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A generation hence it may be possible to estimate with some confidence the legacy of the Islamic world to architecture; but in the present state of scholarship so much doubt exists as to several important aspects of Muhammadan architecture that only a violent partisan can feel sure of his ground. It is unfortunate that much recent research, which should have thrown light on uncertain points, has been presented to us in the form of polemical arguments. These are not mainly concerned with the nature of Muslim architecture in its mature periods, still less with its effect on the evolution of architecture in our Western world, but rather with its origins and its earlier buildings. Nevertheless, they have a direct bearing on the question of its legacy to mankind, for we cannot fairly recognize a bequest from Islam unless there is some proof that Islam possessed the original title. In other words, so many things in Muhammadan architecture are said to have been stolen from non-Islamic peoples that some scholars actually hold that the Muslims were mere borrowers of the architectonic forms and had no architecture of their own worth the name. To reach a conclusion on this fundamental point, it is necessary in the first instance to attempt a brief outline of the origins and nature of Muhammadan architecture in general.

The Arabs, who within a half-century swept like a desert whirlwind from the Hijaz to the Pillars of Hercules in the West and to the confines of India in the East, conquered countries already civilized. Their dominions extended over an area wider than that of the Roman Empire at its greatest extent, and embraced many nations whose architecture differed from that of Rome and in some cases was far older.

Whatever position one may assume in the bitter controversy between those who believe in the mainly Roman origin of our Western medieval architecture, and those who attribute every-
There is no need to dispute the view commonly and justifiably held that the first Arab conquerors had no architectural skill or taste. In the nature of things it must have been so. Such a conquest was only possible to a race of soldiers inspired by religious enthusiasm, whose time was necessarily occupied mainly in fighting and praying. Moreover, they were not a town-dwelling people but nomads; and even when they forsake fighting to take up the task of government, they inevitably relied for technical skill in the building arts on craftsmen they found on the spot, or (and this is important) on craftsmen brought from one conquered country to another. Thus it is known that Armenian masons were employed not only in Egypt but in Spain, and perhaps at the ninth-century church of Germigny-des-Prés in France, which has several Muhammadan features. But in spite of the Arabs' probable ignorance of architecture in the early years of conquest, the remarkable and incontrovertible fact about Muslim architecture is that in all countries and in all centuries it retained an unmistakable individuality of its own, although its origins were so diverse. There was something about it that differentiated it from the work of all the local schools of craftsmanship which were technically instrumental in bringing it into being.

The factor that transmuted and welded a host of varying modes of building into one style possessing individual characteristics was presumably the faith of Islam; for the buildings erected by the Arabs in their early years were chiefly mosques and palaces, and most of the important architectural works of subsequent centuries continued to be mosques or other religious buildings, such as madrasahs and convents, containing mosques. The mosque was the typical and principal Arab building, varying to some extent in form with different localities, but always retaining its main features. The annual pilgrimage to Mecca from all parts of the Islamic world doubtless contributed to the standardization of the mosque form, for in each town that the pilgrim passed

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through on his long journey he would make his prayers in the local mosque, and if he happened to be a building craftsman or an architect he would notice its design.

The primitive mosque at Madinah, built by Mu'ammad in 622, was the prototype of all others. It was a square enclosure surrounded by walls of brick and stone. Some part of it, probably the north portion where the Prophet led the prayers, was roofed. The roofs were probably made of palm-branches covered with mud and resting on palm-trunks. The congregation knelt facing north, the direction of the holy city of Jerusalem, and this direction (qiblah) was marked in some way. In 624 the direction for prayer was changed from Jerusalem to Mecca; that is (in the case of Madinah) from north to south. In so elementary a building, there was no need to borrow architectural features from anywhere, for no architectural features were required.

