

THE MOSQUE OF TINMAL (MOROCCO)
AND SOME NEW ASPECTS OF ISLAMIC
ARCHITECTURAL TYPOLOGY¹

By CHRISTIAN EWERT

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THE mosque of Tinmal² (Figs. 1-7, 8c, Pls. VI-XI, XIII, XIV) may be regarded as one of the classic sanctuaries of western Islam. It was commissioned in 1153/4³ as a memorial to the founder of the Almohad movement, at the place where he had worked and died, some 100 km south of Marrakesh,⁴ which had become the new centre of Andalusian Islamic art. We may take it that a picked élite of craftsmen was sent from the capital to the Atlas. The mosque of Tinmal is now a ruin, standing above the orchards of the valley of the Wādī Nfis at the foot of steeply rising mountains. Its layout is closely related to the dual ground plan of the Kutubiyya Mosque in Marrakesh (Fig. 2),⁵ but reduced in size by a half—with nine instead of seventeen aisles. It represents the sublimation and clarification of a number of characteristics of this school of architecture: a school which brought together the

¹ English translation of the German text by Katherine Watson. The ideas propounded in this paper are based on the results of the series of investigations 'Forschungen zur almohadischen Moschee' (Research on the Almohad mosque) carried out in several parts since 1975 with the support of the Moroccan Service de l'Archéologie, the Deutsches Archäologisches Institut, and the Deutsche Forschungsgemeinschaft. So far in collaboration with J.-P. Wisshak I have published the following monographs arising from the work: I, *Vorstufen: Hierarchische Gliederungen westislamischer Betsäle des 8. bis 11. Jahrhunderts: Die Hauptmoscheen von Qairawān und Córdoba und ihr Bannkreis* (Mainz, 1981) (henceforth Ew-Wi 1981); II, *Die Moschee von Tinmal (Marokko)* (Mainz, 1984) (henceforth Ew-Wi 1984). Further abbreviation used in these notes: Creswell, *EMA* = K. A. C. Creswell, *Early Muslim Architecture* (i², Oxford, 1969; ii, Oxford, 1940).

² Detailed bibliography: Ew-Wi 1984, n. 4.

³ For the dating inferred from the sources cf. H. Basset and H. Terrasse, *Sanctuaires et forteresses almohades* (Paris, 1932), p. 27 and n. 2.

⁴ For the topographical situation of the Tinmal mosque cf. Basset and Terrasse, *ibid.*, fig. 1, and Ew-Wi 1984, fig. 1.

⁵ Cf. especially Ew-Wi 1981, pp. 1-7.

basic features of the traditional western type of mosque architecture and made a valid formulation for the future.

The ground plan of the mosque of Tinmal (Fig. 1) is an example of the T-type already adumbrated in eastern Umayyad architecture—especially in the al-Aqṣā Mosque in Jerusalem¹—and prefigured with astonishing clarity in the pre-Almohad West in the Aghlabid reconstruction of the Great Mosque of Qairawān (Fig. 14),² that is to say, before the middle of the ninth century.³ The central nave, appreciably wider than the side aisles, and a transept in front of the qibla form the T; the side aisles stop at the transept. The central nave and transept interpenetrate; a domed bay rises in front of the miḥrāb. In al-Ḥakam II's extension to the Great Mosque of Córdoba, added in the second half of the tenth century, the number of domes over the transept is increased. This triple group is, however, still focused on the central area of the maṣṣūra.⁴ In the first two monumental sanctuaries of the Fāṭimids in Cairo, the al-Azhar and al-Ḥākim mosques⁵ built at the turn of the tenth to eleventh century, the flanking domes were placed as far laterally as possible, that is to say, at the corners of the building, as was later to become characteristic of Almohad mosque design, and as they are in Tinmal (Figs. 1, 3–5). In the amplified Almohad type of the Kutubiyya (Fig. 2) there are two additional intermediary domes.

In Tinmal the whole qibla transept is extended into a three-sided ambulatory embracing the oratory (Figs. 1, 8c): the outer aisles repeat exactly the width of the transept. In elevation lambrequin arches stress the unity of this three-armed gallery: apart from a blind projection at the start of the central nave (Pl. X, right) they are reserved exclusively for this walk (Fig. 6: central and extreme bays; Pls. IX, left, X, left, XI, cf. also XII).⁶ There are strong indications that the original plan included a north riwāq: our excavation showed⁷ the typical angular profiles for corner piers. This second three-armed motif, which includes the

¹ Ground plan: Creswell, *EMA*², i, 2, overlay to fig. 446.

² Ground plan: Creswell, *EMA*, ii, fig. 180.

³ For the preliminary stages cf. Ew-Wi 1981, ch. 1, pp. 8–29.

⁴ Ground plan: Ew-Wi 1981, fig. 34.

⁵ Ground plans: K. A. C. Creswell, *The Muslim Architecture of Egypt*, i (Oxford, 1952), figs. 21, 32.

⁶ For the distribution of the arches cf. also Fig. 1. In the Kutubiyya the concept of the three-sided ambulatory is markedly weaker. Only these elevation elements illustrate it. In contrast with Tinmal the outer aisles are no wider than the rest.

⁷ J. Hassar-Benslimane, C. Ewert, A. Touri, and J.-P. Wisshak, 'Tinmal

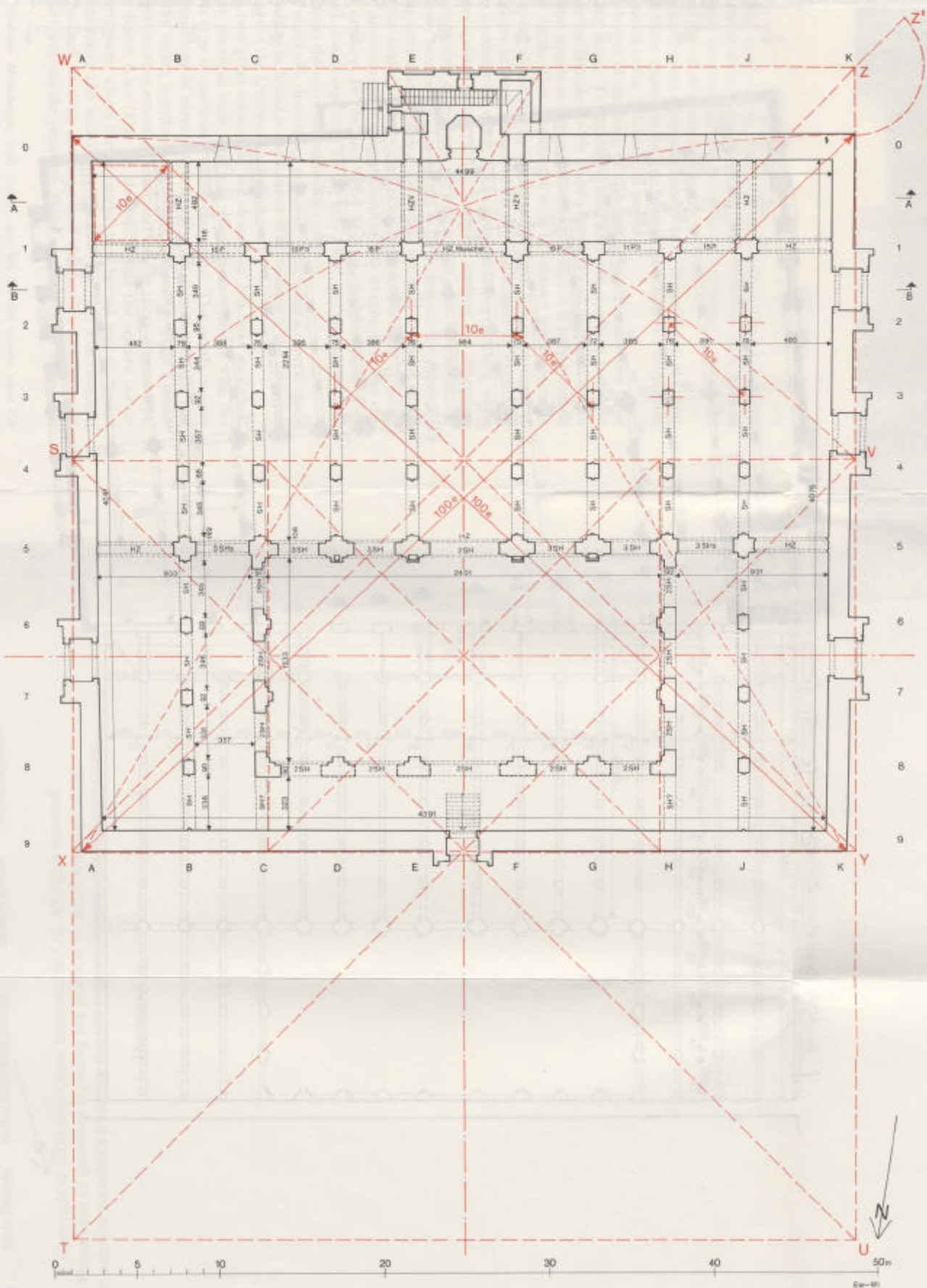
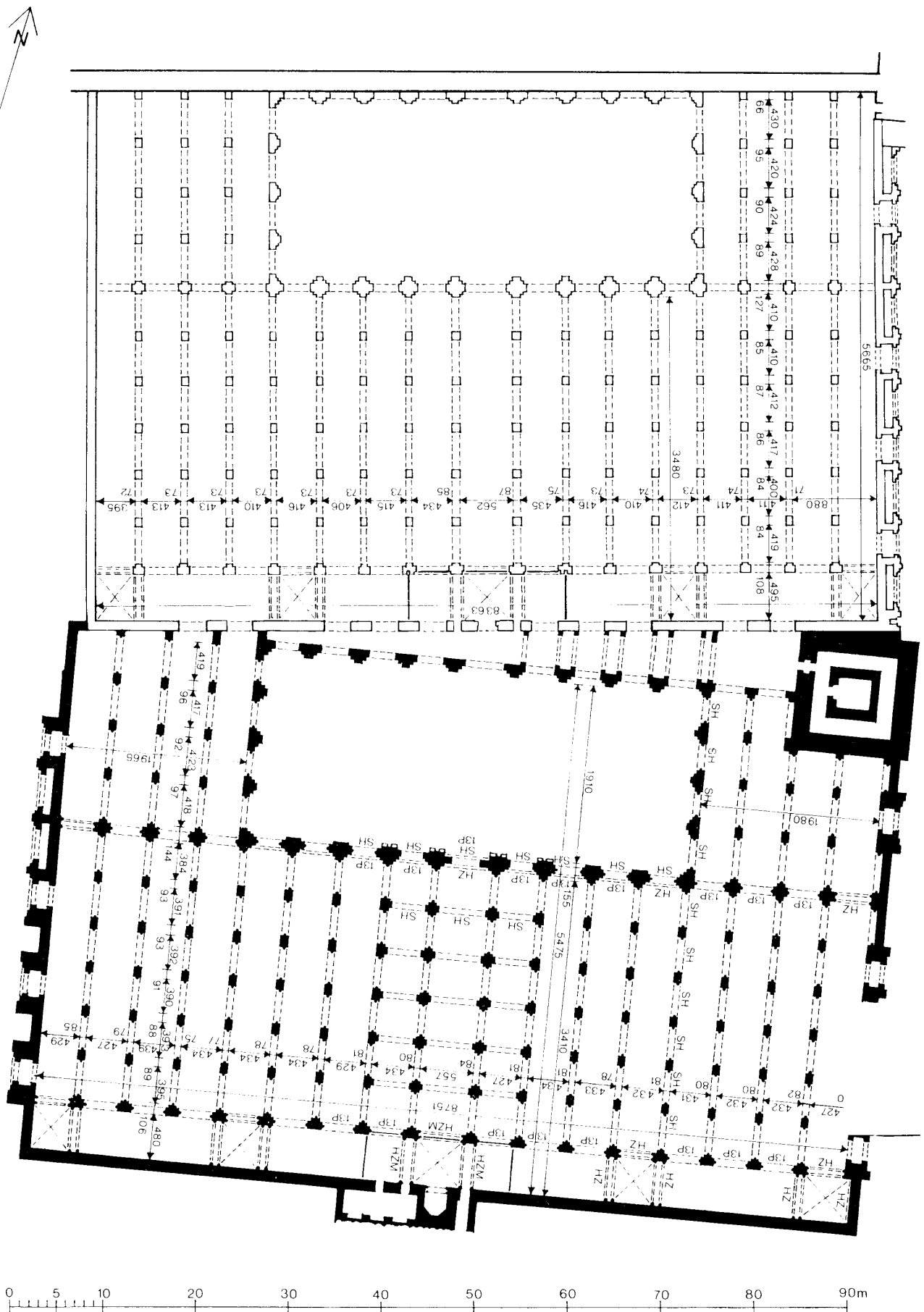







Fig. 1. Mosque at Timna, reconstructed ground plan (completed project of the north risad pier hatched) with geometric scheme, 1:250. For the distribution of the arcade arches: SH = pointed horseshoe arch with single striped soffit; gSH = pointed horseshoe arch with 2 or 3 stripes on soffit (with wider and higher framing arches of the same shape as the main soffit); gSHs = special form of SH; the central zone of the soffit is recessed as in types P and HZ; 13P = 13-lobed arch (with 3-striped soffit); 11P = 11-lobed arch with three-lobed broken lobes (and 3-striped soffit); HZ = 3-lobed arch; HZV = framing arches (the central broad soffit zone as a rule correspondingly broken); HZM = framing arches as HZ, central soffit zone with plant decoration; net of leaf arches (vertex zone in mugs); HZ Muschel = framing arch as HZ, a shell at each foot of the broad soffit zone.




presumed north riwāq, surrounds the court on three sides. The large and small -shapes overlap in two aisles on each flank of the court, interlocking and creating an ambulatory round the edges of the whole mosque (Fig. 8c).

The motif of the three-sided ambulatory is traditional in Islam; related forms appear in the pre-Islamic Near East. Its origins are to be traced to the Achaemenid period.¹

The layout of the castle of Ukhaidir (Fig. 8a) comprises three screening zones. The building itself with the dwelling and state apartments, complete with its own towered wall, is placed within an almost square outer ring of walls to which it is only attached on the north. This produces a wide -shaped surround, only interrupted on the east by an interior annexe; it is reminiscent of the ziyādas of large mosques.² In the castle itself an encircling gallery separates the whole dīwān from the living quarters, while an inner gallery, once more -shaped, stresses the innermost 'core', consisting of the audience hall and its iwān. The dominant transverse arm of this -shaped walk is formed by a portico opening onto a secondary court, while suites of doors on either side of the dual core create the flanks. This motif of early 'Abbāsid palace architecture is still retained in the Maghreb in the sixteenth century. In the Ben Yūsuf Madrasa in Marrakesh (Fig. 8b) the -walk separates off the holy 'core', the mosque with its court, from the surrounding living quarters.

The motif of a three-sided enclosure protecting a central space is already to be found in the Islamic West in some of the principal buildings of the Umayyad caliphate.

The two great saloons so far cleared at Madīnat az-Zahrā' have an identical basic structure which is comparable with the western type of sanctuary under discussion. The nearly square core, consisting of three longitudinal aisles with the central one markedly wider, is entirely flanked by side rooms, while a transverse portico runs across the front; this has the effect of a transept. In the Salón Rico (Fig. 8e) the position of the square corner compartments, where the 'transept' and lateral legs of the  interpenetrate, also anticipates Tinmal (Fig. 8c). The contrast, between dark flanking chambers and the portico opening onto the court, repeats the principle of the early 'Abbāsid solution of

1981', *Madridrer Mitteilungen*, xxiii (1982), 440-66; for the corner piers C8 and H8 see especially trenches 1 and 2: p. 452f., figs. 12-15, pl. 80.

¹ Cf. Ew-Wi 1984, n. 49.

² Cf. Ew-Wi 1984, p. 14.

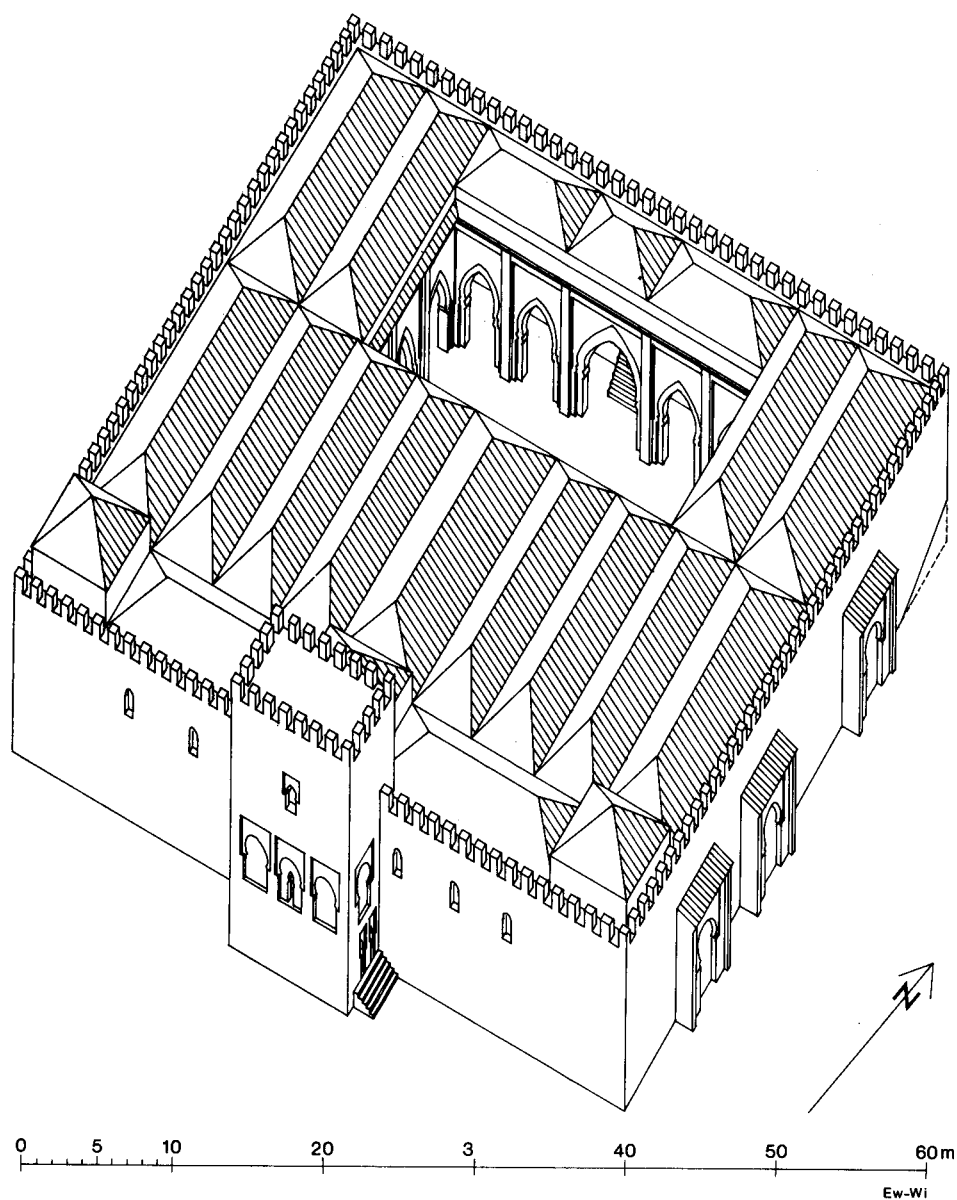


FIG. 3. Mosque at Tinmal, reconstruction; axonometry with completed project of north riwāq from south-east, 1:500 (Ew-Wi 1984, fig. 4).

