind. In the courtyard façade of the Bou Inaniya Madrasa at Fez (fig. 10), to give one example, we encounter a motif consisting of a tall rectangular panel framing an arch, which in turn enframes a trabeated opening surmounted by an arched window. The sequence begins with two such motifs repeated side by side, the nascent series being then interrupted with a new motif that inverts the order in which shapes nest into each other in the original. An arch now frames a rectangular panel, which in turn frames a smaller arch surmounted by a triple window. Following this anomalous motif the suspended order is restored with the reappearance of the original motif on the other side, and so the series ends. In developing the courtyard elevation in this manner the architect of the Bou Inaniya Madrasa used most of the subtle and overt figures which Tzonis and Lefaivre

exemplify through the work of Andrea Palladio.<sup>18</sup> Coherence is maintained through the discontinuity by the appearance of similar elements within both motifs: stepped corbels below the trabeations and the central arch, arched windows and sunk panels following the same profile, and so on. These structural divisions of the façade are then characteristically veiled over by a layer of decoration in the Arab-Muslim tradition.

In the analysis by Georges Marçais of the Court of the Lions in the Alhambra,<sup>19</sup> what initially appears to be an arbitrary succession of single and coupled columns turns out to be an extraordinary instance of the device of overlapping one architectural part or motif over another so that the same set of elements pertains to two or more different sections — the architectural equivalent of *Takterstickung* in music (fig. 11).<sup>20</sup> It is possible to explain these complex rhythms in another