The next mosque, built at Kufah in Mesopotamia in 639, had its roof carried on marble columns brought from a former palace of the Persian kings at Hitah, and was also square, but was enclosed by a trench instead of by a wall. A smaller mosque was founded by 'Amr at Fustat (Cairo) in 642. It was square in plan, is said to have had no open court (sahn), and contained a new feature, a high pulpit (minbar). A few years later a masgufah (screen or grille of wood) was introduced to protect the imam from the crowd. Minarets are said to have appeared about the end of the century, and the misrab or prayer- niche (indicating the qiblah) a little later (Fig. 74). Thus, within eighty or ninety years from the building of the first mosque at Madinah, all the essential features of the congregational mosque (jami') had been evolved. Minor additions were liwanis (plural of liwan, a corruption of al-tawân), which were colonnades or arcades surrounding the sahn to give shelter, and facilities for ablution. This short list includes all the chief ritual requirements of the mosque in all periods.

None of the buildings mentioned retains its original structure
and even their plans have been lost in successive alterations. But
the plan is all that matters, for the primitive mosque was barely
a building and certainly not a work of architecture as we un-
derstand it. Nevertheless, M. van Berchem has suggested the
ascription of the origin of even this rudimentary mosque-plan
to that of the early Christian church; the ḥabn being derived
from the atrium, the principal ḥatām from the church proper,
the maqṣārāb from the chancel-screen, the minaret from the
church-tower, and the mihrāb from the apse. But such con-
jecture seems hardly necessary or appropriate: it is not until
the Arabs begin to translate this religious enclosure and shelter
into architecture that the question of origins arises.

The transition from bare necessity to attempts at dignity and
splendour was very rapid—surprisingly so when one considers the
austerity of the Islamic cult and the severity of the campaigning
life led by so many of its votaries. Within twenty years of
Muḥammad's death, his own mosque at Madinah was rebuilt
with walls and piers of dressed stone. And in the last years of
the seventh century was built, near the rude mosque erected by the
Caliph Omar at Jerusalem, after the Arab conquest of that city
in 639, the magnificent 'Dome of the Rock', as it is commonly
called, a building of impressive size and monumental character,
gorgeously decorated (Fig. 75). At this point we plunge into
the heart of all the acute controversy that still rages about
the origin of Muslim architecture. The Dome of the Rock
(Qubbat al-Ṣakhrah in Arabic) was an elaborate stone building,
strictly speaking a masjid ('place of witness') where pilgrims
circumambulated the Rock, the spot whence Muḥammad was
believed to have ascended to Heaven. Moreover, it remained
unique; and for four centuries at least there was no important
attempt at departure from the normal square congregational
mosque with its open court. It has therefore been assumed, far too

1 Encyclopaedia of Islam: article 'Architecture'.
2 This theory is now discounted.
rashly, that the Dome of the Rock is simply a Roman or Byzantine type of structure, copied direct from pagan or Christian prototypes, executed by Christian craftsmen throughout, and therefore an alien work of architecture standing right outside the main stream of Arab art. There is a measure of truth, and more plausibility, in this view, but it must not be pressed too far.

In evolving this new type of building, an aisled rotunda, the Arabs had a definite purpose in mind. They wished to glorify and shelter the Sacred Rock of Jerusalem, already an ancient object of devotion to Muslims as well as Jews; and they desired to erect a building which should rival and surpass the famous Christian church of the Holy Sepulchre near by. The new masjid was placed in the middle of a spacious rock plateau, known as the Haram al-Sharif, or 'Holy Sanctuary', on a great terrace or podium. (Aligned with it on the central axis of the plan already stood a mosque, that known as al-Aqsa. A primitive building, its history is too obscure and complicated for discussion here.) In adopting the dome, or more precisely the 'annular rotunda', for the distinctive feature of their shrine, the Arabs showed sound judgement; and it is true that the dome had been used in this way, as the culminating and controlling element of a building designed to shelter a tomb or other venerated place, by both Romans and Byzantines before them. But these were not the only dome-builders on earth; and Strzygowski, the protagonist of Iranian inspiration, argues that the Eastern dome originated in Asia Minor or farther east, passed through Armenia to Byzantium, and thence to the Balkans and Russia under the patronage of the Greek Church. Thus, though the Arabs here used a dome for the first time, they were adopting a feature which was not exclusively Christian or even exclusively Roman, and was probably copied from the famous 'Anastasis' dome, adjoining it and of almost identical size. Certainly there were domed churches in Syria and Armenia.