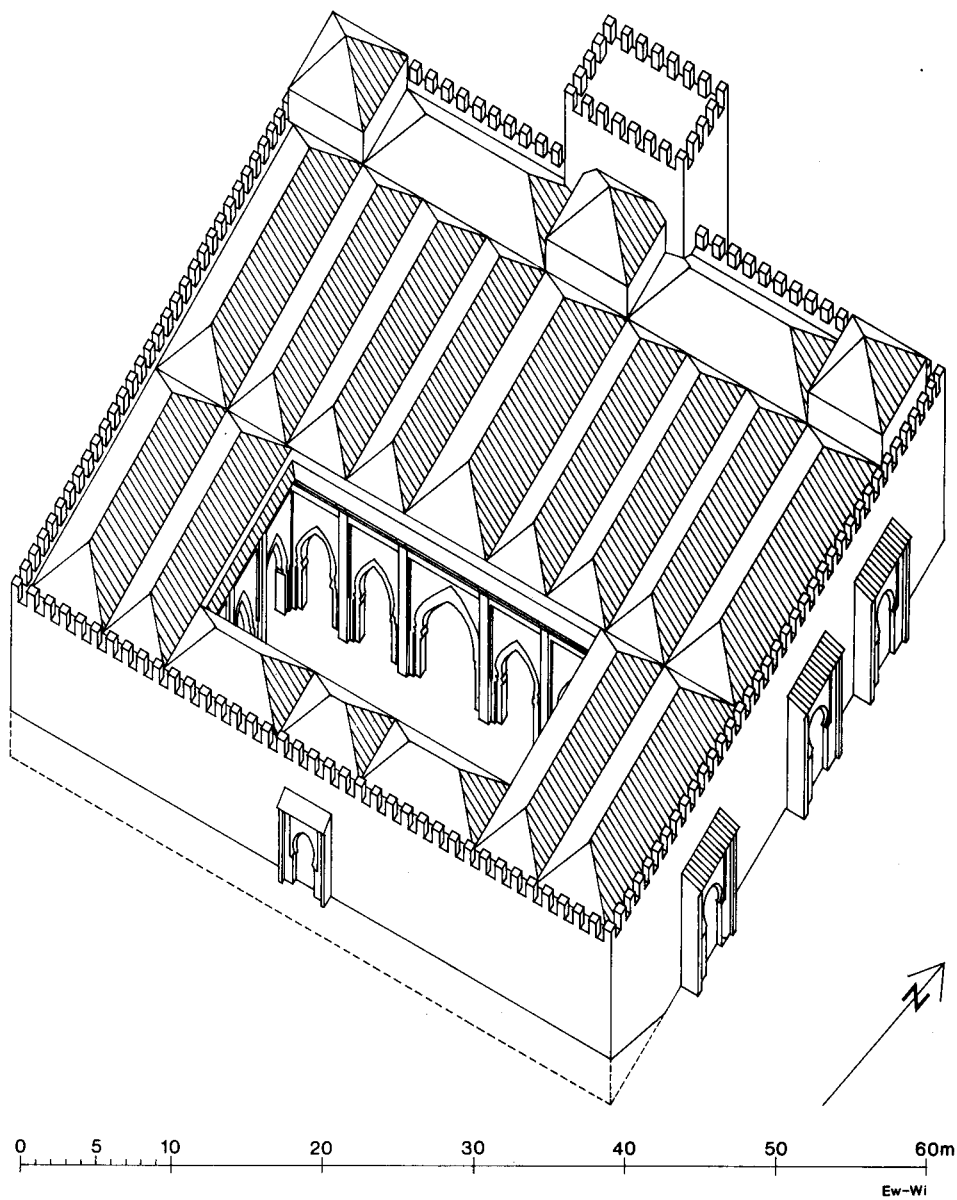





FIG. 4. Mosque at Tinmal, reconstruction; axonometry with completed project of north riwāq from north-west, 1:500 (Ew-Wi 1984, fig. 5).

the inner -shaped gallery at Ukhaiḍir, and again, even more telling, the way the individual compartments of this 'ambulatory', still entirely conceived as a suite of rooms, are shut off from each other, connected only by a single door each. But there is an important difference: the core of the Salón Rico opens wide onto the portico, to the transept-like main element of the ambulatory. In the earlier 'Plain Hall' (Fig. 8*d*) this trend had already been thought through to its conclusion. The free-standing columns are missing in the openings, and, as in a mosque of nave and transept type, each longitudinal aisle has only one transverse arch. In the final recension of the Salón Rico the connection between three-aisled core and flanking ante-chambers was further reduced. Two side-openings on each flanking wall of the main hall were changed into niches and only one door in the centre was retained, so that the smaller square cells on the north side can only be entered from the cells on the south, which, in their turn, open directly onto the core. The arms of the -shaped ambulatory are thus more strongly set apart from the core, and stand out as a functional unit. In the 'Plain Hall' (Fig. 8*d*) the flanking rooms are not divided and appear as genuine outer aisles. They each open in three wide arches onto the aisled core, in the same way as does the core onto the portico, whose two corner compartments were originally kept apart from the -ambulatory.¹ The ambulatory and core fuse together in a diaphanous solution strongly presaging Tinmal.

These few examples of a persistent scheme in the ground plan are enough to demonstrate the extraordinary variety of its application, independent of the function of the building: mosque (Tinmal); palace (Ukhaiḍir and Madīnat az-Zahrā'); madrasa (Marrakesh). But even within the same complex it should not be assumed that there is a similarity of function and requirement, even though the same basic scheme appears in similar variants, all conceived in organic dependence of each other: at Madīnat az-Zahrā' both the Salón Rico and the 'Plain Hall' were first thought to be the ruler's reception halls, but the 'Plain Hall' does not meet the requirements of such a function, and the sources suggest much more forcibly that it should be identified as the 'dār al-ğund', a kind of guard room.

It is difficult to justify even the claim of an identical basic function for the surrounding ambulatory in all the buildings so

¹ The central compartment of the transept-like portico was thus of the same width as the whole five-aisled hall block.

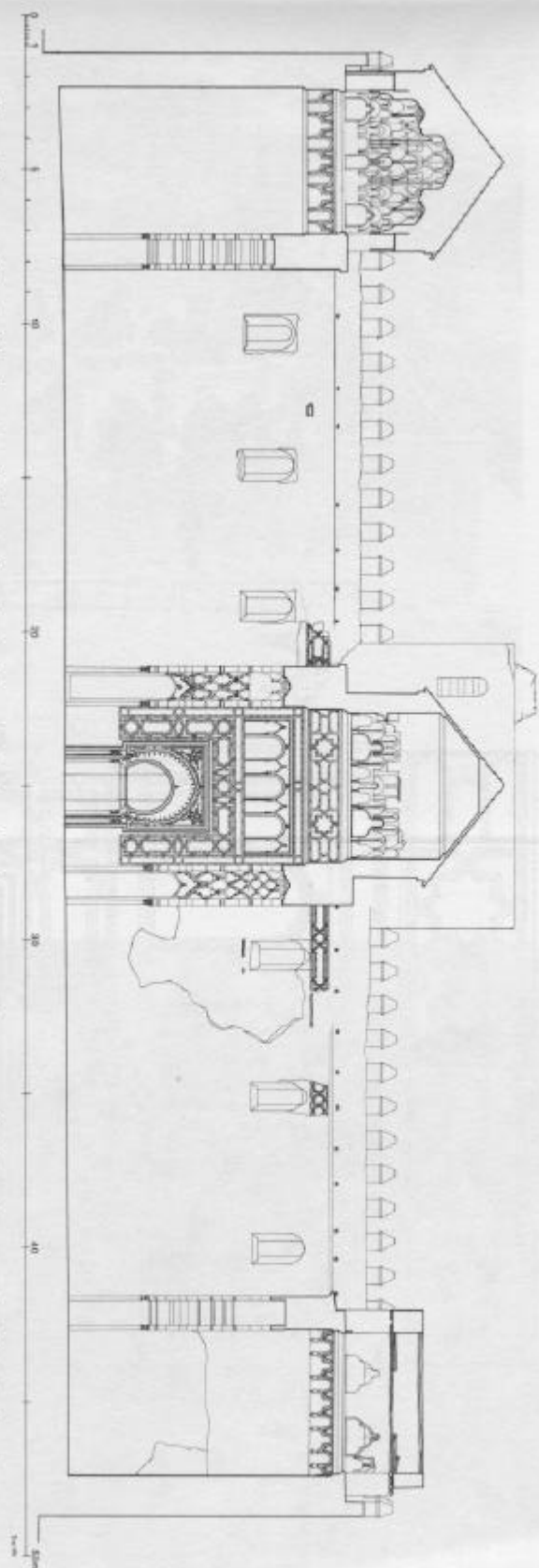


Fig. 5. Mosque at Timmal, qibla, inner (north) front and section A-A through the three domed compartments (in centre, mihrab facade), 1:200 (Ew-Wi 1984, plan 5).

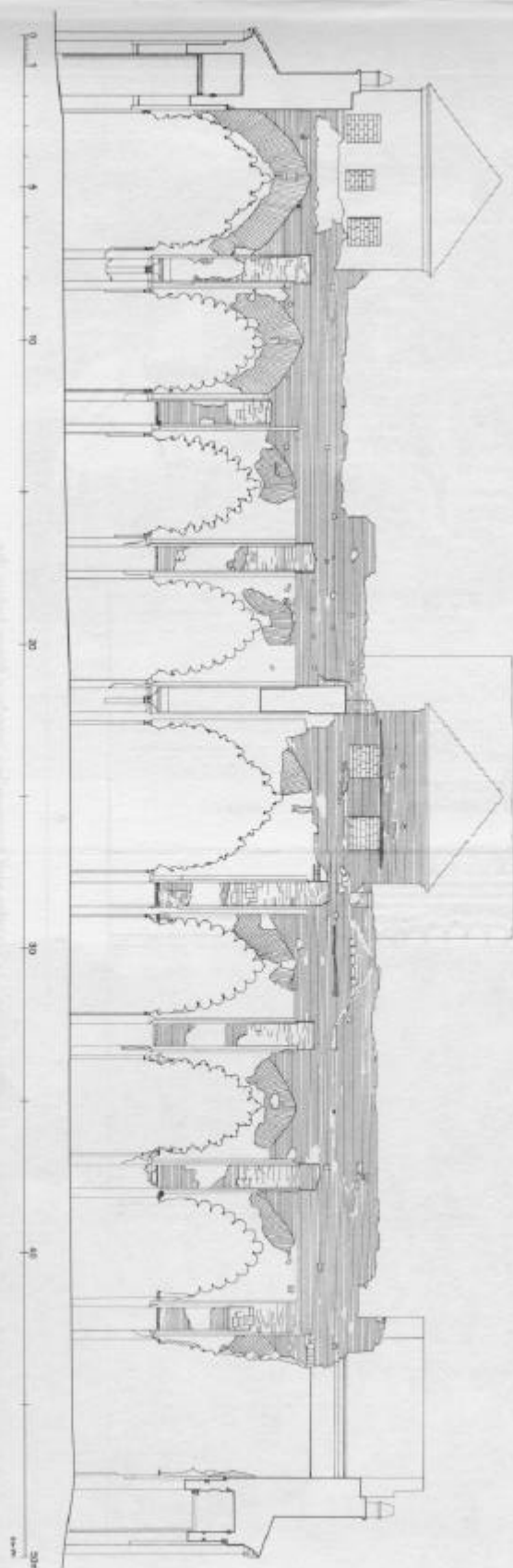


Fig. 6. Mosque at Timmal, transverse arcade fronting qibla (A1-K1), north front and section B-B through the two southern side gates, 1:200 (Ew-Wi 1984, plan 10).

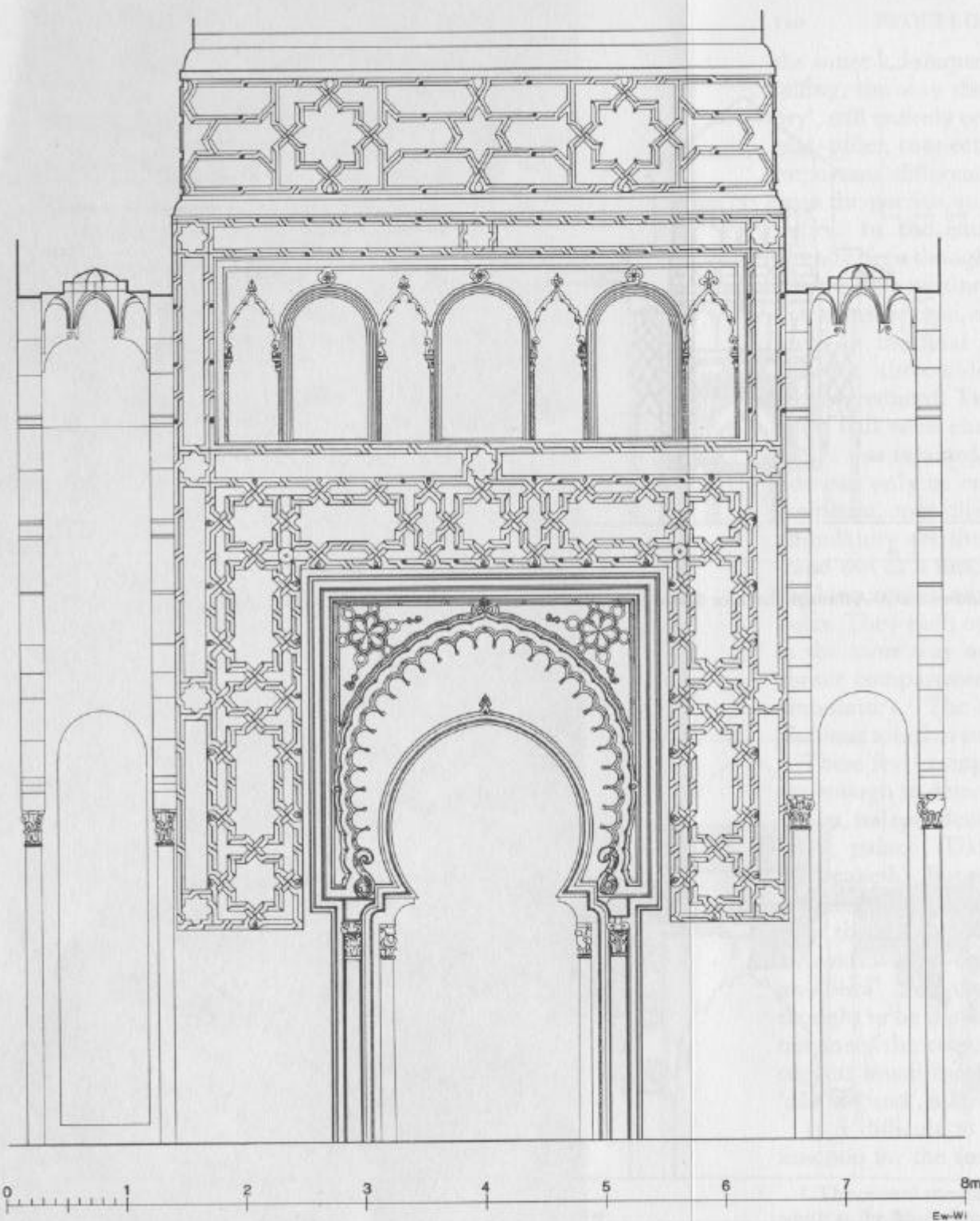
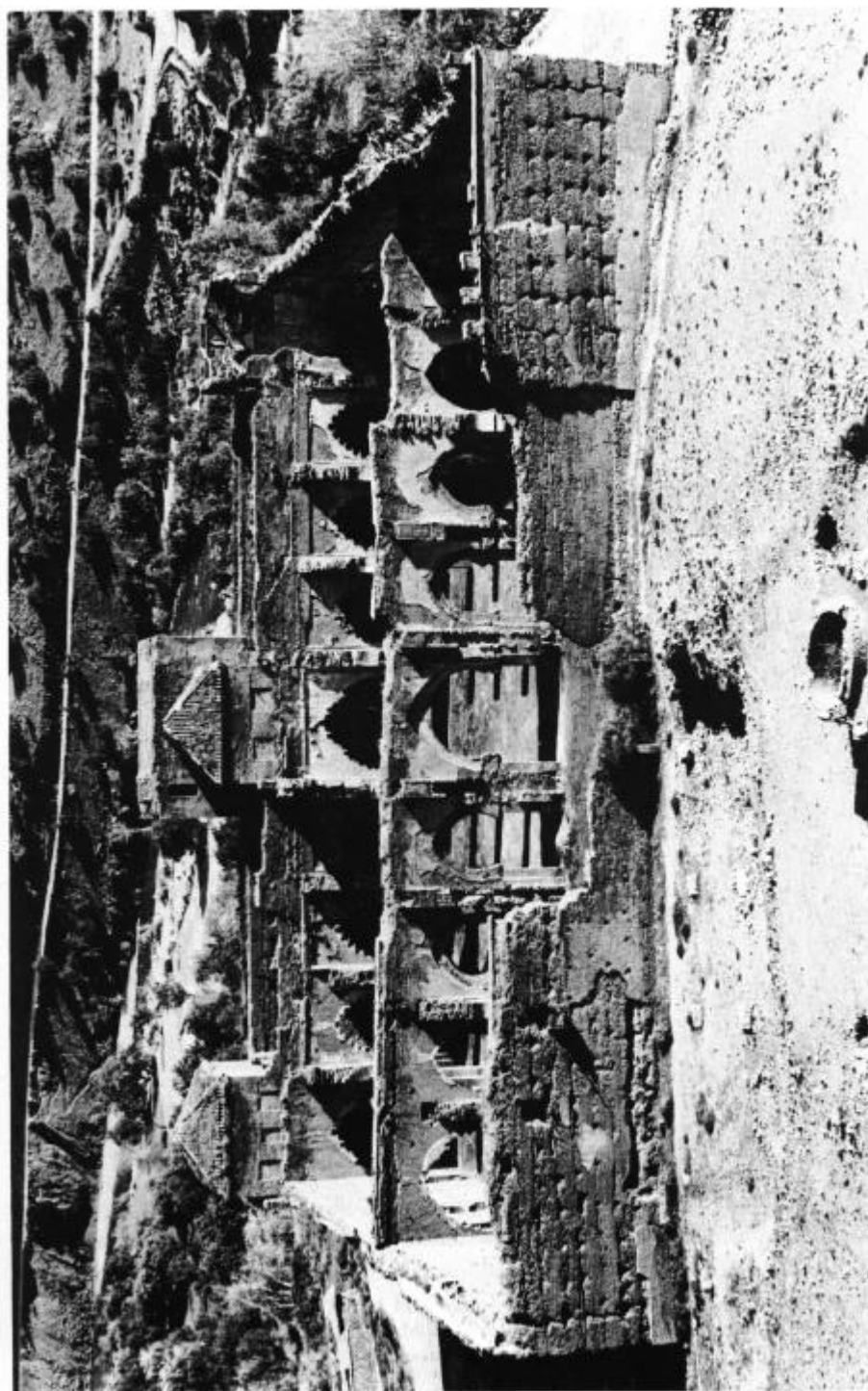


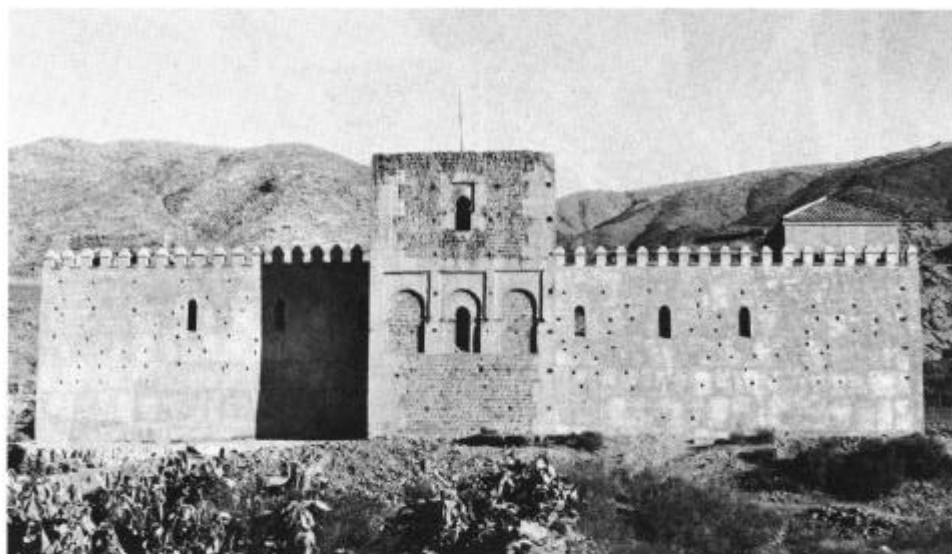
FIG. 7. Mosque at Tinmal, mihrāb façade with vertical section of flanking arcades and surrounding interlace frieze below the dome fronting the mihrāb (net decoration on central soffit of flanking arches not shown, owing to foreshortening of curve), 1:50 (Ew-Wi 1984, plan 7).

[Facing p. 121]



Mosque at Tinnal from north (1968, before full restoration of surrounding wall) (Photo: C. Ewert).