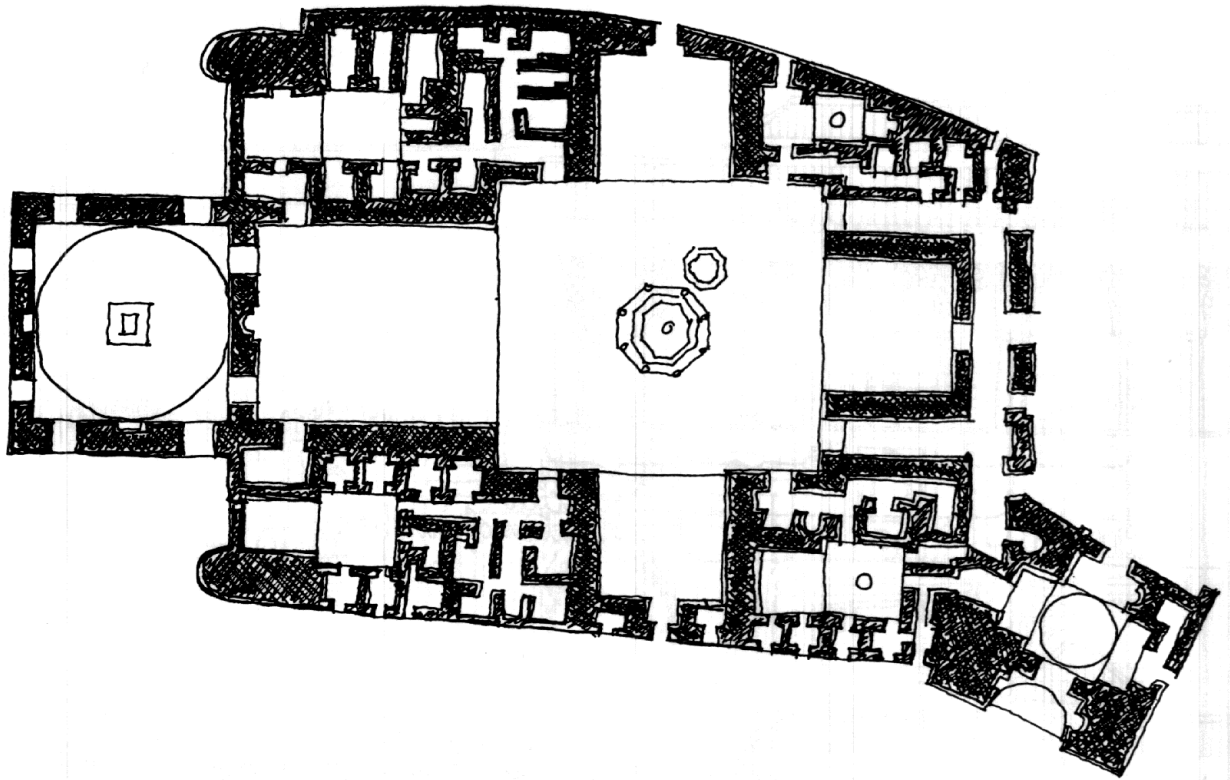


11. Overlapping motives in the Court of the Lions at the Alhambra, after Marçais (bottom); and alternative interpretation (top).

way, reading the three bays at each end of the longer façade as a reflection of the side elevations of the pavilions at each end of the courtyard. The large stretch of arcading that remains can then be seen to divide up into three parts according to the classic mosque schema: a central bay which is emphasized by its coupled columns and oversized arch and flanked on each side by five arched bays. These flanking sections are in turn subdivided into three parts by doubling the columns on

each side of their central arch. This is not to challenge the validity of Marçais's interpretation, but rather to advance an alternative reading with which it can co-exist, and so to demonstrate the Alhambra's architects' skill in weaving poetic ambiguity into the architectural discourse.

It should be clear by now that Arab architects were quite adept in the use of coupled columns, reduced or amplified intervals, changes of height or color, and the



12. The mosque-madrasa of Sultan Hasan, Cairo: plan.

modulation of decoration to mark out centers or zones of special significance. They rarely use them to mark terminations. Like the framing around geometrical interlaces and vegetal decoration, the temenos wall is likely to cut off the structuring lattices as if the latter extended beyond it to infinity, and were perpetually poised to expand and fill in the available space with their unit forms, or contract to retrench them, as soon as the boundary wall was shifted one way or the other. In defining centers and privileged zones understatement seems to be the prevailing rule, with none of the outbursts of architectural rhetoric one comes to expect from other cultures in such situations. The intention seems to be to set up gentle, barely perceptible pulsations rather than violent movement and so safeguard the feeling of equilibrium and repose. The sacred centers, as we have already noted, are accented in such a way as to require some effort in locating them, just as it requires much inner concentration to contemplate the Absolute.

The hypostyle prayer halls in which these centers are often half-concealed seem to be a perfect illustration of what Demetri Poryphyros calls "homotopia," the es-

tablishment of expansive unities through repetition and identity or similarity of component parts. When it comes to stringing together a group of spaces, however, Arab architects are more prone to take the opposite approach, "heterotopia," that "peculiar sense of order in which fragments of separate coherences glitter separately without a unifying common law."<sup>21</sup> A good example is to be found in the mosque-madrasa of Sultan Hasan in Cairo (fig. 12). Here a number of smaller coherences — a domed mausoleum, a toplighted entrance hall, four college complexes each having its own courtyard and iwan — cluster around the dominant central court, but are dissociated from each other by labyrinthine passageways calculated to obscure rather than to clarify any connection between them. Why would an architect so well versed in pulling individual spaces together refrain from linking them together into some sort of orchestrated sequence? Part of the answer may lie in the exclusivist sacrality of the temenos or haram in general and this intricate complex of teaching, living, and praying spaces and tombs in particular. Their entrances must be protected from intruders by labyrinths through which only the initiated can pick



their way. But there are even deeper implications which become clear as we reflect on certain convergencies between architecture and other media of Arab cultural expression.