1 J. Strzygowski, op. cit., p. 27.
long before the end of the seventh century; and churches of
the type of the Dome of the Rock, that is, a rotunda within
an octagon, already existed in Palestine. For the rest, the walls
are of solid stone, the arches of the internal arcade and of
the window-openings are semicircular, and the whole of the
columns used in the two arcades are antiques, taken from
older buildings, pagan or Christian. Hence neither the shafts
nor the capitals of these columns are uniform in style. Across
the springing of the arches are massive timber ties, probably
introduced to resist the shocks of earthquakes prevalent in
the locality, or perhaps because the builders were nervous of
the safety of trusting the arch alone; similar precautions are to be found
in Byzantine buildings. The dome itself is double and con-
structed entirely of timber, covered externally with lead and
internally with modelled and painted plaster, but it is not the
original structure. Much of the mosaic work is original, but
most of the remaining decorations are of later date. Hence we
find that, at the Dome of the Rock, the innovations are the
domical plan, the use of semicircular arches, timber ties, and
perhaps mosaic. The semicircular arch was undoubtedly an
Arab invention, the origin of timber ties is doubtful, and the
earliest use of mosaic is pre-Islamic.

After the Dome of the Rock, the next important Muslim
building in chronological order is the Great Mosque at Damascus,
erected in the first years of the eighth century (Fig. 76). The
principal ḥākem or sanctuary is a lofty apartment with doors or
screens in the arches separating it from the ḥab. Arcaded por-
ticoes also surround the remaining three sides of the ḥab. The
new features in this mosque are numerous. The principal ḥākem
has three aisles, crossed by a central transept, over the middle of
which is a dome. At the end of the transept, that is, in the centre
of the south wall of the principal ḥākem, is a prayer-niche
(mibrāb) indicating the qiblah or direction of Mecca. The arches
surrounding the central court are carried partly on piers and
partly on columns, and the arches are of the 'horseshoe' form which was destined to become characteristic of Western Muslim architecture, for some not very apparent reason. A horseshoe may be round or pointed at the top, but in either case its curve is carried down below the 'springing line'. At Damascus the round horseshoe arch is used. Above the main arcade, all round the fabn, is a range of semicircular-headed windows, two to each arch. Of the four Roman towers that once stood at the angles of the temenos within which the mosque was built, and which were used by the Arabs as minarets, only one (at the south-west angle) now remains, the other minarets being later in date. The interior of the building was richly decorated with marbles, mosaics, and apparently windows of coloured glass. The unusual plan of this mosque may have been influenced by the arrangement of Syrian churches converted into mosques, and the introduction of a transept and dome in the middle of the sanctuary may be evidence of a desire to enhance the importance of the qiblah, now represented for the third time by a mihrab. The mihrab itself may have been an original idea; in a part of the world where diseases of the eyes are very common, it may even be possible, as an old shaykh once told me, that the mihrab was made in the form of a niche so that a blind man could recognize it as he groped his way round the walls, or it may have been borrowed from the Christian apse. The horseshoe arch has been found in pre-Islamic buildings, carved in the rock, but its occurrence at Damascus is one of the earliest cases where it has a true structural function. The purpose of the minaret is clear enough: it was provided to give a position of vantage to the mu’adhdhin who summoned the faithful to prayer—a call invented perhaps intentionally as a contrast to the Christian custom of summoning worshippers with a clapper (before bells were introduced), or the Jewish use

1 The first niche-mihrab was at Madinah, the second at Fustaq (Cairo).
2 The Arabic word for minaret (ma’dhab) signifies the place whence the call to prayer (adhan) is made; and the mu’adhdhin is the man who makes the call.
of a horn. The first instance of a tower being utilized for this purpose seems to have been at Damascus.