PLATE VII

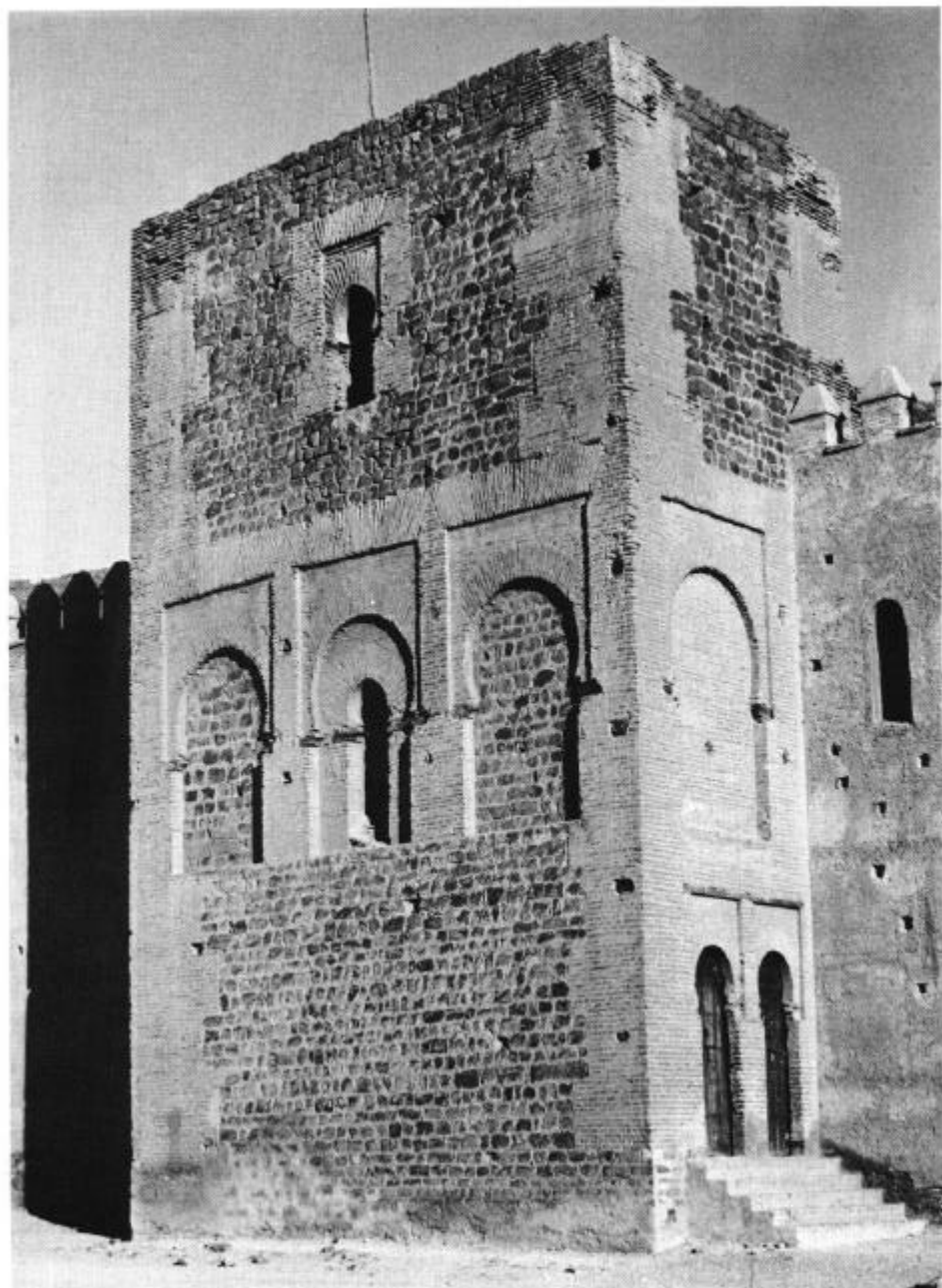


a

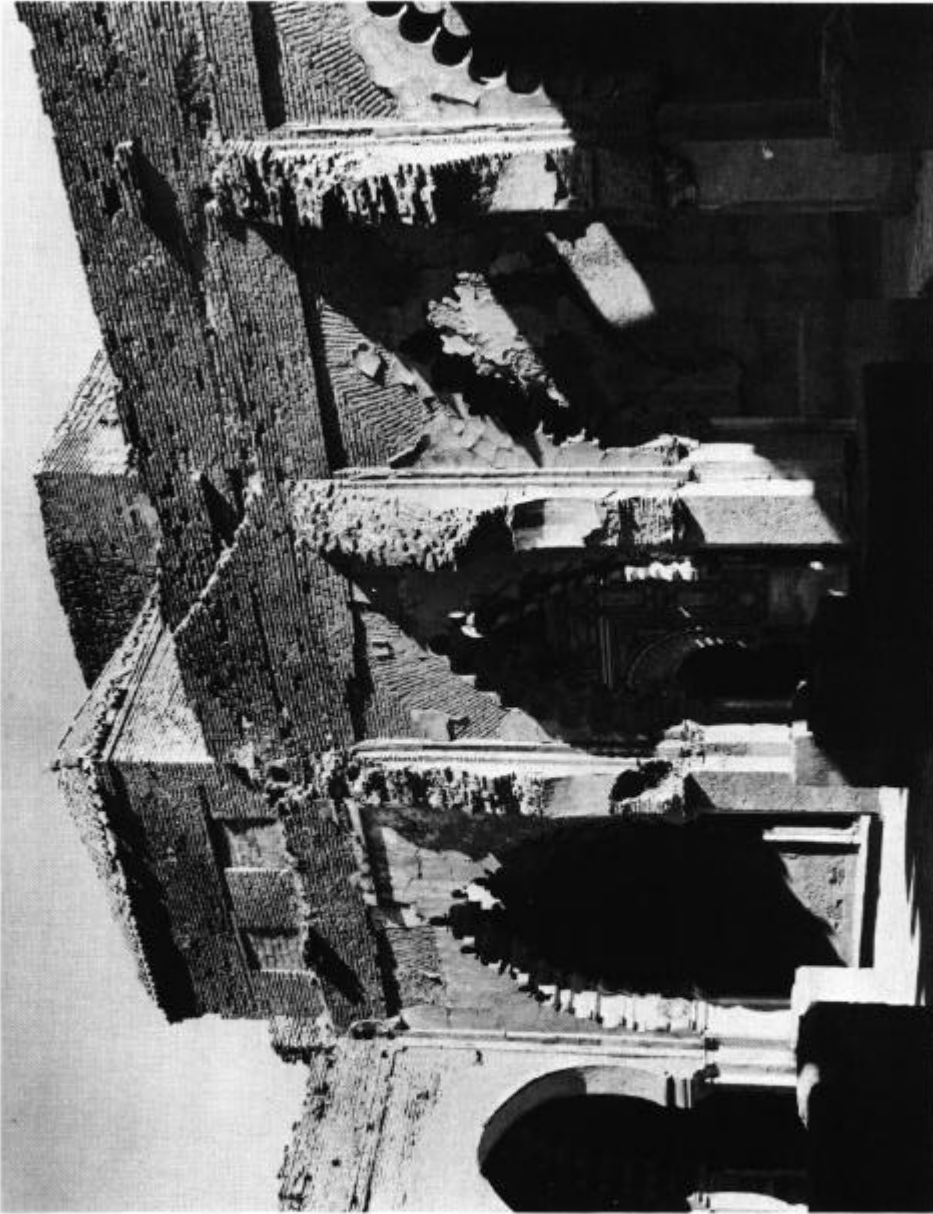


b

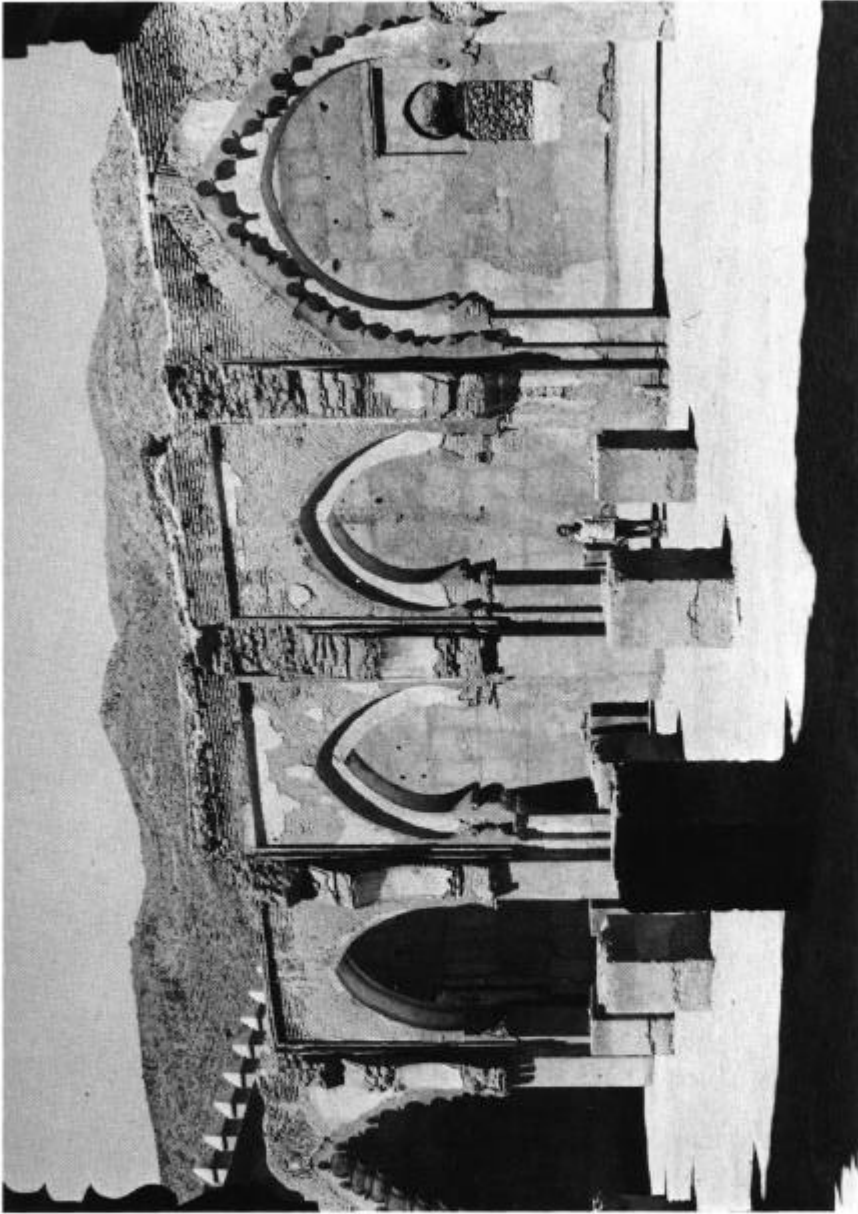
Mosque at Tinmal. *a*, from south (1975); *b*, qibla and minaret from east-south-east (before full restoration of surrounding wall) (*a*, photo: DAI Madrid, J.-P. Wisshak; *b*, photo: Service d'Archéologie Marocaine).



Mosque at Tinmal, minaret from south-east (1975) (Photo: DAI Madrid, J.-P. Wisshak).



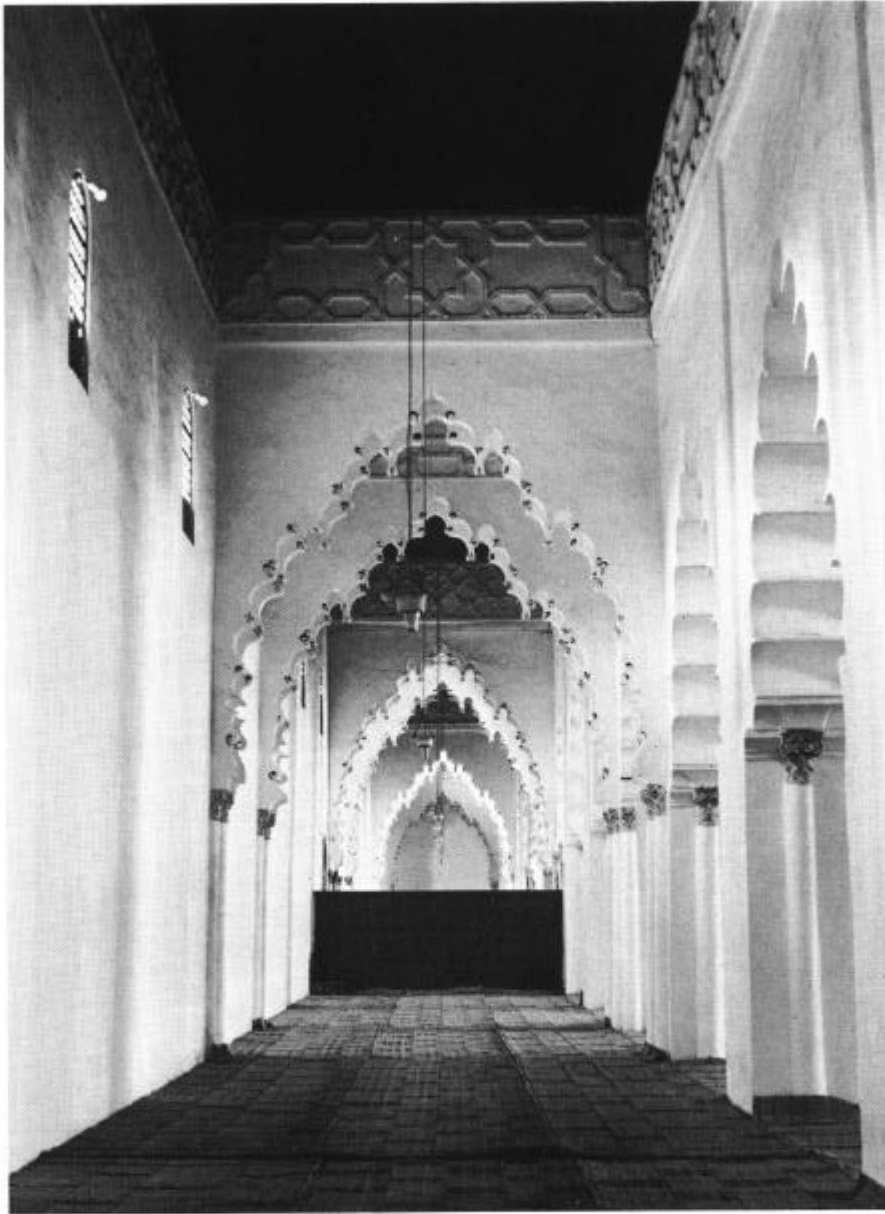
Mosque at Tinnal, transverse arcade in front of qibla from north-west (from D₁ to H₁; on left, southern bay of eastern central nave arcade E₁-E₂; 1975) (Photo: DAI Madrid, J.-P. Wissak).



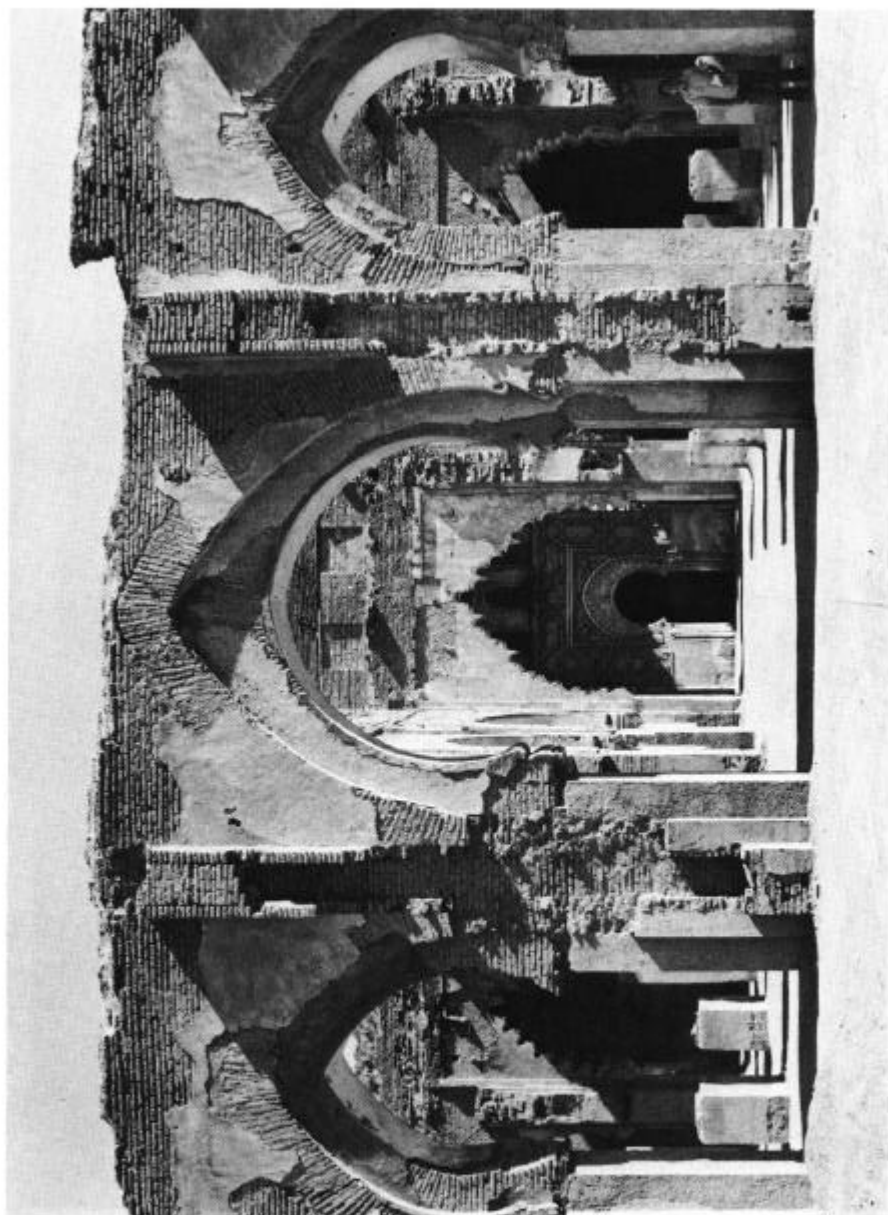
Mosque at Tinmal, transverse arcade on north boundary of qibla riwāq from south-south-east (from E₅ to K₅, background right, gate in north wall; 1975) (Photo: DAI Madrid, J.-P. Wissak).



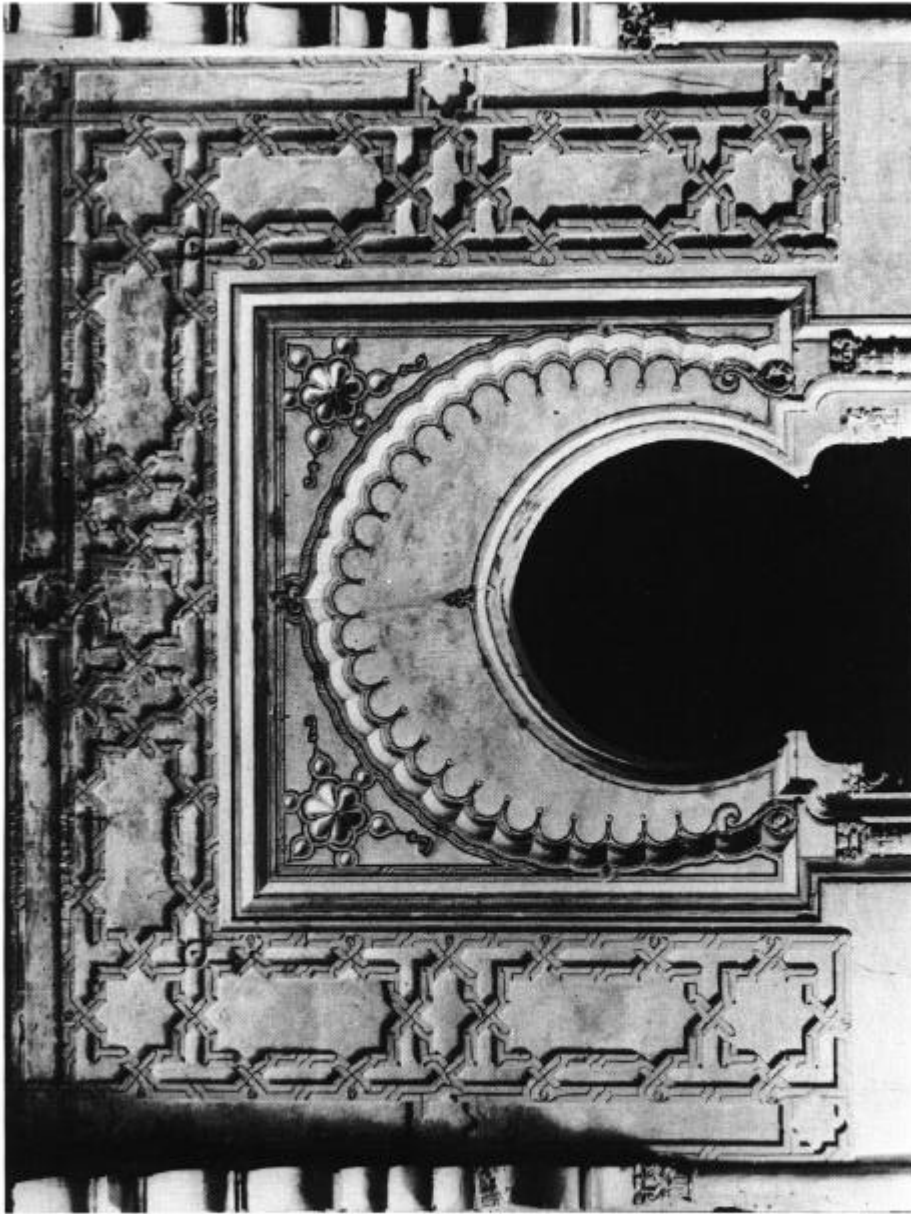
Mosque at Tinmal, transept in front of qibla from west (on left, transverse arcade fronting qibla; 1975) (Photo: DAI Madrid, J.-P. Wisshak).



Second Kutubiyya Mosque at Marrakesh, transept in front of qibla from east (Photo: DAI Madrid, J.-P. Wisshak).



Mosque at Tinmal, view from court through nave to mihrāb (in foreground, central bay of transverse arcade on north boundary of qibla riwāq; 1975) (Photo: DAI Madrid, J.-P. Wissiak).