In pre-Islamic poetry individual themes are rendered with brilliant imagery but remain unconnected by any logic of narrative or sentiment.<sup>22</sup> The intricately modulated themes of Arab music burst out in endless cadences without any complex polyphony or contrasting movements to bind them together into an organic unity or point them towards a climax or finale. A compulsive horror of the void, or love of the infinite, as Gombrich prefers to put it,<sup>23</sup> appears in decoration as the visual equivalent of microtonality, an urge to elaborate the particle prevailing over the articulation of the whole.<sup>24</sup> Wherever we look we encounter the celebration of life as a succession of fragmentary experiences unconnected by any threads of cause and effect. Architecture and urbanism on any scale beyond that of the single, sparkling space appear to be no exception.

#### A TRAGIC DISCOURSE

So while the urge to build an idealized world and to set it apart from an environment which is perceived as potentially hostile and uncontrollable is perhaps stronger in the Arab world than anywhere else, the compulsive concern for its security and integrity brings about the suppression of visible connections with neighboring worlds. Having secured its inviolability in this manner, its builders go on to cultivate its internal order so as to upgrade their refuge into a model environment, and having regard to the Prophet's remark that "God detests dirtiness and uproar," this ordering process becomes something of a prayer.

Within this hermetic, intensely private world much craftsmanship and visual virtuosity is expended on procuring a peculiar vibrancy that makes everything look unreal and about to change; and yet this visual excitement is subsumed into a feeling of serenity and equilibrium brought about by incantatory repetition and the suppression of violent contrasts. "Islamic architecture," notes Frithjof Schuon,<sup>25</sup> "reflects purity and calm in contemplation. The calm and balance of mosques is echoed in the murmuring of the fountains, whose undulatory monotony is repeated in the arabesques." This particular way of building a world in stone or brick, as we have seen, has its correspondences with the way Arabs construct their parallel worlds of poetry and music. The question is, to what extent are

these correspondences the product and expression of a particular view of the world?

That question has fascinated many observers of the Arab and Islamic world. Oswald Spengler's typification of Arab ("Magian") world-vision in terms of a "world-cavern"<sup>26</sup> may be too sweeping for discerning minds,<sup>27</sup> and his characterization of all mosques as caverns and the related claim that the Pantheon is "the first mosque" appear to be based on an inaccurate perception of the Dome of the Rock as a paradigm for the world's mosques. Having said that, one must concede some relevance to the image of the world-cavern which is closed in on itself, ringed by a spectral darkness but penetrated by rays of divine light, eternally caught up in the tension between up and down, heaven and earth, light and darkness, good and evil, which man can only resolve by submission to God's will. Hypostyle mosques apart, there is no denying that the Arab world is full of man-made caverns in which the thrust of the poetics we have described was to replicate the centrality, introversion, mystic light, and vertical relationship between heaven and earth that the image suggests. To this extent such spaces represent a tragic discourse that transcends the concrete purpose for which they were built. The works of man become signs (*ayat*) along with the sun, the moon and the stars, mountains, water-courses, forests and flowers, all speaking of God and His work of creation.

The "fragile grace" that Frithjof Schuon observes in mosques<sup>28</sup> comes from the manipulation of forms, colors, and materials so that everything seems to hover around and about to change its shape in the next instant. This is a key element in the tragic discourse activated by Arab architectural poetics. For one thing it ministers to the phenomenology of introverted spaces, where the desire for security and protection is compounded with that for release and adventure, so that one begins to wish that the cell was also a world, and that its walls, in the words of the poet quoted by Gaston Bachelard,<sup>29</sup> were capable of closing in like a coat of armor or floating away into the distance according to the mood of the moment; a difficult proposition that is instinctively addressed by the poetics of Arab architecture and decoration.

More importantly, it comes as close as building can to project the Muslim view that God is continuously creating and re-creating the world and that material things have thus a fugitive and ephemeral existence.<sup>30</sup> This conviction may account for the reluctance to freeze well-developed local unities into a semblance of immutability or integrate them into some grander, all-encompassing

unity. Seen in this light, the cultivated lightness and arbitrary juxtapositions of Arab-Islamic architecture, as well as the fugitive decorative patterns, fragmented poetic images, and musical improvisations converge into a tragic discourse unfolded by different media of cultural expression, each according to its own poetics.