The earliest surviving minaret is that of the Great Mosque at Qayrawân near Tunis, and is recorded to have been built during the caliphate of Hishâm (724-43). It is a huge and massive square tower, tapering slightly upwards, crowned with battlements, and surmounted by two stages, one built at a later date. Even if it is true that the four square towers at Damascus were the first minarets adapted to that end, it does not seem that a perfectly plain structure, such as that at Qayrawân, need be ascribed to Syria or any other special place of origin. It is an instance of ritual requirement met in the simplest and most straightforward way. Otherwise, the mosque at Qayrawân is of the congregational type, frequently altered, but retaining in the main the form in which it was rebuilt at the end of the ninth century. The mosque of Zaytûnâ at Tunis, founded in 732, is another early and interesting example of the congregational type, with arcades formed of unpleasantly stilted arches supported on antique columns. Over the capitals of the arches are wooden blocks or abaci, connected by wooden tie-beams. This device mars the effect of many early Muslim buildings.

The Great Mosque at Córdoba in Spain, begun in 786, continues the succession (Fig. 77). Its area was more than doubled in the tenth century, but its original form may still be recalled by a careful study of the existing structure. It was a congregational mosque with a very deep sanctuary, containing eleven aisles separated by arcades, each with twenty columns. These columns, as in other cases already mentioned, were taken from older Roman buildings. The enormous size of the sanctuary made it desirable to have a proportionately lofty ceiling, much more lofty in fact than the height of the available columns with ordinary horseshoe arches above them. So a second range of arches was built at a higher level, creating a complicated and restless effect that is far from pleasing. Thus we find that the use of ready-
made antique columns dictated the whole design of the arcade, both at Qayrawān and Córdoba, whereas the introduction of brick or stone piers, or of taller columns specially made for the building, would have enabled the architect to dispense with such regrettable subterfuges. The whole of the mosque at Córdoba was surrounded by a high buttressed wall, and there were arcades all round the ābān.

We must now retrace our steps to Mesopotamia, where a series of mosques built in the brick style traditional to that country connects the prototype at Madinah with the famous mosque of Ibn Ṭūlūn at Cairo. Of these intermediate examples the most noteworthy are at Ukhaizdīr, Raqqah, Abū Dulaf, and Sāmarrā. The first two of these are ascribed to the late eighth century, and the other two are of the mid-ninth century. They all carry on the tradition of Sasanian architecture and all have the ‘congregational’ plan. The mosque at Ukhaizdīr, so admirably described in the late Gertrude Bell’s monograph, is of vital interest to us because one finds there in embryo the pointed arch which afterwards became the distinctive feature of Western Gothic architecture. The characteristic Sasanian arch is semicircular, but occasionally one meets with isolated early examples of pointed arches. Horseshoe arches were probably used in Mesopotamia before this; there are several in Syrian churches (e.g. in the church of Qaṣr ibn-Wardān, c. 564), and actually a Hellenistic example at Chiusi in Italy. At Ukhaizdīr the arches are pointed ovoid and slightly stilted, as at Mshatta. But in the Bagdad Gate at Raqqah and at Abū Dulaf near Sāmarrā the arch had assumed the curve typical of later Muslim architecture, and by the end of the eighth century it was replacing all other arch-forms in Mesopotamia. The much earlier pointed arches found occasionally in India are cut out of solid rock, so are not really arches at all.