Mosque at Tinnal, mihrāb façade, entrance arch; central field; double interlace alfiz (night photograph, 1975) (Photo: DAI Madrid, J.-P. Wissihak).



La Zisa, Palermo, from south (1967) (Photo: C. Ewert).



Qasba Mosque at Marrakesh, view from minaret (in centre, main court; right, qibla riwāq; 1968) (Photo: C. Ewert).

PLATE XVII



a



b

Qasba Mosque at Marrakesh, main court (1977) *a*, view from south-east (north riwāq on right); *b*, view onto qibla riwāq (Photos: DAI Madrid, J.-P. Wisshak).

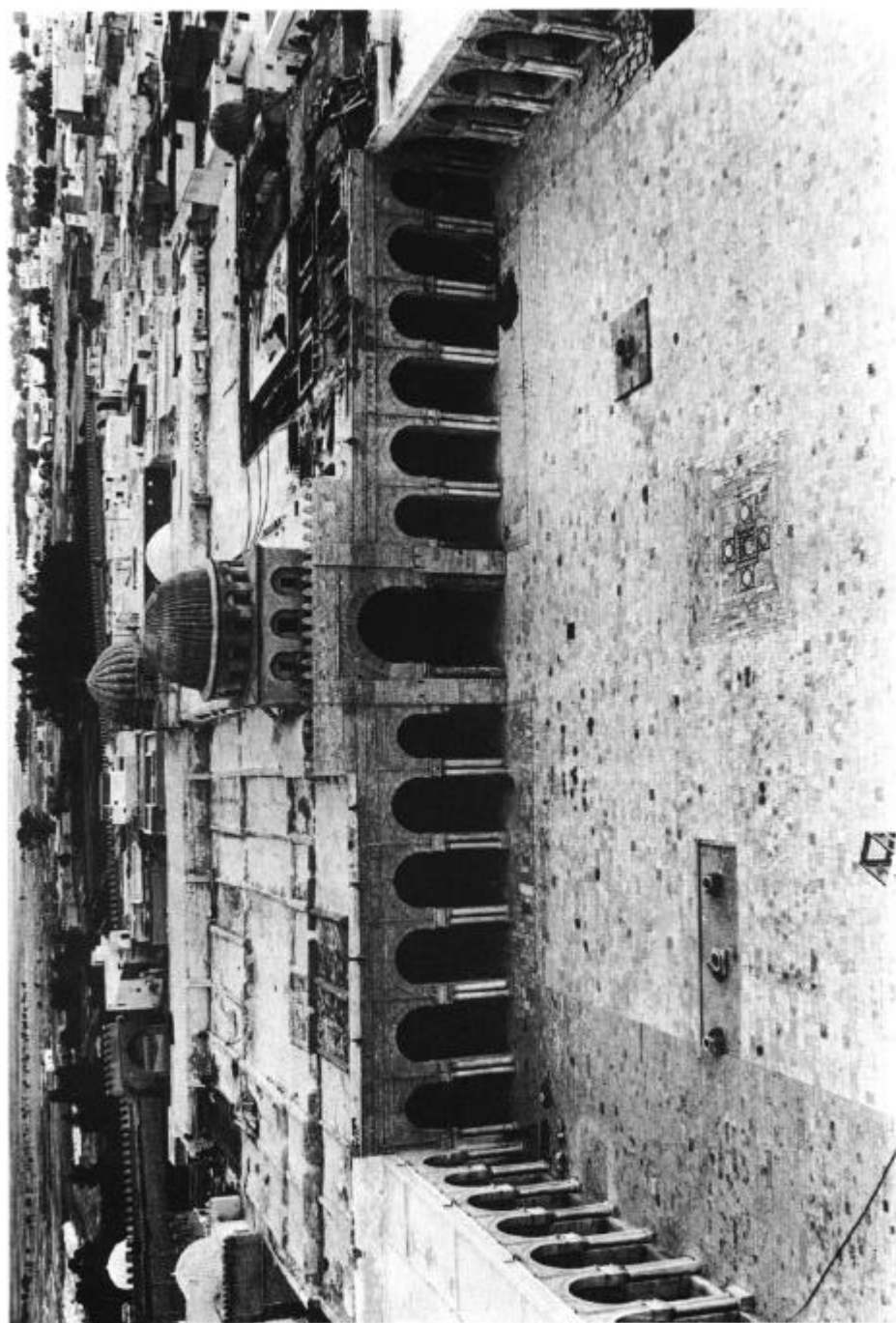


a



b

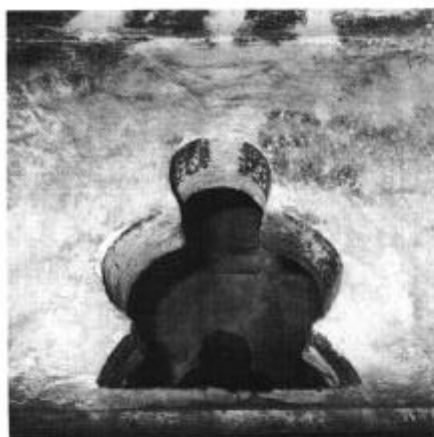
Qashbah Mosque at Marrakesh, side courts (1978). *a*, view from south-east court through main court to north-west court; *b*, view from south-west court through transverse aisle of west wing to north-west court (Photos: DAI Madrid, J.-P. Wisshak).



Great Mosque at Qairawān, view from minaret onto qibla riwāq (1958; during restoration works) (Photo: C. Ewert).



Great Mosque at Qairawān, view of oratory from innermost eastern aisle to west (1977) (Photo: DAI Madrid, J.-P. Wissiak).



a



b



c



d



e

Mosque at Bāb al-Mardūm, Toledo, intermediary storey. *a-d*, arches in walls separating compartments (1976). *a*, between compartments 7-8; *b*, 3-6, *c*, 5-4, *d*, 5-6; *e*, blind arcade



3



6



9



2



5



8



1




4



7

Mosque at Bâb al-Mardûm, Toledo, vaults (1976; numeration as in plan, fig. 20)
(Photos: DAI Madrid, P. Witte).

far mentioned. At Ukhaiḍir (Fig. 8*a*) and in the Ben Yūsuf Madrasa (Fig. 8*b*) it is clear that a hierarchical separation is made between the noble core—the profane formal reception area with its throne room, or alternatively the mosque—and the more lowly functions, dwelling quarters in both instances. But at Tinmal itself this interpretation is unsatisfactory (Fig. 8*c*). Certainly the flanking galleries screen the sanctuary core from the profane outer world: they intercept the busy passage zone of entrances and exits. The smaller, mirrored  allows the court to become another quiet interior, often in fact used as an (open-air) prayer hall. But such a function fails to explain the inclusion of the transept in front of the qibla.

At Tinmal we have to consider another much stronger phenomenon, the focal treatment of the miḥrāb. This is a western Islamic trend which first won its laurels in al-Ḥakam II's extension to the Great Mosque of Córdoba. There the prayer niche had already been made into an almost independent little central room.¹ In Tinmal it is spanned by a complete polygonal vault. In its apex we even find the module that unites the geometric scheme of the whole building.² The muqarnaṣ dome is closely related to the domes of the qibla transept.³

The miḥrāb façade facing the oratory (Fig. 7)⁴—to which we return later—is organized as a decorative focus. The prayer niche, thus singled out, radiates in two directions: in a straight path down the axis of the building, as we shall shortly see, and in an indirect path by the extension of the qibla transept into the three-sided walk enclosing the oratory (see above, p. 116). The radiation and attraction of the miḥrāb works particularly strongly down the axis of the building. The small north gate (Pl. X, right) and the nave entrance from the court (Pl. XIII) are each conceived, both in the form of their arch and in their dimensions, as an 'echo' of the miḥrāb entrance.⁵ But the chief attraction of the miḥrāb operates on the minaret (Pls. VII–VIII): it has been moved south from its customary place on the north

¹ For a more detailed description of the development, in which the intermediary stage in the mosque of the Aljafería in Zaragoza is also taken into account, cf. Ew-Wi 1984, p. 15f, and nn. 85–6.

² For the geometric scheme of the miḥrāb dome cf. Ew-Wi 1984, ch. 2.6.2, p. 134f., plan 24.

³ For the muqarnaṣ vaults in Tinmal cf. Ew-Wi 1984, ch. 1.4, pp. 63–79, ch. 2.6, pp. 119–25, plans 20–5, pls. 64–75.

⁴ Ew-Wi 1984, ch. 1.3, pp. 49–63, plans 5, 7, 9, pls. 54, 55*a*, 56, 59–62; geometric scheme: ch. 2.5.1, pp. 107–14, plan 8.

⁵ Cf. also Ew-Wi 1984, p. 49.

side of the mosque and made to envelop the mihrāb. The call to prayer (from the tower) and the focus of its execution (mihrāb) are combined into an emphatic salient block (Figs. 1, 3, Pls. VII–VIII). The central importance of the mihrāb-minaret block is further emphasized in the layout of the ground plan (Fig. 1);¹ its geometry has been analysed in detail by J.-P. Wisshak.² Alone this largest of the salient blocks, unlike the seven smaller gateways, is included in the almost exact square that circumscribes the ground plan of the mosque. The overriding importance of an exact multiplication by 100 of the unit module in the longest diagonals of the building³ took precedence over the ideal dimensions of this basic geometric figure.

It was already the custom in pre-Islamic architecture to fix the critical dimensions of a building on diagonals. Recently J. Wahl⁴ investigated the Castelo da Lousa in Portugal, a Roman fortified farmstead of the late Republican period. We worked out together the geometric scheme of the core building (Fig. 9).⁵ The dimensions and proportions of the guiding plan are determined by a square with diagonals of exactly 100 Roman feet. This square accounts for three of the four exterior faces of the building. All the essential faces of the interior articulation are also based on the two main diagonals: on them were fixed the meeting points of three inner façades of the outer ring of walls, of all the outer faces of the ambulatory and those of its inner faces, i.e. of the outer faces of the surrounding wall of the little central court, in a rhythm of 10'–20'–10'–20'–10'–20'–10'. The basis is a diagonal scale of $10 \times 10 = 100'$. The geometric skeleton is amazingly simple: starting from the inner faces of the outer walls, three concentric squares were placed orthogonally, each side half the length


¹ Ew–Wi 1984, ch. 2.4, pp. 92–106. For new discoveries see below, p. 131, nn. 1 and 3.

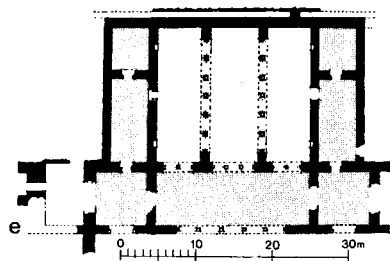
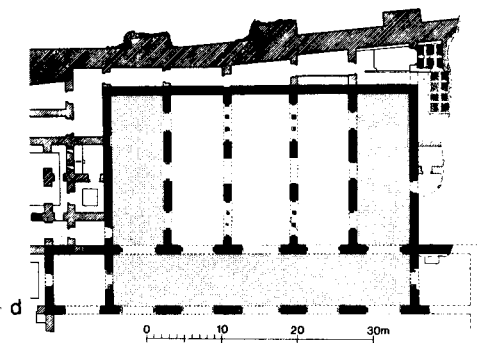
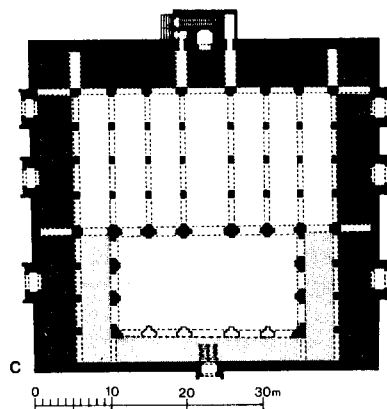
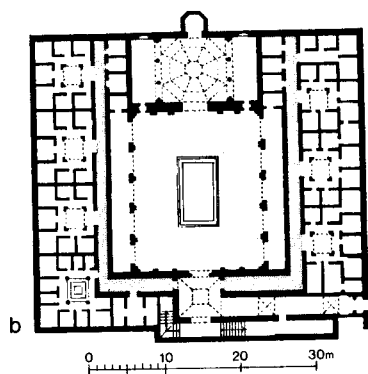
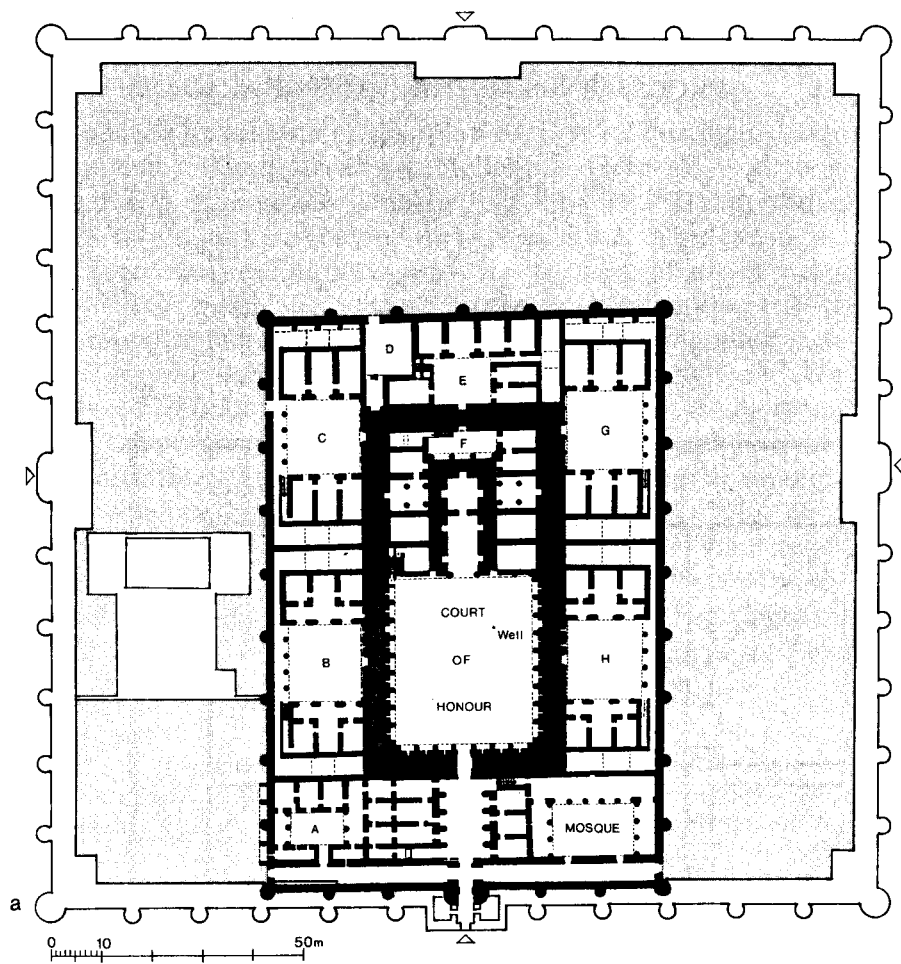
² Description of the separate steps: Ew–Wi 1984, pp. 93–6.

³ For the possible importance of a double construction of two equilateral triangles (proportion = 1:5), based on the main side of the mihrāb-minaret block which includes almost exactly the centre of the bay fronting the mihrāb and the northern corners of the mosque too, see Ew–Wi 1984, pp. 94–6.

⁴ *Madriider Mitteilungen*, xxvi (1985), 150–76.

⁵ Wahl, *ibid.*, pp. 174–6, fig. 10a, plan 2.

FIG. 8.  and ring ambulatory zones in Islamic buildings (stippled grey). a, Ukhaidir, castle; b, Marrakesh, Ben-Yūsuf Madrasa; c, Tinmal, mosque; d, Madīnat az-Zahrā', 'Plain Hall'; e, Madīnat az-Zahrā', 'Salón Rico'. a = 1:1500; b–e = 1:1000 (after Ew–Wi 1984, fig. 7).



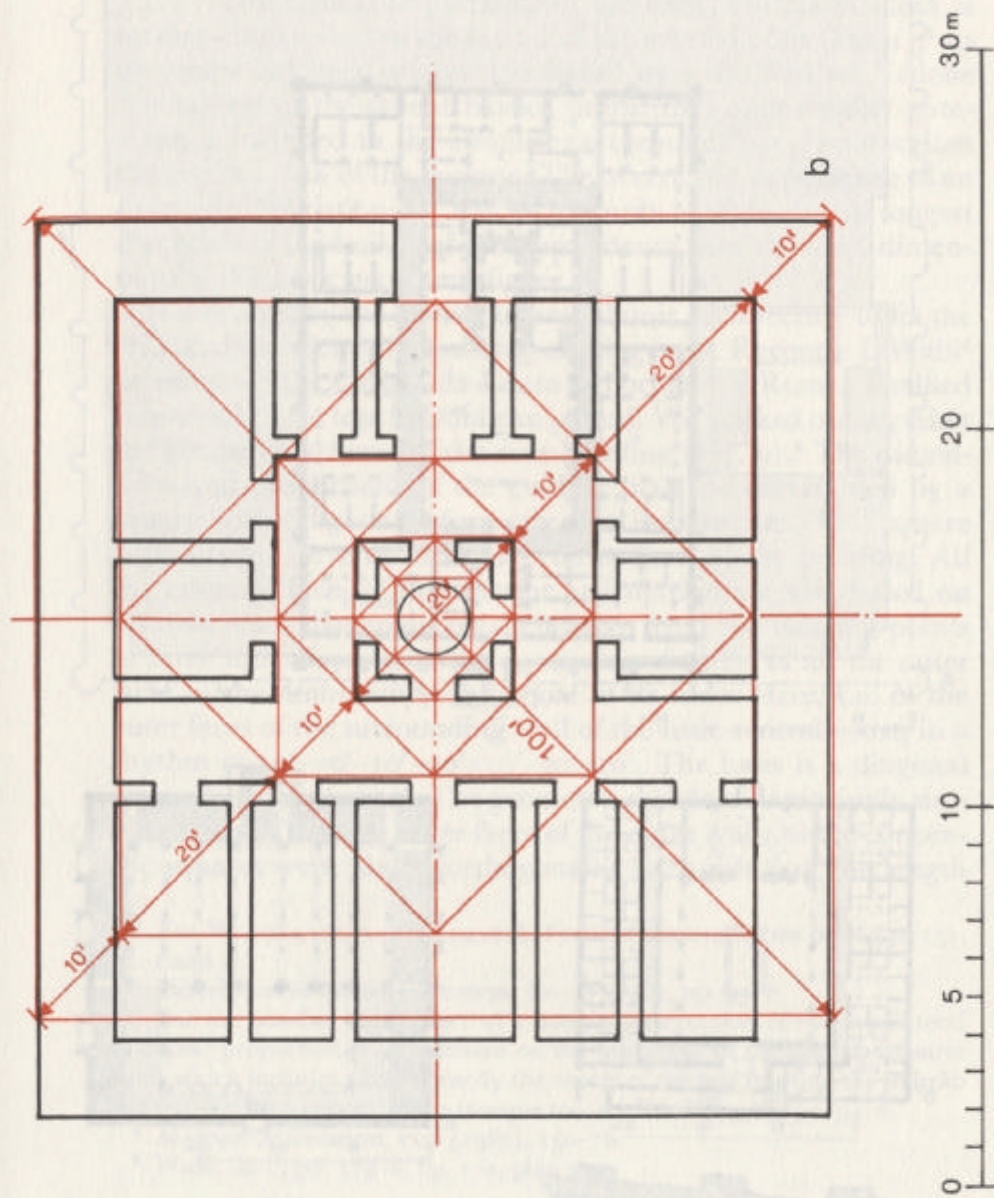


FIG. 9. Late Roman Republic fortified farmstead at Castelo da Lousa, Portugal, core building with geometric and metrological scheme, 1:200 (after J. Wähl, *Madrider Mitteilungen*, xxvi (1985), plan 2).

of the next. The scheme of this plan as seen in Portugal, based on a square, is found already in Hellenistic Greece¹—and there recorded with the main diagonals at 100 Attic feet.² It is doubtless based on Greek methods of land surveying: the square determined by a diagonal 100 feet long encloses an area of exactly half $\pi\lambda\epsilon\theta\rho\nu$.³ The quadratic scheme, for which the constituent interior measurements are determined by the diagonals, was adopted for the Syrian Umayyad desert castles (Fig. 10).⁴ Did the Roman frontier forts play an intermediary role in the transmission, here in the region of the *limes arabicus*? It is hardly surprising to find that in Tinmal after more than four centuries no more than an echo of this pure quadratic scheme remains (Fig. 1). A salient block has here been included in the square. As a result the longest diagonals of the building do not coincide with the diagonals of the theoretical square which surrounds it. Yet it is astonishing that, as in the Roman example, a point is made of

¹ Wahl, *ibid.*, figs. 7–8.

² *Ibid.*, n. 82.

³ *Ibid.*, p. 176 and n. 82; cf. also Ew–Wi 1984, n. 448.