In a similar vein the repetitive rhythms of Arab-Islamic architecture assume the cathartic properties of ritual prayer, calming the mind and directing it to introspection and communion with the Absolute. This process is supported by the convergence of forms towards an inner center, and by such devices as filtered light brought in from above. One could go on to read signs of the Absolute in the forms and devices which Arabs traditionally use to moderate a demanding climate. By separating heat from light by various filtering and shading devices they anticipate the cool light which suffuses paradise, as opposed to hell where all is heat and darkness. Houses or palaces which have a visible heart in the shape of a courtyard or a large central hall, and are capable of breathing in cool air and exhaling it as it warms up, as many Arab houses are designed to do, become eloquent symbols as well as comfortable shelters: "We inhale luminous, cool air, and our respiration is a prayer, as is the beating of our heart."<sup>31</sup> In such ways the primary and secondary functions of architecture are simultaneously addressed, and the paradise built along with the refuge.

The extraction of such meanings from the architecture of the past exerts enough fascination to become its own reward. For those who would go on to build such of them as are still felt to be relevant into the buildings of the future, the rewards may be even richer.

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#### NOTES

1. Alexander Tzonis and Liane Lefaivre, *Classical Architecture: The Poetics of Order* (Cambridge, Mass., 1986), pp. 171–74.
2. Symbolism being as much a function of an architectural work as its intended use, a distinction is made between its primary and its secondary functions, or denoted use and connoted meaning. Umberto Eco, "Function and Sign: The Semiotics of Architecture," in *Sign, Symbol and Architecture*, ed. G. Broadbent et al. (Chichester, 1982), p. 25.
3. Ibn Khaldun, *The Muqaddimah*, trans. J. Rosenthal (Princeton, N.J., 1958), vol. 2, pp. 319, 357.
4. Al-Walid resolved to neutralize the seductive effect of Syria's

splendid Christian churches on Muslims by building them a mosque that would outshine them and be "unique and a wonder to all the world." Al-Muqaddasi, as quoted in K.A.C. Creswell, *Early Muslim Architecture* (New York, 1979), vol. 1, p. 151.