The Great Mosque at Sāmarrā is of enormous size and of con-

1 G. L. Bell, Palaces and Mosque at Ukhaizdīr (Oxford, 1914).
Fig. 78. PARALLEL OF CUSPED ARCHES (not to scale)

A. Sāmarrā, Great Mosque (846–52).
B. Córdoba, Sanctuary of Great Mosque (961–76).
C. Church of La Soutraine, France (c. 1250).
D. Cleay Church, Norfolk (XIVth century).
siderable historical interest. It consists of a ṣabn with a deep sanctuary on the Mecca side and fairly deep porticoes round the remaining sides of the ṣabn. The great brick enclosing-wall has circular towers at each angle and semicircular towers intermediately. In the south wall of the sanctuary there is a row of small window-openings with cusped or multifoil heads. This remarkable feature, also found at Córdoba, may have originated in Buddhist India as Havell¹ suggests; otherwise it must be credited, with all its implications in Western art, to the Muslims (Fig. 78). Still more important is the substitution of brick piers to carry the arcades, in place of the antique columns used at Córdoba and elsewhere. These piers are octagonal in form on a square base, and have four circular or octagonal marble shafts to each pier. The shafts were jointed with metal dowels and had bell-shaped capitals. Here we have another feature that passed into Western architecture. The curious spiral minarets used at Sámara, and later at the mosque of Ibn Ṭūlūn, led to no subsequent advance.

The mosque of Ibn Ṭūlūn at Cairo, commenced in 876, has been described at great length and by many writers,² but its importance in the history of Muhammadan architecture has been diminished to some extent since we have realized that some of its most distinctive features were anticipated in rather older buildings in Mesopotamia. It is a large congregational mosque, nearly square in plan, with a ṣabn surrounded on all sides by arcaded porticoes (Fig. 79), the sanctuary ḥawān being much deeper than the others. Outside the main walls is an open enclosing court (ziyāda), a feature that we have not met with before. The external walls are very massive and are crowned with ornamental battlements which, as will appear later, may be regarded as the prototype of Gothic pierced and crested parapets. (Battlements of various types were used in Assyria as early as the eighth

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century B.C., in Egypt earlier still.) Below the battlements is a row of pointed window-openings filled with pierced plaster screens or claire-voiés, alternating with pointed niches with multifoil or cusped heads. The arcades consist of massive brick piers with brick-engaged shafts at the angles, and above them are pointed arches which have a just perceptible 'horseshoe' curve at the springing. Thus the whole structure up to the level of the timber roof is of brick, covered with plain or ornamental stucco. It may be said without exaggeration that this mosque is, in all respects, Mesopotamian in type, and is derived from examples at Sámarra and Baghdád with which its founder, Ibn Tulún, had been familiar in youth. Besides the features already mentioned, other innovations include carved Kufic inscriptions in wood (a very skilful adaptation of lettering to ornamental purpose), and decoration in colour on practically all visible surfaces, mainly on white stucco, but also on the timber beams of the ceiling. There is a mihráb niche of bold design, since altered; a central fountain (fauwáráb, not the original structure which had a wooden dome) in the sáhn; and gorgeous lamps hung from the roof.

From the end of the ninth century to the end of the twelfth the number of surviving Muhammadan mosques is not large. Much military architecture was produced during that period, and it is admitted that the Crusaders gleaned ideas from the fortresses of Syria and Egypt, for masonry in Syria and Armenia had reached a high level centuries before this. The European use of machicolation,¹ for example, came from this source.

¹ Machicolation: an arrangement of bold brackets or corbels, closely spaced, carrying a projecting parapet. Between each pair of brackets is an opening (French machicoulis), closed with a trap-door, through which arrows, boiling oil or water, and other unpleasant things could be dropped on to the heads of besiegers attempting to mine the bottom of the walls below. Machicolation superseded wooden galleries, known as Bouvards (hoardings) or Bretèches (brattice) and used for the same purpose.
In an appendix to his work on the citadel of Cairo, Mr. K. A. C. Creswell examined the origins of machicolation. He pointed out that six or seven of the ten alleged early examples in Syria were in fact small projecting stone latrines of a type that was common up to recent times; indeed there is one such, still in use, on the pier at Gorey in Jersey. Of the three remaining examples, which may have been used for the delivery of missiles from a height, the earliest dates from the middle of the sixth century A.D., that is, before the foundation of Islam. Since Mr. Creswell cited these instances, a Muslim example has been discovered at Qaṣr al-Hair near Rusafa in Syria, dating from A.D. 729. There are two over the Bāb an-Naṣr (1087), a gateway at Cairo built by Armenian masons, and these were evidently machicolites placed to cover the approach (Fig. 80). They antedate by a century the first instances known in Europe, viz. at Château Gaillard (1184), Châtillon (1186), Norwich (1187), and Winchester (1193). It is therefore clear that the Crusaders borrowed the idea from the Saracens, and not vice versa. Machicolation on rows of corbels eventually became very elaborate in French and English castles of the fourteenth century (Fig. 81).