⁴ P. Grunauer, 'Entwurfsprinzip und Metrologie umayyadischer Wüstenschlösser', *Koldewey-Gesellschaft, Bericht über die 28. Tagung* (1975), pp. 19–23. The multiplication by 100 of the unit of measurement (here in Umayyad Syria the so-called Nilometer cubit = 54.04 cm) is found at Qaṣr al-Ḥair al-gharbī as the measurement of the courtroom (Fig. 10b; this probably also explains the slight widening of the court in only one direction in the smaller encircling wall of Qaṣr al-Ḥair ash-sharqī: Fig. 10d, right). In the court of the castle itself in Usaïs (Fig. 10a) and of that at Khirbat al-Mafjar (Fig. 10c) the surrounding portico is included; in Mshattā (Fig. 10d) the diagonal of the open court measures 150 cubits. (The corresponding measurement in the court of the larger complex of Qaṣr al-Ḥair ash-sharqī has had to be revised since the excavations of O. Grabar; cf. Grunauer, *ibid.*, appendix, p. 23.)

It would be satisfactory to establish that the indubitably quadratic concept of the ground plan of the foundation phase of the Great Mosque of Córdoba was imported from Syria: the founder is the first Umayyad ruler in Spain who immigrated direct from Syria. Grunauer calculates from the measurements of the ground plan published by F. Hernández Giménez (*El codo en la historiografía árabe de la mezquita mayor de Córdoba*, Madrid, 1961, fig. 1) a diagonal of 200 Nilometer cubits (*ibid.*, p. 20). The use of a common metrological scheme by the Umayyads for both castle and mosque building would fit excellently with the observations I shall be making below on the exchangeability of geometric-metrological elements in (west-) Islamic architecture. Hernández Giménez (*ibid.*), however, can only decide on two groups of units of measurement (ma'mūnī cubit and rashshāshī cubit) from his very searching comparison of the sources and the measurements obtained from his survey of the building. Their respective average values (47.14 and 58.93 cm) diverge considerably from the Nilometer cubit (54.04 cm). Nor can the frequently proven unit value of 64.0 cm for Tinmal and other Almohad buildings help with this problem.

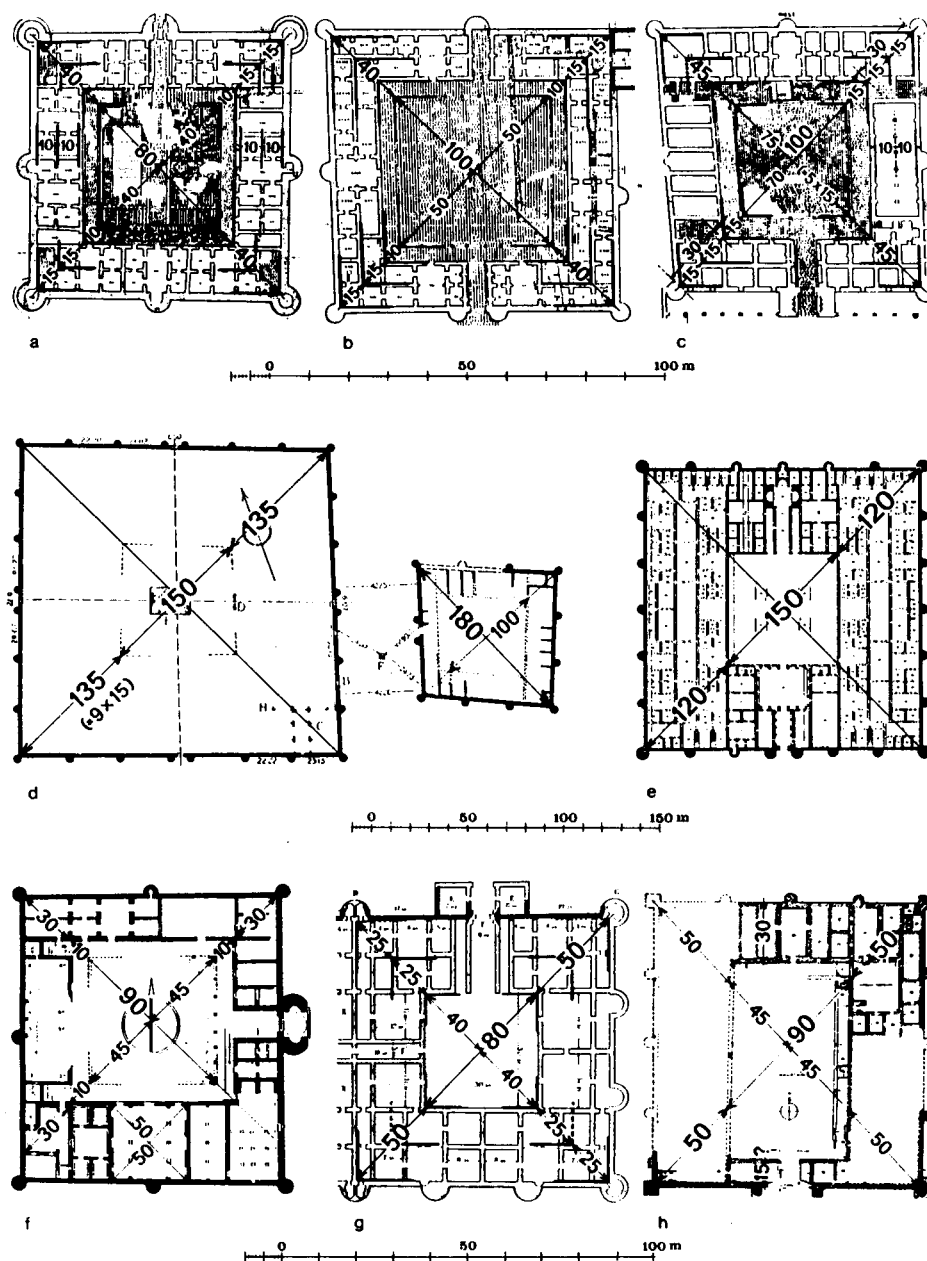


FIG. 10. Umayyad desert castles, metrological scheme. *a*, Usais; *b*, Qaşr al-Hair al-gharbî; *c*, Khirbat al-Mafjar; *d*, Qaşr al-Hair ash-sharqî; *e*, Mshattâ; *f*, Minya; *g*, Qaşr at-Tûba; *h*, Ruşâfa. *a-c*, *f-h* = 1:2000; *d-e* = c.1:4000 (P. Grunauer, *Koldewey-Gesellschaft*, 28. Tagung (1975), figs. 2a-3c).

using the hundred-fold multiple of the unit for the longest diagonals of the building. A subdivision into ten units is also found more than once: for the diagonals in the plan and elevation schemes of the only surviving transept dome, and especially in the standard square that is determined by the axes of four sanctuary piers in a standard aisle. Turned into the orthogonal position, the ten-fold multiple of the unit fixes the axial width of the central nave. It seems certain that the decimal system so consistently employed by the Romans was adopted by Islam not just sporadically but with full understanding.

The ultimate origin of the geometric scheme that can be demonstrated in Tinmal is thus conceivably profane.¹ With the Greeks and Romans what lay behind the scheme was a desire for economic standardization of defensive buildings. In early Islam we find it again in a group of buildings that belongs to the tradition of the classical *castellum*.²

Furthermore, the form of the salient block, so ideally adapted to the requirements of the mosque, which rises out of the geometric scheme and gives Tinmal its strikingly characteristic appearance (Figs. 1, 3, Pls. VII–VIII), is by no means an innovation fabricated for Almohad mosque architecture; once again its closest parallel is not a sacred building.

Starting in the tenth century there are examples in the Islamic West of palaces where the rectangular outer wall is interrupted by rectangular salients. The early Fāṭimid 'Fortress Palace' near Ajdabiyya in Libya³ is a link between the Umayyad tradition, which had round corner towers, and the new type. The ground plan is already elongated in the 'Abbāsid proportions. Rectangular salients appear in the middle of the sides of the surrounding wall. Blake, Hutt, and Whitehouse⁴ propose 972 as a hypothetical date; they lay stress on the close connection with the palace of Zīrī in Ashīr (Fig. 11)⁵ and even suggest that the architects were

¹ This basic fact should not be lost sight of when considering the influence of specifically Islamic, e.g. Sufi, number mysticism on geometric-metrological systems of this kind. On the other hand, the possibility of the spiritual or indeed religious penetration of a 'profane' scheme should not be excluded, in view of the degree of sublimation in the 'multi-layered' system achieved in Tinmal.

² For the, in my opinion not yet adequately proven, use in early Islamic sacred building cf. p. 125, n. 4.

³ For this building and its bibliography cf. C. Ewert, *Spanisch-islamische Systeme sich kreuzender Bögen*. iii. *Die Aljaferta in Zaragoza*, i (1978), 13, n. 83.

⁴ World of Islam Festival, exhibition catalogue, *Islamic Art and Architecture in Libya* (London, 1976), p. 67.

⁵ In modern Algeria. For this building cf. especially L. Golvin, 'Le Palais de Zīrī à Achīr (dixième siècle J. C.)', *Ars Orientalis*, vi (1966), 47–76.

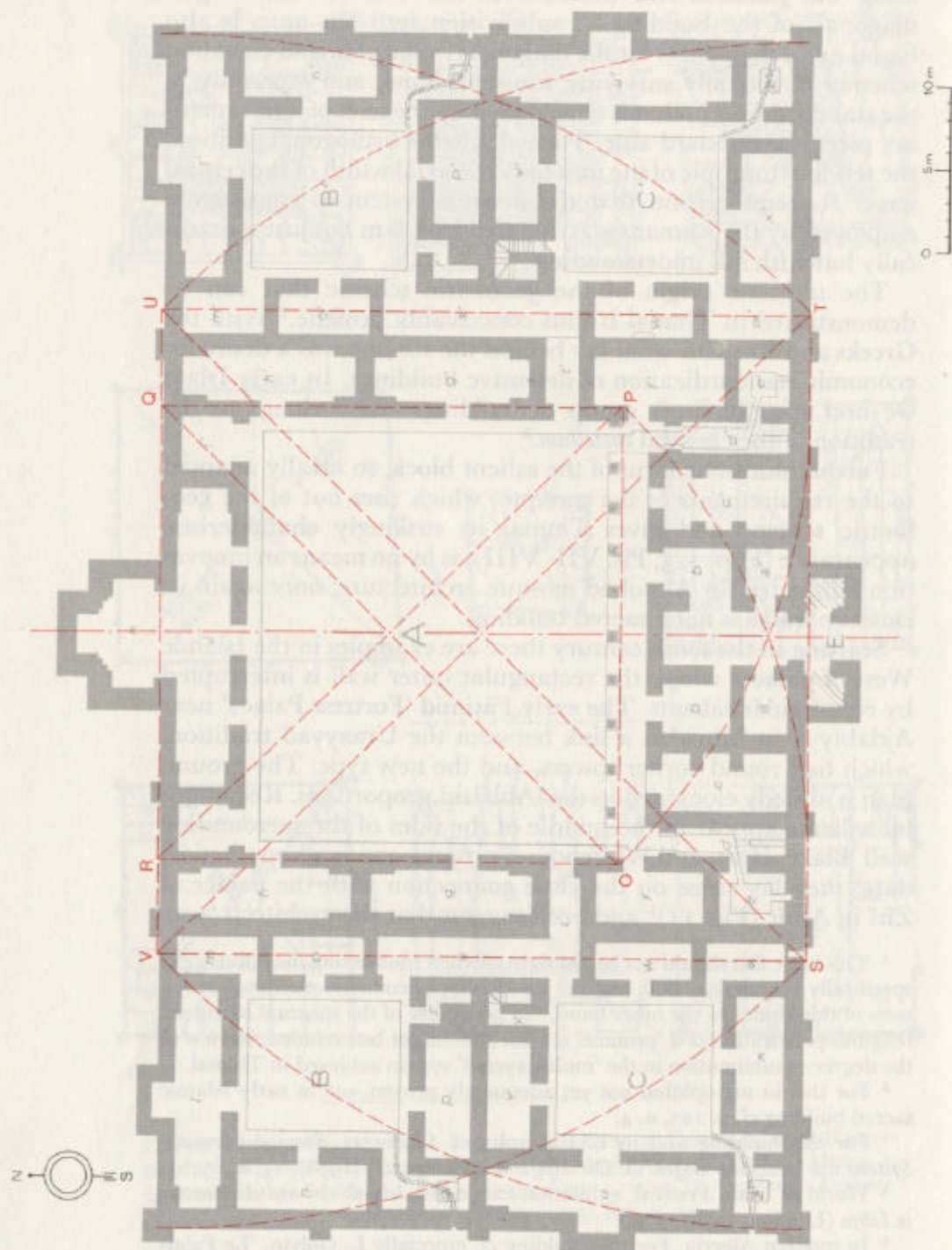


FIG. 11. Palace of Zūri at Ashūr, Algeria, ground plan with geometric markings, 1:400 (L. Golvin, *Arch. Orientalis*, vi (1956), fig. 1:1, geometric).

the same. The exterior of Ashīr, however, has no traces of the Umayyad type. Here two salients in the depth axis of the building are dominant.

The date alone suggests a close comparison between the mosque of Tinmal and the Norman palaces of Palermo. In research for her dissertation on the Zisa U. Staacke is at present investigating minutely Islamic influences¹ which have already occupied earlier scholars.² She brings various separate functional elements into relationship with the early oriental, i.e. Umayyad and 'Abbāsid, and with Aghlabid, Fāṭimid, Zīrīd, and Ḥammādid castle architecture of hither North Africa. She gives greater depth to this typological discussion by also investigating the geometrical scheme.

The Zisa (Fig. 12, Pl. XV) was built in the decade following the erection of the mosque of Tinmal. It was begun in 1165, and a year later, at the death of William I, the building was already far advanced.³ The recognized typological similarity of the Zisa to Zīrī's palace in Ashīr⁴ is underlined by U. Staacke with arguments based on the geometry of the ground plan (Figs. 11-12). The identical proportions of the outer ring of walls in both buildings is explained by being based on an identical geometric construction built up in several stages: the diagonal of a basic square gives a second square that is extended again over the diagonals.⁵

In considering the external articulation, however, the comparison of the Zisa (Fig. 12) with Ashīr (Fig. 11) is not wholly

¹ The kindness of the Italian authorities in charge of the Preservation of Ancient Monuments, especially of the director of the restoration, Prof. G. Caronia, and financial support through the Deutsche Akademische Austauschdienst has allowed U. Staacke to carry out fundamental investigations on the site over many months. She was also able to use the superb large-scale architectural drawings of the Italian Ancient Monuments Authority.

² Cf., e.g., G. Marçais, *L'Architecture musulmane d'occident* (Paris, 1954), pp. 118-27.

³ U. Staacke, unpublished draft for doctoral thesis, 'Bericht', p. 2. G. Caronia (*La Zisa di Palermo* (Rome and Bari, 1982), p. 50) gives 1165-75 as the building period.

⁴ Marçais (op. cit., p. 122) cites the Qal 'at Banī Ḥammād from the same north African region of the central Maghreb for comparison. Caronia (op. cit., p. 50) postulates direct relationships. He ascribes the distribution of rooms of the Zisa to north African architects who came to Sicily after the destruction of the Qal'a.

⁵ This practice of square extension is proved already for geometric schemata in Roman domestic architecture: cf. H. Geertman, 'Geometria e aritmetica in alcune case ad atrio pompeiane', *Babesch*, lix (1984), figs. 1 (representation of the theoretically endless chain of possible extensions), 2, 8, 11, 21; id., 'Vitruvio e i rapporti numerici', *ibid.*, figs. 1-2.

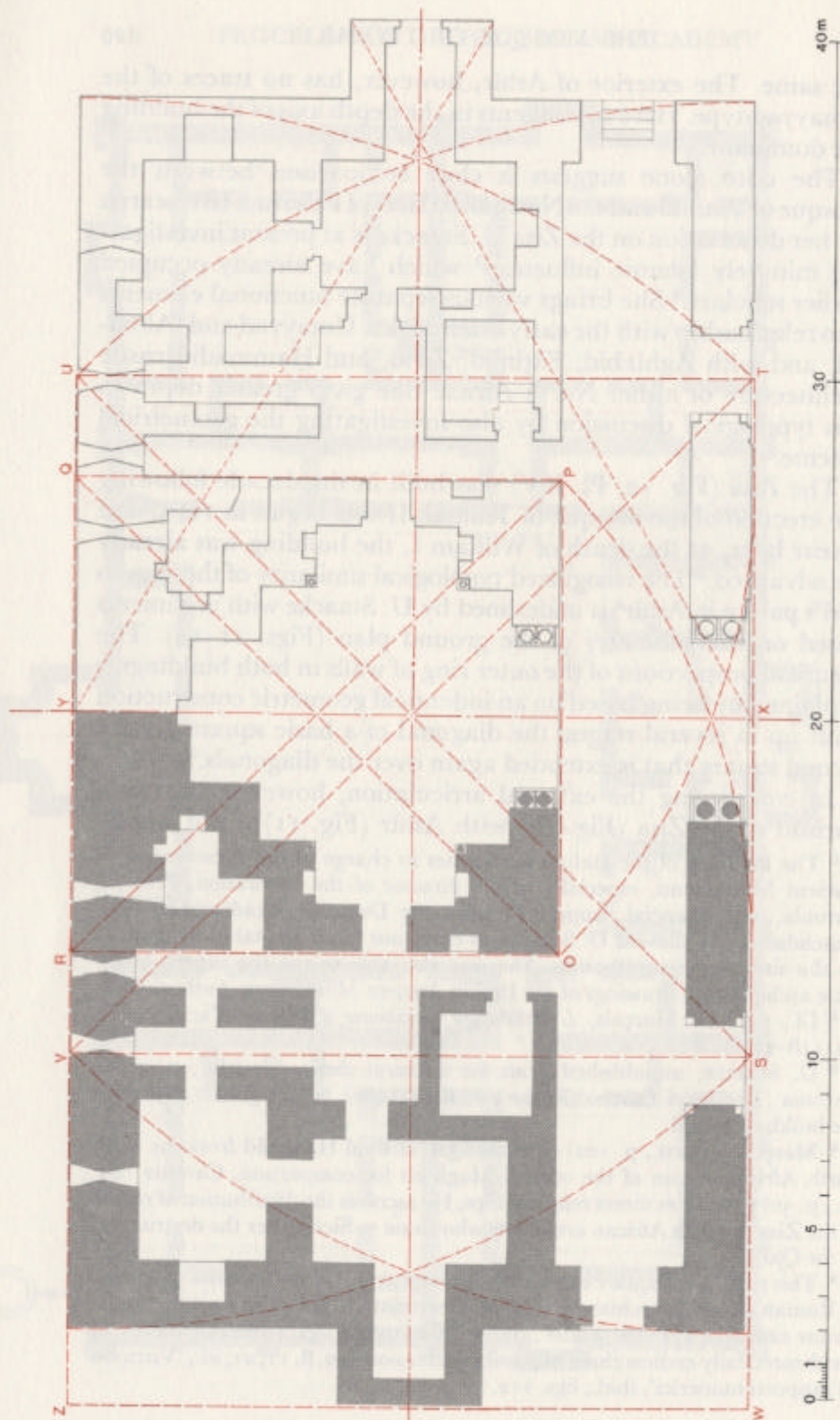


FIG. 12. La Zisa, Palermo, ground plan with geometric markings, 1:200 (U. Staacke, unpublished dissertation).

adequate. A crucial modification has been made to the Zisa: two imposing, identical salients are intruded into the long axis of the building. The key to understanding is provided, we submit, by the scheme of the nearly contemporary mosque of Tinmal: only one half of the scheme of the Zisa is executed there (cp. Fig. 12 with Fig. 1).¹ As proof we adduce the relationship, indeed the identity of basic figures and proportions in both monuments: of the enclosing squares and of a double triangle.² If in the Zisa two squares are constructed symmetrically on the long axis, the short sides of the double square coincide with the long face of each salient (Fig. 12, left: W-Z). If the outer corners of each salient are joined diagonally with the respective opposite corners of the enclosing basic square of its own half of the building, i.e. with the centres of the longitudinal façades, they give once again the scissor figure of two equilateral triangles with their sides almost exactly in the proportion 1:5; i.e. the long side of each salient amounts again almost exactly to one-fifth of the side of the enclosing wall in which it stands.³

¹ The correspondent basic squares of the geometrical constructions for Tinmal, Ashīr, and Palermo (Figs. 1, 11-12) bear identical letters.

Only the basic additions to our earlier published Tinmal scheme (cp. Fig. 1 with Ew-Wi 1984, plan 2) will be mentioned. On the external front of the qibla the ideal total width of the building was realized: the side of the two basic squares of the scheme. Their intersection figure is the rectangle S-V-X-Y, whose subdivision produces the width of the court: in its transversal axis, which is the second symmetry axis of the whole ideal scheme of Tinmal, its ideal width is exactly realized, i.e. half the width of the qibla.

On the narrow artificial terrace (at the foot of the mountain) the northern half of the northern basic square (T-U-X-Y) could not be executed. For the depth of the mihrāb-minaret block a simple auxiliary construction was possible on a short southern prolongation of the diagonal X-Z: U-Z = X-Z'; Z-Z' = depth of the great salient block.