5. Henri Stierlin, *Architecture de l'Islam* (Fribourg, 1979), pp. 42–43.
6. The mud-brick or concrete-block houses built by newly sedentarized Bedouins in the Wadi Fatima are typologically similar to the original house/mosque of the Prophet at Medina. M. Katakura, *Bedouin Villages: A Study of a Saudi Arabian People in Transition* (Tokyo, 1977), p. 74.
7. In dissecting formal structures, I shall be drawing on the terminology used by Wucius Wong in *Principles of Two-Dimensional Design* (New York, 1972), and *Principles of Three-Dimensional Design* (New York, 1977), as this is applicable to a wider range of genres and cultural traditions than that used by Tzonis and Lefaivre.
8. Ronald Lewcock, "Materials and Techniques," in *Architecture of the Islamic World: Its History and Social Meaning*, ed. George Michell (New York, 1978), pp. 129–133; Renata Holod, "Text, Plan and Building: On the Transmission of Architectural Knowledge," and Yasser Tabbaa, "Geometry and Memory in the Design of the Madrasat al-Firdows in Aleppo," in *Theories and Principles of Design in the Architecture of Islamic Societies* (proceedings of a conference held at MIT in 1987), (Cambridge, Mass., 1988), pp. 1–12; 23–34.
9. A repetition structure regulates the placing of unit forms by dividing a space into equal or rhythmical subdivisions. Wong, *Principles of Two-Dimensional Design*, pp. 23–25.
10. Alexandre Lézine, *Architecture de l'Ifrigiya* (Paris, 1966), p. 56, citing Jean Sauvaget, *Mosquée Omeyyade de Médine*, pp. 81–82.
11. Georges Marçais, *L'Architecture musulmane d'Occident* (Paris, 1954), pp. 72–73; Lézine, *Architecture de l'Ifrigiya*, pp. 116–22.
12. Wong, *Principles of Two-Dimensional Design*, pp. 49–55.
13. Bernard Huet, "The Modernity of a Tradition: The Arab-Muslim Culture of North Africa," *Mimar* 10 (1983): 54.
14. A peculiarity of traditional mosque architecture ironically invoked by Robert Venturi in his design for the State Mosque at Baghdad, in which the forest of columns is swept away and the decorated arches left hanging in mid-air, resolving an absurd programmatic requirement to reconcile state-of-the-art technology with ancient architectural traditions.
15. In the Alhambra, there are inscriptions describing it as "a bride in nuptial attire," and the poet Ibn Zamraq effusively compares the decoration which "clothes" it to brocades from the Yemen; Oleg Grabar, *The Alhambra* (Cambridge, Mass., 1978), pp. 143–46. For an exhaustive exposition of the textile analogy in Islamic architecture, see Lisa Golombek, "The Function of Decoration in Islamic Architecture," in *Theories and Principles of Design* (cited above, n. 8), pp. 35–46.
16. A serial plane is a cross-section of a volumetric form; used as a unit form and repeated regularly, it releases a perceptual mechanism which virtually reconstructs the generating volume by filling in its missing sections (Wong, *Principle of Three-Dimensional Design*, pp. 15–17).
17. Tzonis and Lefaivre, *Classical Architecture*, p. 128.
18. *Ibid.*, pp. 157–60. Analyzing Palladio's church facades, Tzonis applies terms borrowed from classical music and rhetoric to the architectural figures we encounter in the Bou Inaniya Madrasa, *aposiopesis*, or the interruption of a series; *abruptio*, the breaking off of an element in a series, and *epistrophe*, the return to the initial series.

19. Marçais, *L'architecture musulmane*, pp. 347-48.
20. Tzonis and Lefaivre, *Classical Architecture*, p. 163.
21. Demetri Porphyrios, *Sources of Modern Eclecticism* (London, 1982), pp. 1-4.
22. Jacques Berque, *Cultural Expression in Arab Society Today*, trans. R. W. Stookey (Austin, Tex., 1978), pp. 157-59. However Kamal Abu Deeb, in a brilliant analysis of pre-Islamic poetry, takes issue with the application of Western notions of "organic unity" to this genre; "Towards a Structural Analysis of Pre-Islamic Poetry," *International Journal of Middle East Studies* 6,2 (April 1975): 148-84.
23. E. H. Gombrich, *The Sense of Order: A Study in the Psychology of Decorative Art* (Oxford: Phaidon Press, 1984), pp. 80-81.
24. Grabar, *Alhambra*, pp. 198-99.
25. Frithjof Schuon, *Understanding Islam*, trans. D. M. Matheson (London, 1965), p. 137.
26. Oswald Spengler, *The Decline of the West*, vol. 2: *Perspectives of World History*, trans. C. F. Atkinson (New York, 1966), pp. 233-38.
27. Edward W. Said dismisses Spengler out of hand in *Orientalism* (New York, 1978), p. 208, but Hichem Djait is more sympathetic in *Europe and Islam* (Berkeley: University of California Press, 1985), pp. 87-93.
28. Schuon, *Understanding Islam*, p. 137.
29. Gaston Bachelard, *The Poetics of Space*, trans. M. Jolas (New York, 1964), p. 51. The poet quoted is Georges Spyridaki, *Morte lucide*, p. 35.
30. Alexandre Papadopoulo, *Islam and Muslim Art*, trans. R. E. Wolf (New York, 1979), pp. 178-79.
31. Schuon, *Understanding Islam*, p. 57.