² For the double triangle in Tinmal cf. p. 122, n. 3.

³ A unit of measurement common to the whole of the Zisa has not yet been found. However, if one traces in the doubled scheme of Palermo the distances corresponding to the longest building diagonals of Tinmal, i.e. those between one corner of the surrounding wall, thus an end of a long façade, and the centre of the opposite wall, i.e. of the diagonally placed opposite corner of the basic square involved, one finds 26.79 m, very close to 27 m or 50 Nilometer cubits; a cubit unit is reckoned at 53.58 instead of 54.04 cm. (In Tinmal, on the other hand, a unit of almost exactly 64.0 cm could be determined.) The longest diagonals of each part of the scheme corresponding to Tinmal are halved: 100 against 50 cubits; in absolute terms: c.64 against c.27 m; thus the absolute area is considerably reduced in Palermo.

Reinforced by the discoveries mentioned above about Roman architecture (p. 122) we assume hypothetically that the measurements of the scheme expressed in units were understood only as proportion indicators and not

[Footnote 3 continues on p. 132]

The comparison between the mosque of Tinmal and the Zisa appears at first sight surprising. A mosque, endowed with extra sanctity as the memorial to the founder of a religious reform movement, is connected with a pleasure palace—two buildings at the opposite poles of functionality. Not only has an isolated element of the exterior, the dominant salient, been transmitted; the whole structure, the surrounding wall and salient have a specific relationship.

It is worth examining once more the motif that so strangely characterizes the exterior of Tinmal, the mihrāb-minaret block (Fig. 1, Pls. VII–VIII). As a mosque tower it does not fit into any type series known to me.¹ Its location on the ‘wrong’ side of the mosque² is as unusual as its departure from the usual square ground plan and as its short stature.³ But this is in fact an adequate description of the salient block usual in palace buildings. In ground plan its proportions and even its absolute dimensions approximate strikingly to the corresponding figures for the gateway, i.e. one of the main salients, in Ashīr (cp. Fig. 1 with Fig. 11) Did palace architecture provide a not inconsiderable stimulus in the design of the strange aspect of the mosque building in Tinmal?

Only now after establishing the possibility of influence of palace architecture on mosque architecture do I dare to put forward a hypothesis to explain a second unusual Almohad mosque design.

converted into local absolute dimensions until the installation was begun on the ground. In contrast with the Roman sphere of dominion where the Roman foot was virtually universal, in the various Islamic realms and spheres of influence there were numerous different cubit units (cf. W. Hinz, *Islamische Masse und Gewichte* (Leiden, 1955), pp. 55–64).

¹ Basset and Terrasse, op. cit. (p. 115, n. 3), p. 51, figs. 10–11, cite as the only parallel a small tower in Salé, probably the remains of a mosque. L. Golvin (D. Hill and L. Golvin, *Islamic Architecture in North Africa* (London, 1976), p. 128) only adds the (now destroyed?) Sīdī Ramḍān Mosque in Algiers for North Africa. In the Syrian Umayyad building sphere, I only know the ‘mihrāb tower’ of the small oratory in the castle of Khirbat al-Mafjar (cf. R. W. Hamilton, *Khirbat al Mafjar* (Oxford, 1959), p. 34; ground plan: *ibid.*, pl. 100).

² The lay of the land favoured the positioning: the tower faces the verdant valley (Pl. VI).

³ Basset and Terrasse, op. cit. (p. 115, n. 3), p. 51, appear to consider the method of construction of the roof terrace to be original, and infer from it that the bearing capacity of the platform was defective. The additional upper room otherwise typical of western Islamic minarets is therefore unthinkable, and the tower was originally scarcely higher than now. This conclusion agrees with our observations on its proportions (Ew–Wi 1984, pp. 116, 126, plans 3, 6).

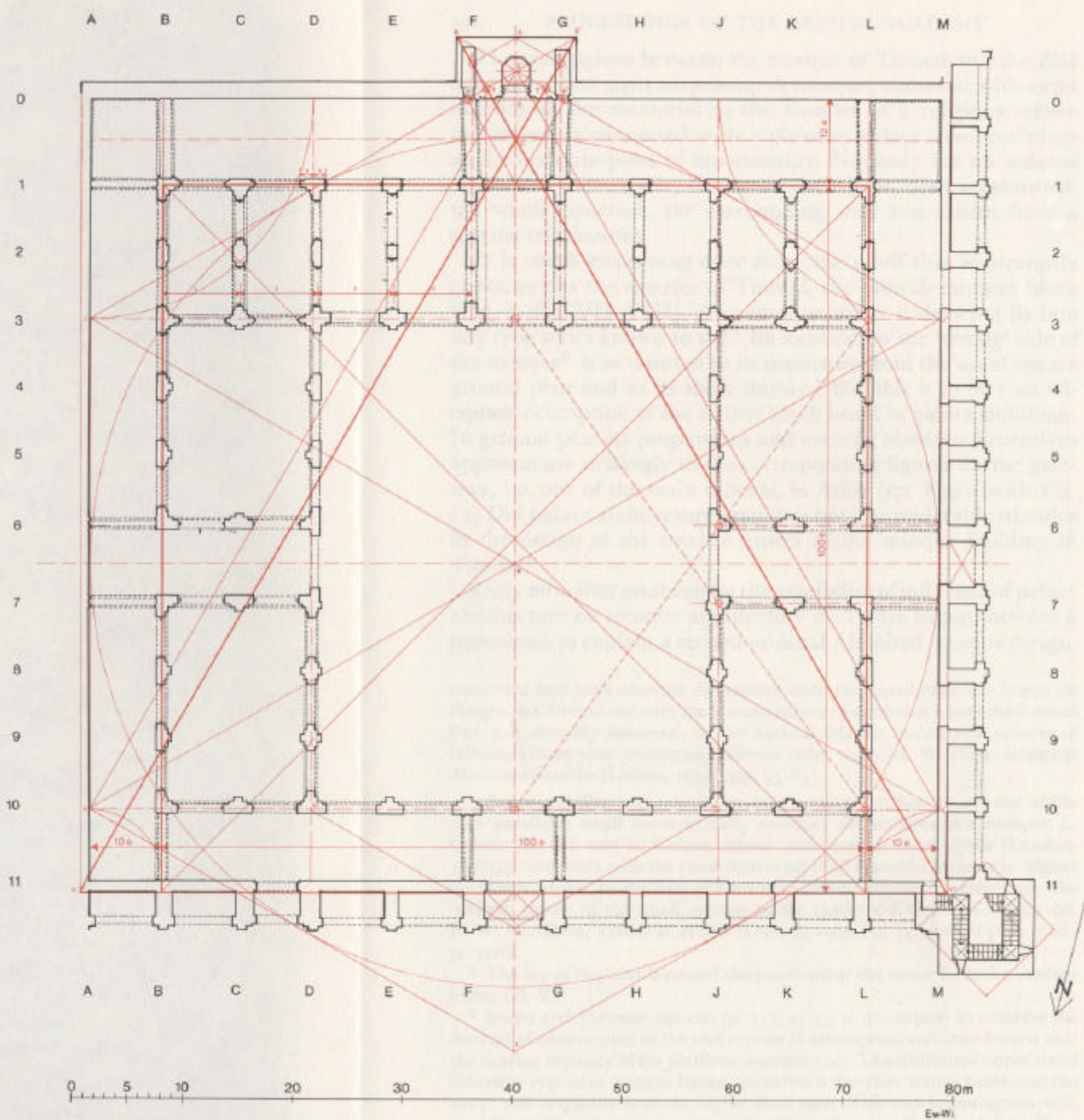


FIG. 13. Qasba mosque at Marrakesh, reconstruction of Almohad ground plan with geometric scheme, 1:500 (C. Ewert and J.-P. Wisshak).

[Facing p. 133]

The Qaṣba Mosque in Marrakesh (Fig. 13, Pls. XVI–XVIII)¹ belongs to the last years of the twelfth century. Investigations² allow us to assume that the Sa'dite restoration campaign of the late sixteenth century did not affect the ground plan of the building (Fig. 13) in any essential way. The analysis of the geometric scheme³ also argues strongly for its being an Almohad design. It is closely related to Tinmal (cp. Fig. 13 with Fig. 2). Once more a square overlaps with a scissor figure laid out from the mihrāb block with two equilateral triangles of different sizes.⁴ The use of the same cubit unit as in Tinmal⁵ seems also to argue for the continuity of the workshop tradition.

As in Tinmal the exterior, in the Qaṣba Mosque the interior articulation does not fit into any satisfactory typological classification of sacred buildings. It is dictated by an accumulation and grouping of courts unusual in a mosque. The central main court is deeper than the relatively shallow courts which are typical of the Almohad sanctuaries, as in the original design of Tinmal and even in the gigantic Ḥassān Mosque in Rabat.⁶ Seven bays deep, the courtyard of the Qaṣba Mosque forces the qibla riwāq right back: the qibla riwāq is only two bays deep, and eight standard side aisles peter out at the transept in front of the qibla. The transept is here part of a walk that now surrounds the whole core of the mosque, a walk foreshadowed in Tinmal in the interlocking of the two three-sided galleries. The exceptional depth of the main court is explained by the addition of four subsidiary courts. They are arranged symmetrically in pairs, on the two flanks of

¹ For this building cf. especially Basset and Terrasse, *op. cit.* (p. 115, n. 3), pp. 274–310. For our own investigations see next note.

² J.-P. Wisshak and I carried out a building survey in the summer of 1978. We were able to make a special study of the piers and floors in the courts. In the Sa'dite restoration campaign apparently only the profile of one part of these supports was altered, but not their positions. The results of our investigations will shortly be published: C. Ewert and J.-P. Wisshak, 'Forschungen zur almohadischen Moschee, III, Die Qaṣba-Moschee in Marrakesh', *Madrider Mitteilungen*, xxviii (1987).

³ This again was undertaken by J.-P. Wisshak and is already finished. It will shortly be published with the rest of the results of our investigations (cf. previous note).

⁴ The sides of both triangles are related at *c.* 1:7 (cf. Fig. 13); the reasons for the inaccuracies in the execution of the building will be discussed by J.-P. Wisshak in the publication.

⁵ After our comparative measurements *in situ* we can assume it for the Kutubiyya and the Ḥassān Mosque as well (cf. Ew-Wi 1984, pp. 90f. and nn. 468–74).

⁶ For this building cf. especially the monograph by J. Caillé, *La Mosquée de Hassan à Rabat* (Paris, 1954), ground plans: *ibid.*, figs. 44–6.

the main court, separated from it only by a *coulisse*-like arcade. They are only two bays wide, but three bays deep, thus equalling the depth of the only court in the original design of Tinmal.¹ They are separated from each other by an aisle (Pls. XVI, XVIIIb), which, laid in the transverse axis of the main court, corresponds to the central aisle of the qibla riwāq, but looks a bay deeper as it cuts smoothly through the ring walk, no separating transverse arch having been inserted. The transverse arcade of the qibla continues without stopping; on the other hand, the nave and transept of the qibla riwāq interpenetrate, and even in this unusual building the dome fronting the mihrāb is retained, as are also the two vaults at the southern corners of the building.² On the north side too the ring walk is interrupted in the axis of the main court, though only by a nearly square compartment which is probably to be understood as a projection of the central nave of the qibla riwāq. The four spatial elements laid out on the axes of the main court—the central nave of the qibla riwāq, its projection on the north, and the two aisles separating the subsidiary courts to east and west—are also emphasized in the continuous façade arcades of the main court: each is marked by a wider and slightly higher central arch (Pls. XVI–XVII). Standing in the main court one is reminded of a mosque with four iwāns. The proportions, however, are strongly toned down; the spatial elements leading into the depth lack what is so characteristic of the oriental type: the monumental weight that dominates the flanking elements.³ Yet this subsidiary interpretation can perhaps prompt further thoughts. The pre-Islamic models of the four-iwān layout are to be found not in sacred but in palace architecture.⁴ Did this sphere also contribute the motif of the side courts flanking the main court in pairs, as our comparative series finds them foreshadowed in Ashīr as well (Fig. 11)? Did the

¹ For the postulated project of a riwāq on the north side of the court in the mosque of Tinmal cf. especially Hassar-Benslimane *et al.*, *op. cit.* (p. 116, n. 7); cf. also Ew–Wi 1984, pp. 1, 5.

² Like the mihrāb façade the vaults of the transept fronting the qibla were renewed in the Sa'dite restoration campaign: they show the typical small-scale muqarnaş work of this period.

³ Nor is the uniform height of the cornice, at least today, after the Sa'dite restoration campaign, cut through.

⁴ e.g. the Parthian palace in Assur (A. U. Pope and Ph. Ackerman, *A Survey of Persian Art*, i (London and New York, 1938), 432–5, figs. 106: ground plan; 107: reconstruction of the court façades). Sāsānid architecture transmitted this type to the early Islamic: it survives very clearly, e.g., in the Dār al-Imāra in Kūfa (Creswell, *EMA*², i, 1, 48–58, fig. 18: ground plan).

ruler consciously have the idea of a palace included in the design of his palace mosque, and did the idea become sublimated once its function was removed? The separation of main and subsidiary courts no longer needed to be carried through strictly, as a barrier, in Marrakesh, but only needed to be suggested by open arcades, the only elements of partition in this layout, which repeatedly reveal enchanting vistas to the beholder (Pl. XVIII).

Let me, hedged with all necessary caution, advance an extended interpretation. Might the diaphanous image of a heavenly palace in Paradise, such as perhaps had already been displayed to the eyes of the believer in the mosaics of the illustrious Umayyad mosque in Damascus,¹ here have been intensified to monumental three-dimensionality?

We have had to learn that Islam recognizes no strict separation in architectural design between the 'sacred' and the 'profane'. Our investigation about the exchangeability and mixing of elements has so far remained within the boundaries of monumental architecture. For better understanding of the ground plan design in Islamic sacred architecture it is necessary also to admit the part played by the supposedly purely decorative.

The motif of the three-sided ambulatory examined at the start of this paper must be looked at again. In Tinmal it appears in the dominant broad alfiz of the mihrāb façade (Fig. 7, Pl. XIV), that is to say, in the elevation as well as in the plan. The basic motif is a regular eight-pointed star produced by overlapping two squares. It and its two variants are carried round in a single rhythmically articulated series. The basic star appears in its pure form at the five cardinal points: at each foot which is drawn down slightly below the impost level, in the upper corners, and in the symmetrical axis of the façade; only in the longest, horizontal, arm of the alfiz is the centre distinguished. A cartouche, composed of two similar units merged together, is attached to each of the four end or corner stars in each arm. In the middle of the vertical arms a shortened unit is inserted between the elongated ones; the flat-standing square of the regular basic star is compressed into a rectangle of only about half its length. Two similarly compressed stars flank the central regular star in the mihrāb axis; the central area of the horizontal arm is thus further singled out.

¹ The most concise summary of the controversial debate on the significance of the mosaics in Damascus (earthly topographical or heavenly paradisaal evocations?) is given by B. Finster ('Die Mosaiken der Umayyadenmoschee von Damaskus', *Kunst des Orients*, vii (1970/1), 117f.). The authoress argues strongly for a paradisaal interpretation (ibid., pp. 118-21).

In the horizontal long arm the three orthogonal squares of the regular basic star in the centre and at the penetration area with the vertical arms, i.e. in the upper corners, have a special impact on the beholder. The basic articulation of the transept in front of the qibla, the alternation of squares and elongated compartments, corresponds. The triple group in the centre of the alfiz, central cell and flanking narrow spaces, is reminiscent of the ensemble of the ante-mihrāb compartment and flanking arcades, which are given the value of independent compartments by the wider uniquely decorated soffits and especially by the doors between the bounding columns. If it is assumed that the horizontal arm of the alfiz can be read as a 'transept abbreviation', the inclusion of the whole alfiz is worthy of comparison with the basic structure of the building: like the three-armed main ambulatory of identical form the alfiz frames a core area. In the elevation of the mihrāb façade (Fig. 7) a structure already present in the general ground plan of the mosque (Figs. 1, 8c) is repeated. The connection is not merely formal. The identical dispositions grow out of the basic requirement that dominates the layout of all the important parts of the sanctuary, that of emphasizing the mihrāb.

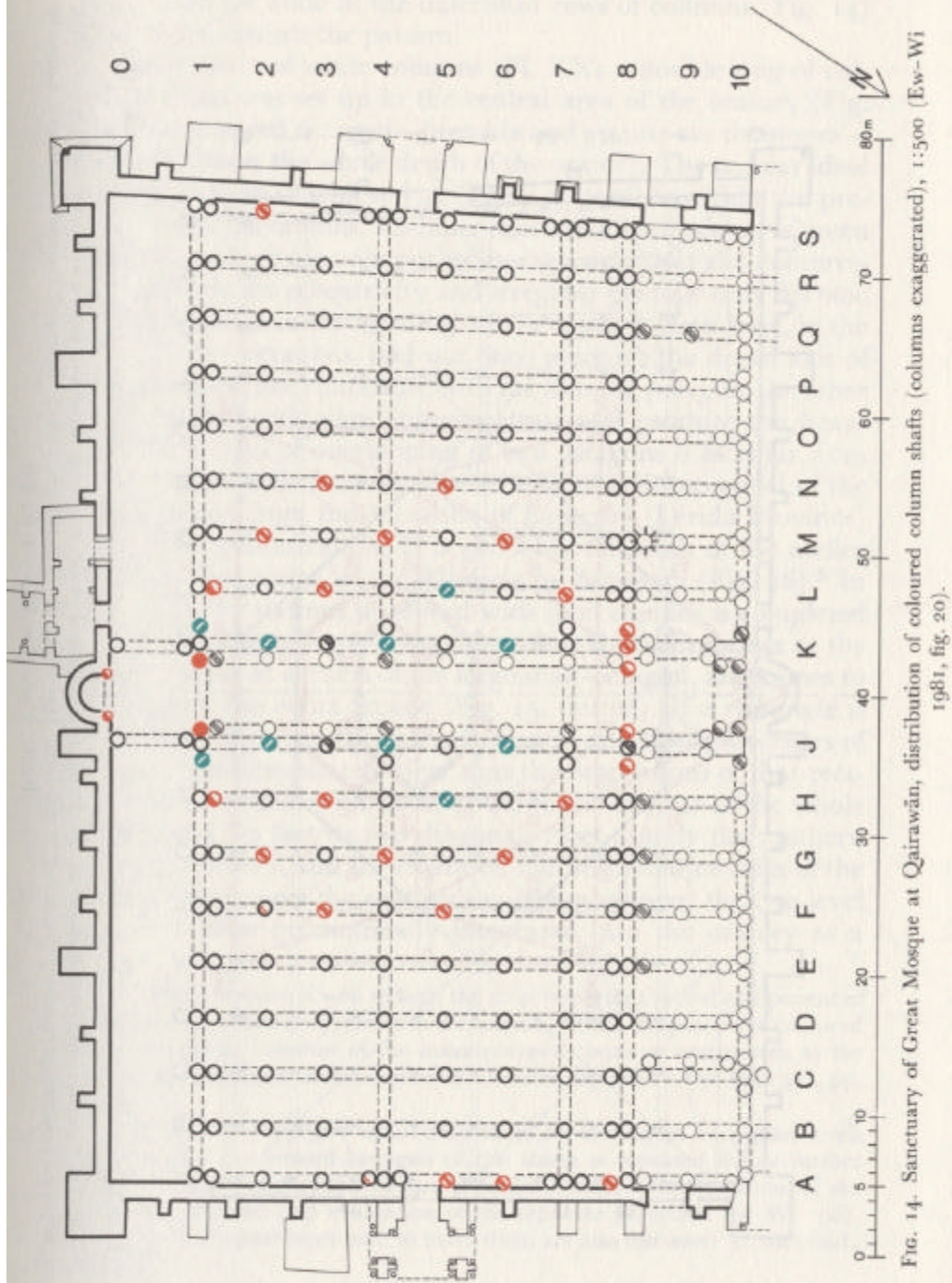
While in Tinmal our discernment of a link between motifs of ground plan and of decoration starts with the decoration of the elevation, we find these components united in a much earlier stage of the design, in the general picture of the ground plan of a much earlier building, the Aghlabid oratory of the Great Mosque of Qairawān (Figs. 14-15, Pls. XIX-XX), which, as we have seen, anticipated the T-type so characteristic of Tinmal.¹ In the primary given grid of columns—both shafts and capitals² are all Roman and Byzantine spoils—a structure is encoded that at the first stage of consideration can only be defined as a geometric net pattern in two layers.³

The pieces to be placed on two horizons were carefully arranged: presumably the actual pattern was laid out first with shafts of special colour or with rarer types of capitals, and then the ground was filled in with white shafts or irregularly with Roman, less frequently with Byzantine, standard capitals. Surplus coloured

¹ The view onto the roof terrace (Pl. XIX) shows it up quite clearly: the central nave (stressed even further by a dome at either end) and the transept are singled out.

² For the spoil capitals of the qibla riwāq cf. Ew-Wi 1981, Appendix 1, pp. 139-55, pls. 36-49. Complete catalogue of the spoil capitals in the mosque: N. Harrazi, *Chapiteaux de la grande mosquée de Kairouan* (Tunis, 1982).

³ Ew-Wi 1981, pp. 31-49.



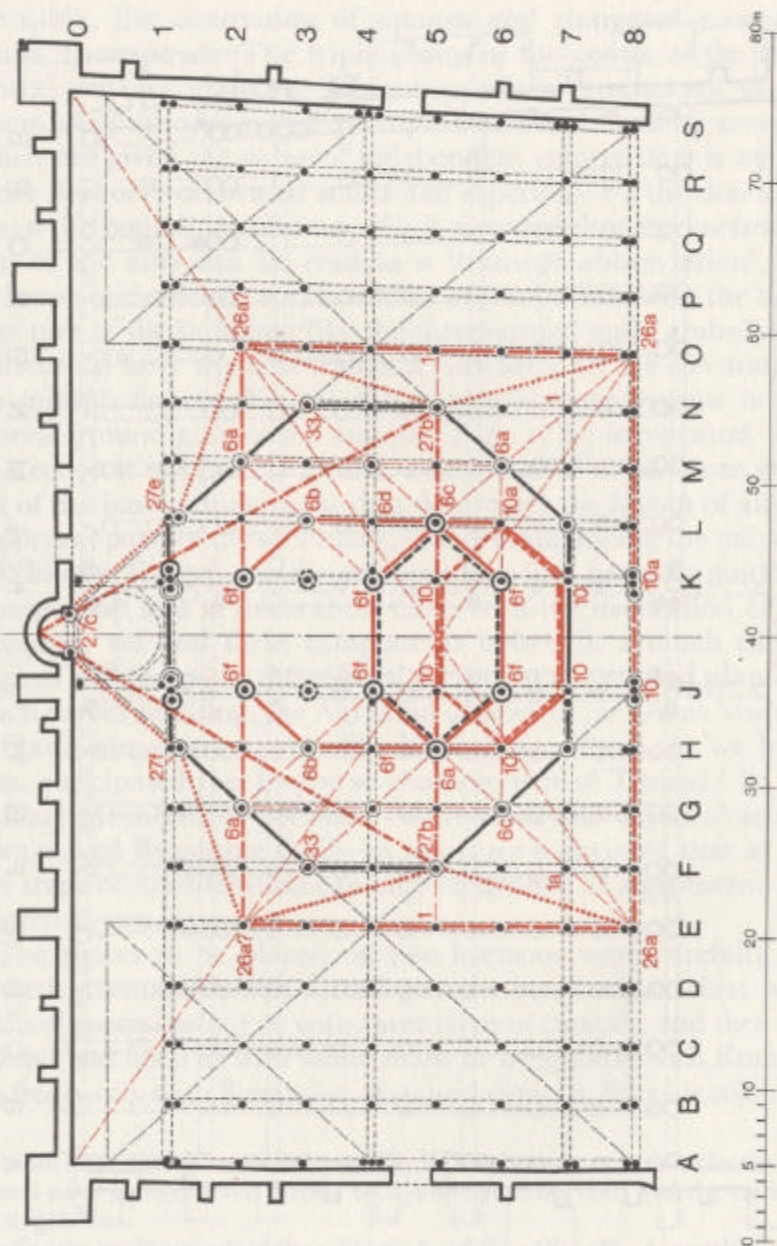


FIG. 15. Sanctuary of Great Mosque at Qairawān, first Aghlabid phase, geometric figures in plan marked by capitals (including eccentric octagon, presumably conceived at this level, J4m-K4m, H5-L5, H6-L6, J7m-K7m in red; coloured shafts and figures in black), 1:500 (Ew-Wi 1981, fig. 23).

shafts were set aside in the outermost rows of columns (Fig. 14) so as not to disturb the pattern.

In the forest of white columns (Pl. XX) a double ring of coloured shafts was set up in the central area of the oratory (Fig. 14). An outer red octagon—breschia and granite are the stones—encloses almost the whole depth of the oratory. The regular ideal geometric form is achieved as closely as possible within the prescribed grid of columns. An inner much smaller hexagon of green breschia shafts is not only pushed northwards,¹ but also compressed in depth. Its eccentricity and irregular contour only become comprehensible in the 'reading' of the upper pattern level, in the capitals: two octagons, laid out once more on the depth axis of the sanctuary, one concentric with the framing polygon, the other touching its north edge, interpenetrate and produce the hexagon.² This kind of overlapping of two octagons is familiar from Islamic surface decoration. The scheme of a stucco panel of the Tā'ifa period from the Alcazaba of Balaguer (Lérida Province) may serve as illustration. It is probably the work of the atelier that was also active in the Aljafería in Zaragoza (Fig. 16).³ In Qairawān the pattern produced with spoil capitals is completed by a figure suggesting a five-pointed star that culminates at the mihrāb, turns at corners of the large shaft-octagon, and comes to rest against the court arcade (Fig. 15, dotted). If a rectangle is constructed between the extreme eastern and western corners of this star it is immediately clear that the proportions of that rectangle are identical with those of the inner contour of the whole qibla riwāq. In fact its two diagonals meet exactly the southern oratory's corners, and the extended southern oblique sides of the large octagon meet the oratory's northern corners; the two-level pattern is thus geometrically integrated into the oratory as a

¹ In this way space is won to keep the most important sacred component of the T-type, the central approach to the mihrāb, within the pattern of coloured shafts: the green columns of the inner polygon continue southwards as the bounding columns of the central nave. Detailed argument: Ew-Wi 1981, pp. 37, 48.

² The eccentric octagon again only arises by looking at both plan levels together: the compressed hexagon of the shafts is repeated a bay further north, in the configuration of the capitals. Detailed consideration of the geometric relations and evaluation of the separate polygons: Ew-Wi 1981, pp. 42-9; the capital types used to mark them are also discussed (cf. also *ibid.*, summary, 113f.).

³ Closer description and analysis: C. Ewert, *Islamische Funde in Balaguer und die Aljafería in Zaragoza* (Berlin, 1971), type G2.3 (finds BAL/S/3.01, 3.02), pp. 61, 193-5, figs. 38-40.

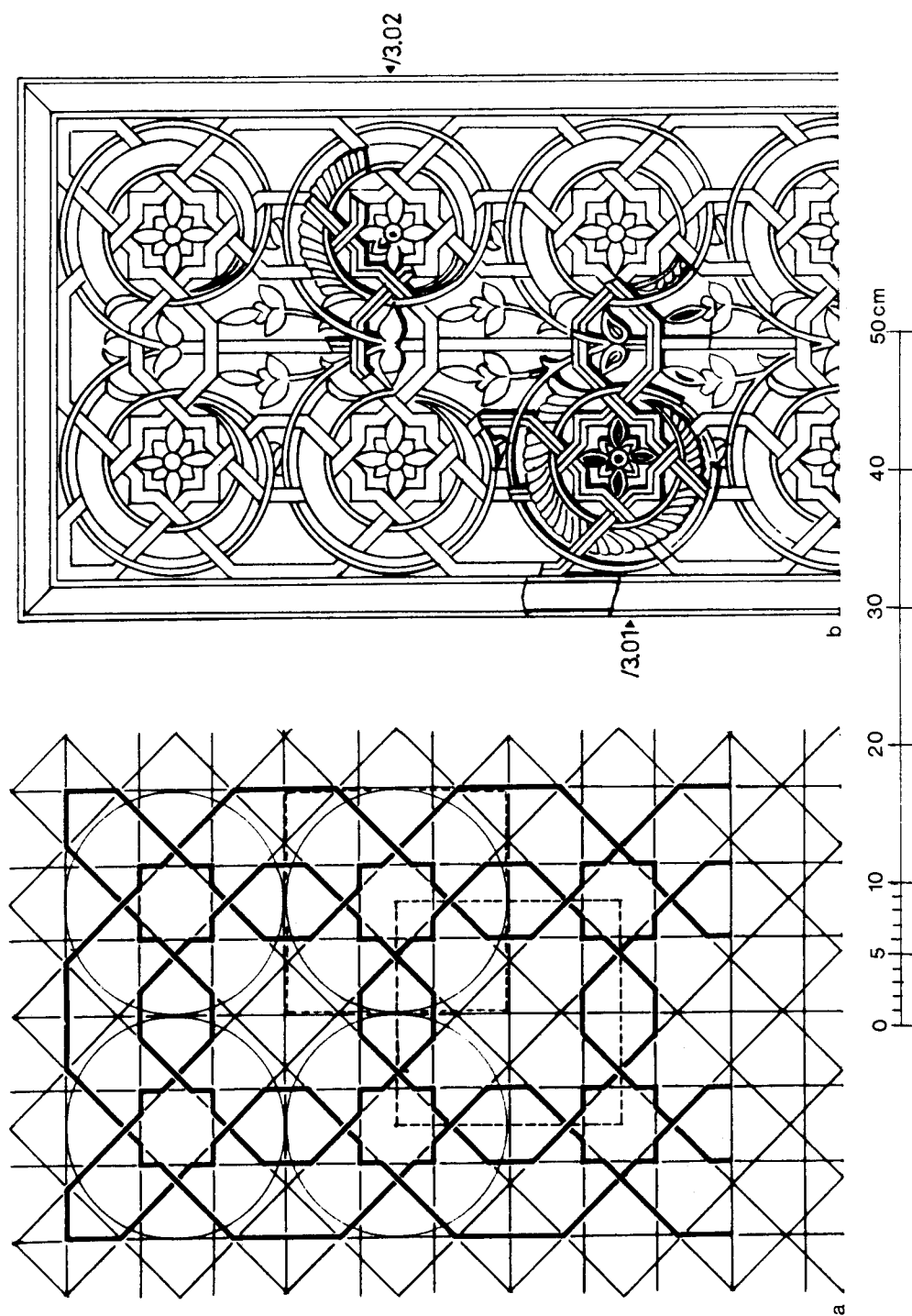


FIG. 16. Balaguer (Lérida Province), Alcazaba, reconstruction of Tā'ifa period stucco panel. *a*, geometric scheme, *b*, decoration, 1:5 (after C. Ewert, *Islamische Funde in Balaguer und die Aljaferia in Zaragoza* (1971), fig. 39).

whole. The spatial boundary of the qibla riwāq becomes the frame of the monumental decorative panel.¹

The familiar Islamic principle of overlaid decorative levels reveals itself here therefore in the encoded detailing of the oratory; an essential Islamic principle of decoration is realized by early Islam with pre-Islamic spoils.

Is there a superior inner meaning attached to this monumentalization of the large design on two levels?

The central motif of the theme of interlocked polygons rendered with supporting elements is formed by the two concentric octagons. (The compressed green hexagon of column shafts reflects the compromise with a second eccentric inner octagon, which for the sake of argument is left out of account in this short paper.)² We venture to postulate a representation of the most essential characteristic of the most important sanctuary created in early Islam, an isolated phenomenon in early Islamic monumental architecture: the double ring of columns in the Dome of the Rock (Fig. 17).³

At the time of the rebuilding of the Sīdī 'Uqba in Qairawān the 'Abbāsid caliph was paying particular attention to the Dome of the Rock. In 216/831, only five years before the traditional date for the first constituent Aghlabid phase, al-Ma'mūn had the name of the Umayyad patron eliminated and replaced by his own on the lintel inscriptions of the eastern and northern entrances, and probably at the same time on the monumental foundation inscription of the outer ambulatory arcade. The new date of 216/831 only appears in the inscriptions of the east and north entrances; it does not encroach on the original building date in the main inscription running round the ambulatory.⁴ The anachronism leaps to the eye; the historic attribution

¹ For the figures completing the central configuration of interlocking or intersecting polygons and for inclusion of the Aghlabid court façade into the geometric articulation scheme cf. Ew-Wi 1981, pp. 44-7.

² Cf. Ew-Wi 1981, p. 48.

³ More detailed argument: Ew-Wi 1981, pp. 49-52. For the possible inclusion of the second principal member of the Ḥarām ash-sharīf in Jerusalem, the al-Aqsā Mosque, into the 'copy' in Qairawān cf. Ew-Wi 1981, pp. 53, 114.

R. Krautheimer, 'Introduction to an "Iconography" of Mediaeval Architecture', *Journal of Warburg and Courtauld Institutes*, v (1942), 2 ff., has taught us that in the Middle Ages a copy did not mean a detailed repetition. From the example of the churches of the Holy Sepulchre (also central plan buildings!) he showed that the adoption of essential characteristics was sufficient.

⁴ For the mosaic inscription of the ambulatory arcade cf. especially M. van Berchem, 'Matériaux pour un Corpus Inscriptionum Arabicarum. Deuxième

to 'Abd al-Malik presents no difficulty, even after the erasure of his name. It can hardly, therefore, be understood as a deceptive forgery, nor as a *damnatio memoriae* of a hated predecessor—that might rather have been expected from the first 'Abbāsids—but more as a spiritual adoption of the monument.¹ Did the vassal residing in Ifrīqiya comprehend this process by including an encoded reference to the Dome of the Rock in his new building? Was he perhaps even following a suggestion of his sovereign? It is true that the Aghlabids behaved very independently politically, but the spiritual and religious links with the caliphate were never neglected. At the building of the Great Mosque of Tunis, the truest typological copy of the Sīdī 'Uqba, this dependent relationship is noticeably stressed, with the direct intervention of the caliph al-Musta'in suggested: the foundation inscription at the base of the dome fronting the mihrāb gives his name, while no Aghlabid name appears.² But the comparison with Tunis makes plain that there is a difference of rank. The az-Zaitūna appears to be a faithful copy of the Sīdī 'Uqba: in the T-scheme of the oratory spoils from the same provenance were used, but almost chaotically placed, apart from the central nave's monochrome red breschia shafts and symmetrically paired capitals.³ This provincial mosque was in fact not considered worthy enough to allude to the Ḥarām ash-sharīf of Jerusalem. That seems to have been reserved for the most prestigious mosque foundation of the Maghreb, the mosque of a city singled out as an important station on the route to the Islamic East and to its pilgrimage centres.

The little mosque at Bāb al-Mārdum in Toledo (Figs. 18–21, Pls. XXI–XXII) can be seen as the 'missing link' between Qairawān and Tinmal. It was built in 999–1000.⁴ I have already

partie: Syrie du Sud. Jerusalem', *Hqam*, ii (1925), 235ff.; cf. also Creswell, *EMA*², i. 1, 69, 72, with further bibliography; in recent literature cf. also O. Grabar, *Ars Orientalis*, iii (1959), 57. For the inscribed copper panels of the east and west entrances cf. especially van Berchem, op. cit., pp. 246ff.; the west and south entrances were presumably provided with similar inscriptions (van Berchem, op. cit., pp. 253–5).

¹ Van Berchem (op. cit., pp. 237, 251) stresses that no (Arab) author records any restoration works under al-Ma'mūn and one may wonder whether the inscription texts are not evidence of a 'prise de possession'. Cf. also Creswell, *EMA*², i. 1, 72 n. 1.

² For bibliography for this inscription cf. Ew–Wi 1981, n. 200.

³ Ew–Wi 1981, pp. 54–7, figs. 32–3.

⁴ For the foundation inscription cf. M. Ocaña Jiménez, 'La Inscripción fundacional de la mezquita de Bāb al-Mardūm en Toledo', *Al-Andalus*, xiv (1949), 175–83.

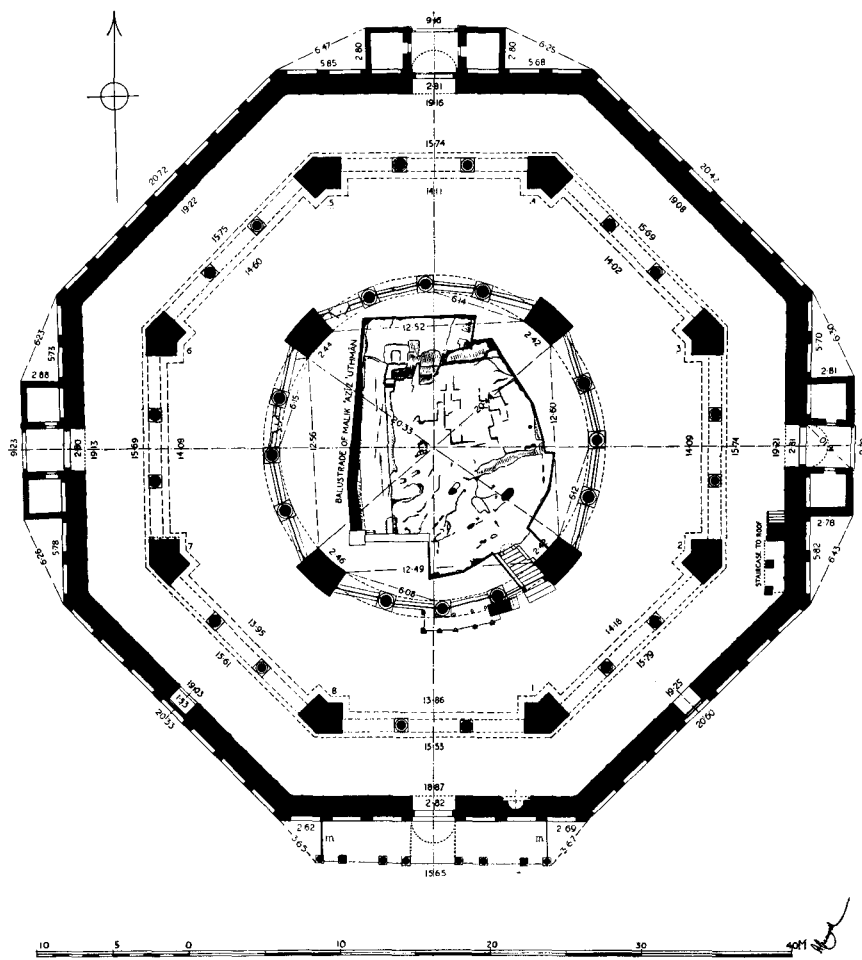


FIG. 17. Jerusalem, Dome of the Rock, ground plan, 1:500 (Creswell, *EMA*², i. 1, fig. 21).

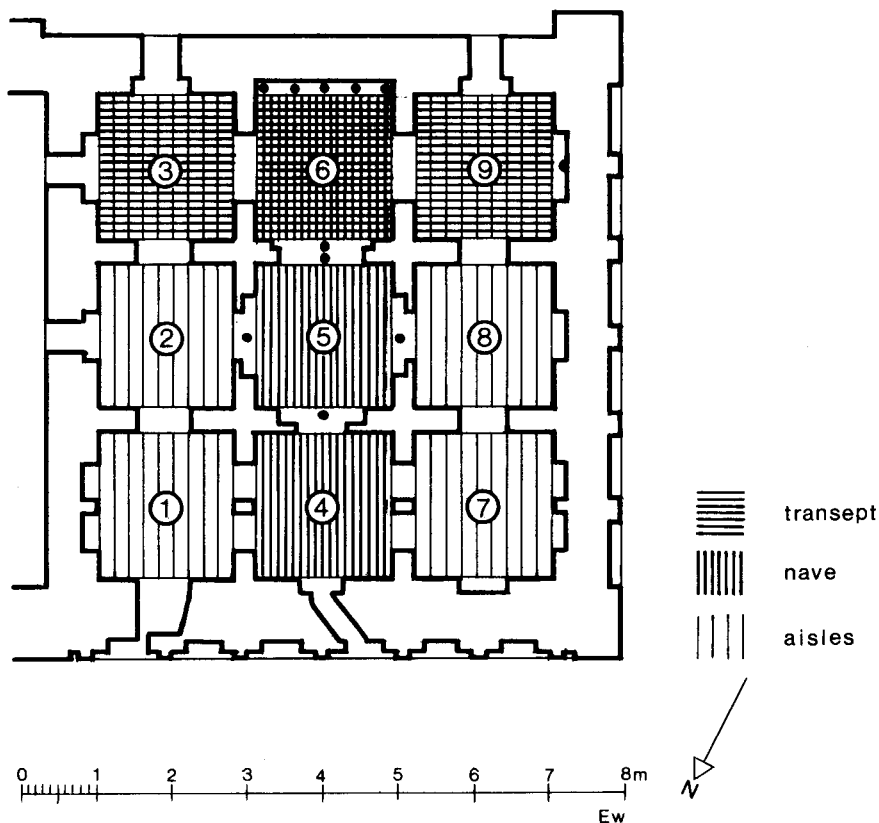


FIG. 18. Mosque at Bāb al-Mardūm (El Cristo de la Luz), Toledo, intermediary storey, alignment and interpenetration of 'aisles', 1:100 (C. Ewert, *Madriider Mitteilungen*, xviii (1977), fig. 1c).

analysed it in detail elsewhere as the 'copy' of the Great Mosque of Córdoba,¹ but I will now once more sum up how the ground plan of a T-scheme is realized in the nearly square grid of three by three compartments on two levels.

At the level of the vaults (Fig. 20, Pl. XXII)² the dome fronting the mihrāb (Pl. XXII: vault 6)³ plays an outstanding, special, role. The crossing of the two axes of the T-type, which in Córdoba is emphasized by mosaic decoration,⁴ is translated here plastically

¹ C. Ewert, 'Die Moschee am Bāb al-Mardūm in Toledo—eine "Kopie" der Moschee von Córdoba', *Madriider Mitteilungen*, xviii (1977), 287–354; cf. also Ew-Wi 1981, pp. 94–7.

² Ewert 1977, pp. 298–307, pls. 59–61.

³ Ibid., pp. 299–301, 303f., pl. 61c–d.

⁴ Cf. H. Stern, *Les Mosaïques de la grande mosquée de Cordoue* (Berlin, 1976), pp. 7f., pls. 62–3.

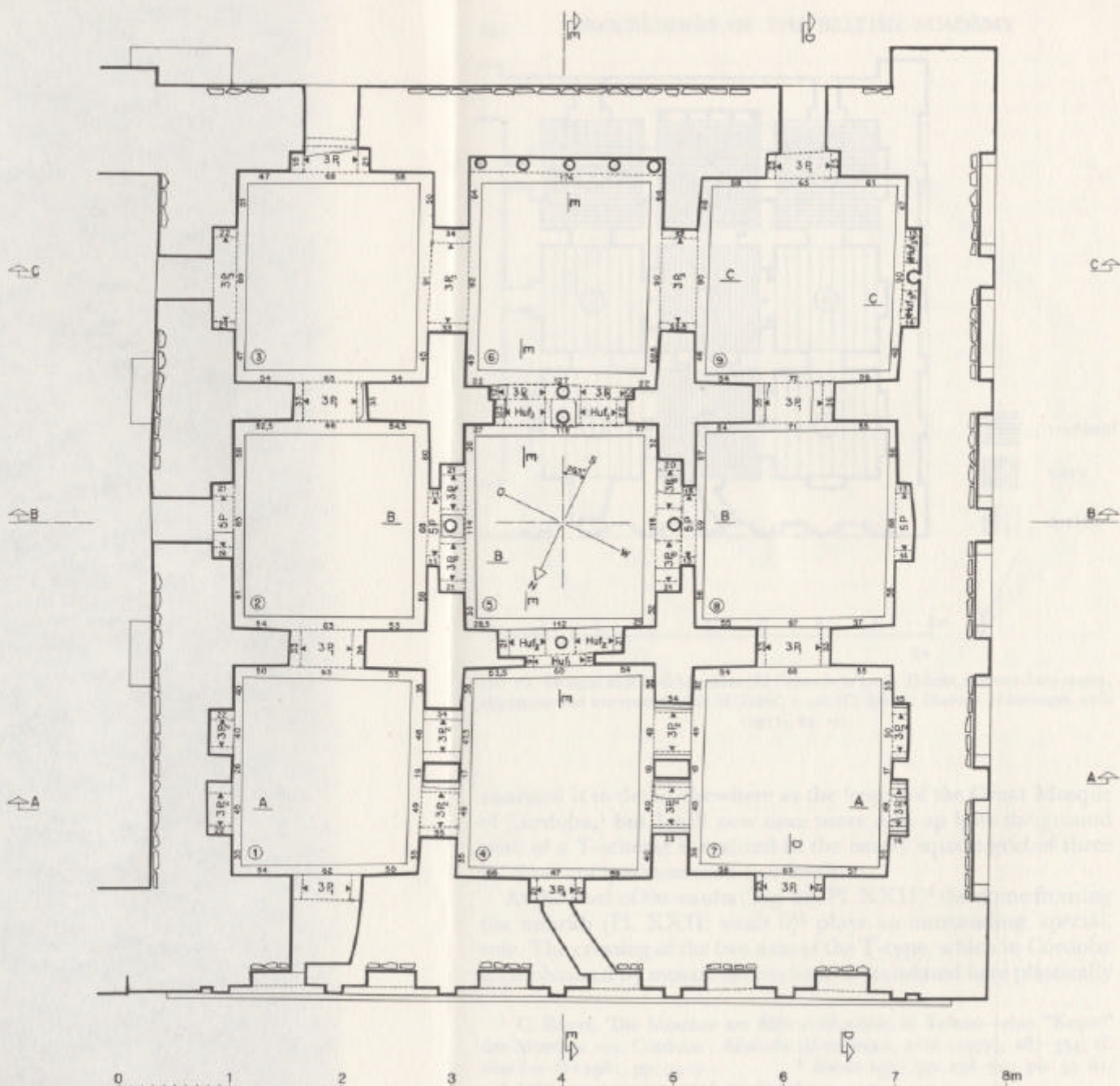


FIG. 19. Mosque at Báb al-Mardûm, Toledo, intermediary storey, plan with indication of types of arches (Huf = horseshoe; 3P = trefoil arch; 5P = 5-lobed arch), 1:50 (C. Ewert, *Madriider Mitteilungen*, xviii (1977), fig. 3).

into crossed ribs.¹ In the other eight compartments the reference is still to Cordoban models, but they are not left in their original positions but 'reshuffled', as R. Krautheimer² would say. The arms of the T are none the less visible. The Cordoban dome models are only reproduced literally, intact, in the compartments corresponding to them (Fig. 20 and Pl. XXII: vaults 3, 4, 5, 9).³ In the four remaining bays there are only fragmentary quotations: details or new combinations of the Cordoban models appear (Fig. 20 and Pl. XXII: vaults 1, 2, 7, 8).⁴

The methods of design on the 'upper horizon plans' of Qairawān and Toledo are thus similar. In both, the pattern schemes were not produced with newly designed elements: in Qairawān with pre-Islamic spoils, in Toledo with copies of earlier Islamic patterns used as set pieces, that is to say exactly like spoils. If one realizes that in Toledo the degree of fidelity of the copy to the model is a distinguishing feature, more parallels in the detail can be recognized: in the background, which must be kept neutral to set off the pattern, the chaotically placed standard spoil capitals of Qairawān correspond to the fragmentary quotation of the Cordoban vault models in Toledo.

In Toledo a short intermediary storey (Figs. 18-19, Pl. XXI)⁵ is inserted between the neutral grill of the horseshoe arches on the ground floor⁶ and the vaults (Fig. 21). Two alignments of identical narrow trefoil arches (Pl. XXIa) suggest side aisles; perpendicular to them a similar suite of markedly wider trefoil arches (Pl. XXIb) marks out the transept in front of the qibla. The T-type so familiar from Tinmal is suggested both in the

¹ Another feature distinguishes the dome fronting the mihrāb in Toledo: all the ribs of the system are three lobed arches. In all the other vaults and even in the central raised dome, plain unbroken horseshoe arches are used.

² I allude once more to his celebrated article 'Introduction to an "Iconography of Mediaeval Architecture"' (see p. 141, n. 3).

³ The scheme fronting the mihrāb in Córdoba (Ewert 1977 (p. 144, n. 1), pl. 73a) is moved to the beginning of the 'central nave' (vault 4); the scheme at the beginning of the Cordoban central nave (Ewert 1977, pl. 72a) is moved to the south-west end of the T-arm (vault 9). Only the scheme of the side maqṣūra vaults (Ewert 1977, pl. 74a) corresponds in its position to that at Córdoba (vault 3), and a second example becomes the central dome (vault 5).

⁴ Ewert 1977 (p. 144, n. 1), p. 302f. The densest pattern is executed in vault 1: the rib skeleton of the dome fronting the mihrāb in Córdoba, already used in the next dome, 4, penetrates the pair of crossed ribs of the vault at the beginning of the Cordoban extension of al-Ḥakam II, transformed as in vault 8 into a grid.

⁵ Ewert 1977 (p. 144, n. 1), pp. 290-7, pls. 56-8.

⁶ Ground plan: Ewert 1977 (p. 144, n. 1), fig. 2.

vaulting and at this horizon level. What is particularly picked out in Toledo, however, is not the transept but the central nave. A series of parallel, transverse arcades, strongly varied, leads from the north wall to the qibla and mihrāb: a trefoil-arched niche, a single horseshoe arch (Pl. XXIc), twice paired horseshoe arches (Pl. XXIc-d), a pair of trefoil arches, and, finally, at the qibla, a system of intercrossing arches right across the compartment (Fig. 21, Pl. XXIe). The *coulisse*-like grading of progressively wider and richer arches invites the gaze to linger in the 'central nave'. The delaying approach to the sublime is a primeval psychological device: the visitor is brought to the throne by a long path with ever new and varying spaces. This tradition was inherited by Islam from the palaces of the ancient East. We need only think of the palaces in Sāmarrā, and not only the major complexes but the Qaṣr al-ʿĀshiq. It is not surprising that this device found its way ultimately into the mosque, to heighten a sacred anticipation. In al-Ḥakam II's extension to the mosque of Córdoba Corinthian and composite pilaster capitals of distinctive strong classical character suggest a delaying articulation by compartments in the central nave. Toledo springs to mind: in Córdoba the pilasters again, as the distinguishing elements of the nave, are positioned only in the upper order of arcades,¹ above a forest of deliberately simple boss capitals in the whole ground level of the oratory. In the Almoravid phase of the al-Qarawiyyīn Mosque in Fez a whole series of distinctive ribbed and muqarnaṣ vaults is directed along the strongly compartmentalized central nave towards the mihrāb.² The little Toledan mosque provides the most extreme concentration of a psychological device of articulation used equally in palace and mosque architecture.

To resume, two principal conclusions should be emphasized from the investigation of 'alien factors' in the mosque ground plan:

- (1) Islam knows no strict separation of mosque from palace architecture. In two random surveys, in the interior and on the exterior of the Almohad mosque, the possibilities of the interchangeability of elements are clear, in the interior in the scheme of a three-sided ambulatory, on the exterior in the motif of the dominating salient erected on the main axis of the façade. A comparison between high Almo-

¹ Ew-Wi 1981, pp. 77-85, fig. 41, pls. 23-5.

² H. Terrasse, *La Mosquée al-Qarauiyyin à Fès* (Paris, 1968), figs. 12, 20, pls. 27-30, 32a, 33-7.

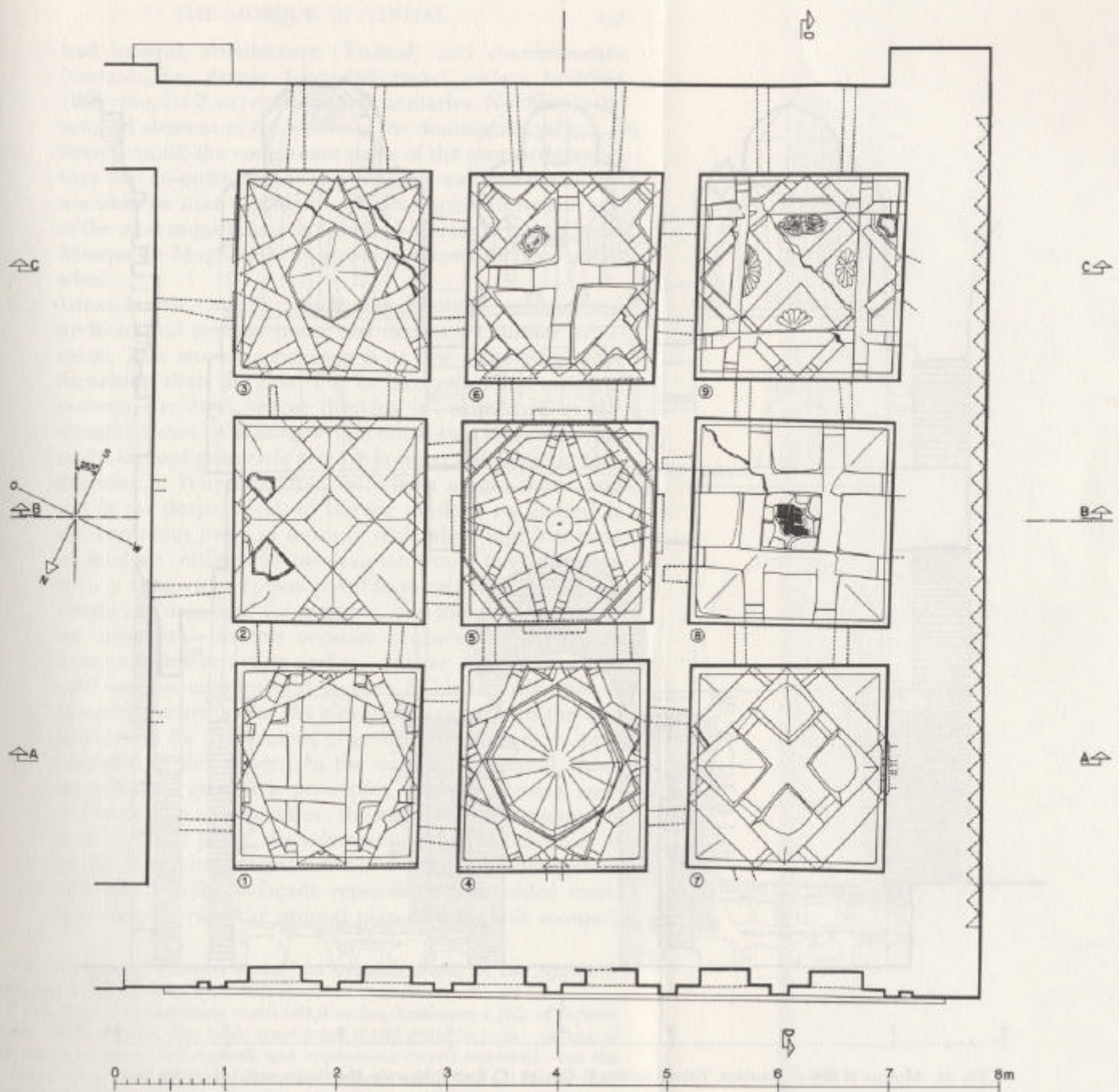


FIG. 20. Mosque at Bāb al-Mardūm, Toledo, vaults, plan, 1:50 (C. Ewert, *Madrider Mitteilungen*, xviii (1977), fig. 4).

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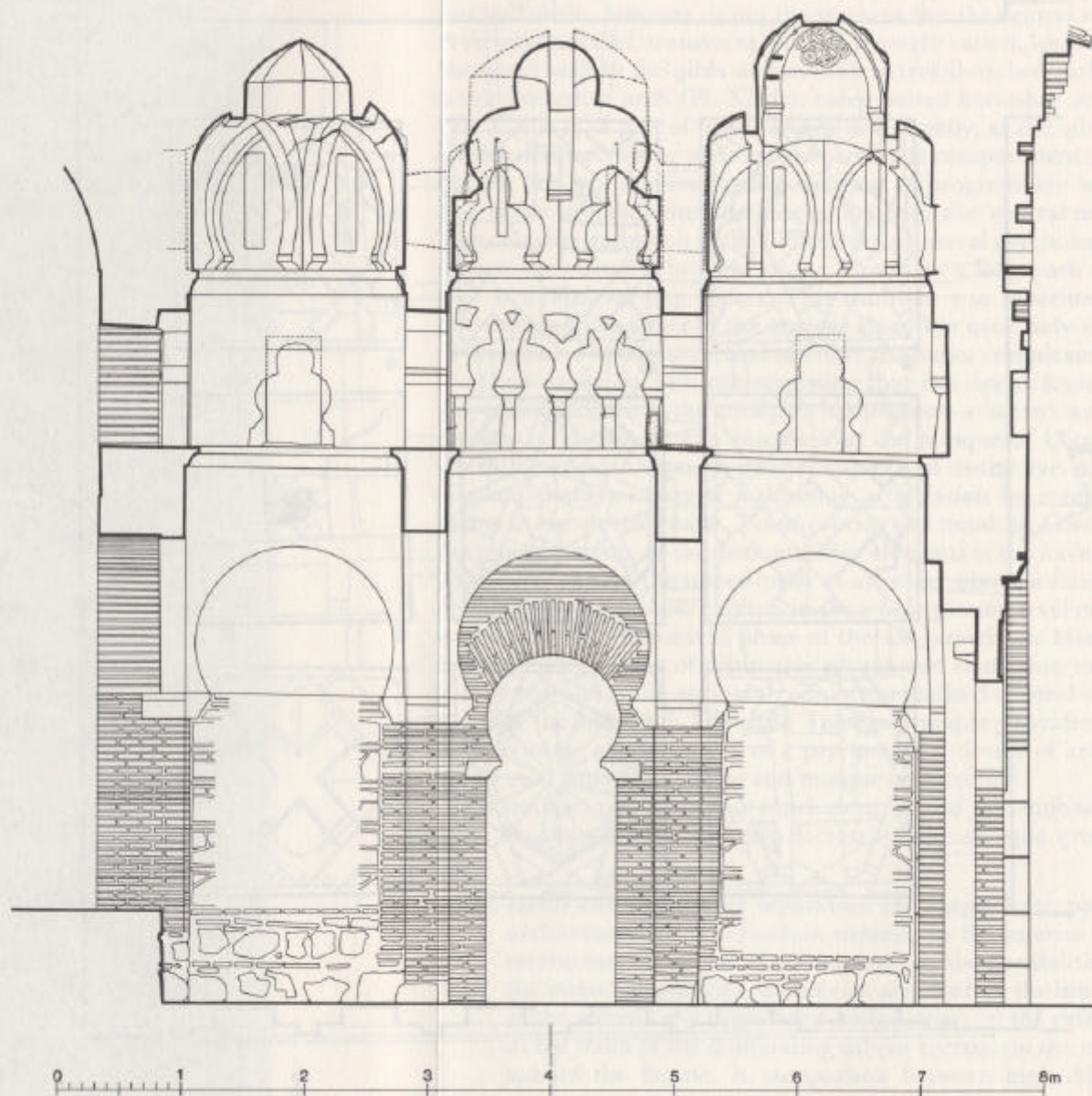


FIG. 21. Mosque at Bāb al-Mardūm, Toledo, section C-C, 1:50 (C. Ewert, *Madrider Mitteilungen*, xviii (1977), fig. 7).

[Facing p. 147

had mosque architecture (Tinmal) and contemporary Norman, i.e. deeply Islam-influenced, palace building (Palermo, La Zisa) showed their similarity. Not only is the isolated element of the exterior, the dominating salient, a shared motif; the constituent parts of the geometric structure that co-ordinates the surrounding wall and the salient are likewise shared. Finally, we ventured to interpret one of the most important late Almohad sanctuaries, the Qaṣba Mosque in Marrakesh, as a palace scheme sacrally intensified.

- (2) Islam knows no strict separation between monumental architectural ground plans and decorative surface ornament. This second conclusion is at first sight even more surprising than the first, but in fact only for a modern, western, architect, whose thinking is hemmed in by the straight-jacket of a narrow functionalism. Refined, often multi-layered geometric nets are familiar in Islamic surface decoration. Why have they only been sought there, and not in the deeper levels of Islamic thinking on design? Is the enormous jump in terms of scale alarming? Yet even an analysis confined to the elevation would have dispelled such a misgiving. It was possible to establish in the Aljafería in Zaragoza,¹ for example, that identical geometrical schemata—on this occasion realized, as a rule, as systems of intercrossing arches—appear equally on capitals² and on monumental façades. (This investigation of geometric schemata of the elevation was perhaps the first inspiration for the analysis of ground plan schemata propounded in this paper.) In the mosque of Tinmal, then, the self-same geometric principles, indeed schemata, control both plan and elevation; the surface decoration proves to be the final phase, directly readable by the beholder, of an all-embracing process. Thus in Tinmal the monumental alfiz of the mihrāb façade repeats the three-sided motif that characterizes the ground plan of the whole mosque.

¹ Ewert, *Spanisch-islamische Systeme sich kreuzender Bögen*, iii, *Die Aljafería in Zaragoza*, 2 vols. (Berlin, 1978–80).

² A system of intercrossing multi-lobed arches dominates a pair of capitals in the north portico. The basic conception is still quite tectonic—on one of the pieces columns with capitals and imposts are clearly rendered—but the structure turns into plant (pinnate leaf arches) motifs (cf. C. Ewert, 'Der Mihrāb der Hauptmoschee von Almería', *Madriider Mitteilungen*, xiii (1972), 321 f., pl. 60). Cf. also Ewert 1978–80, ii, cat. no. 437, pp. 200, 259, pl. 79.

Whereas a connection between the scheme of the ground plan and decorative forms is first revealed in Tinmal in the elevation, in the Aghlabid Great Mosque of Qairawān the detailed articulation of the ground plan as a two-tier geometric net, contrasted, as a 'central plan', with the longitudinal primary scheme, which already fits into the frame of the outer wall of the oratory. Even in its detailed forms it invites comparison with decorative panels. Not only the monumental scale but the means of realization are surprising too: pre-Islamic spoils. The much later little mosque at Bāb al-Mardūm in Toledo shows that the Great Mosque in Qairawān is no hypertrophied exception in a still questing early phase, but an early maturity. At the level of the vaults in Toledo a treatment of the constituent elements of the ground plan is still almost a use of spoils in the manner derived from Qairawān. In its intermediary storey the new device of arch hierarchy is adopted, a device that later finds its most mature expression in Tinmal.

Mosque and palace, ground plan and surface decoration are fused together. Religion pervades all spheres of life, and can assimilate elements of an ostensibly purely worldly character. Architecture is one more witness to the Islamic attitude of mind which is always pressing towards the unification of all manifestations of human thought.