Another feature of military architecture borrowed from Egypt and Syria was the 'right-angled' or 'crooked' entrance to a fortress through a gateway in the walls, by means of which an enemy who had attained the gateway was prevented from seeing or shooting through it into the inner courtyard. An entrance of this type does not seem to have been known to Roman or Byzantine military science, in which successive defensive gates were placed on the same axis, separated by a space known as the propugnaculum. These crooked entrances were first used, so far as is known, in the 'Round City' of Baghdad (eighth century), again at Saladin’s citadel at Cairo (begun 1176), and culminated in a fine example at the citadel of Aleppo. They are seldom

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1 In Bulletin de l'Institut français d'archéologie orientale, vol. xxiii (Cairo, 1924).
found in England, though there is a good example at Beaumaris; in France they were more popular, e.g. at Carcassonne. But both these countries favoured an oblique entrance for the more elaborately fortified castles, e.g. Pierrefonds and Conway.

India has no Muslim buildings of importance prior to the work at Old Delhi at the beginning of the thirteenth century. Nor is there anything in Asiatic Turkey, where the series of Seljuk buildings at Konia begins about the same time. In Spain and North Africa the chief remains, apart from military architecture, are the later work in the Great Mosque at Córdoba, where considerable extensions took place in the second half of the tenth century, and the fine minarets at Seville (the ‘Giralda’ tower, 1172–95) and at Rabat (1178–84), both of which are decorated with cusped arcading resembling and anticipating later Gothic tracery (Fig. 82). This work is very interesting in character, and includes some remarkable dome-construction, but had no marked effect on architectural development outside Spain itself. In Sicily the Cappella Palatina was built in 1132, the church of the Martorana in 1136, La Ziza in 1144, and La Cuba in 1180. These are the accepted dates, and all of them fall outside the limit of Muslim domination in the island, which ended in 1066 for Palermo and in 1099 for Sicily as a whole. But even if they were built by the Normans they abound in pure Saracen features which are also found on the mainland of Italy at Amalfi and Salerno. In Persia the chief buildings of this period are the ‘Friday Mosque’ at Isphahan and the Great Mosque (c. 1145–91) at Mosul, both large congregational mosques, but the former has been much altered. The Persian mosques, being constructed of brick, were decorated with stucco reliefs and with enamelled tiles, the latter a fashion afterwards adopted even in countries where stone was used, such as Syria and Egypt. The minarets were generally placed in pairs, were cylindrical in form, tapering slightly upwards, and were covered with glazed coloured tiles. M. Saladin has rather unkindly likened them to
factory chimneys, and certainly they do not compare in gracefulness with the Cairene minarets. Persia also enthusiastically welcomed the curious 'stalactite' ornament described in the next paragraph.

The principal examples of the 'Syro-Egyptian' school are all to be found in Cairo, and are the large congregational mosques of al-Azhar (970) and al-Ḥākim (990–1012), the small congregational mosque of al-Aqmar (1125), and the small but important tomb-mosque of al-Juyūshī (1085). At al-Azhar and al-Aqmar the arcades are carried on antique columns, at al-Ḥākim on brick piers. At al-Ḥākim stone was used for the first time in Saracen Cairo, though the Muṣṭāfam hills adjoining it furnish an excellent limestone. Evidently Cairo had leaned heavily on Mesopotamian tradition hitherto. The mosque of al-Juyūshī is the first example of a tomb-mosque, a type afterwards developed to great elaboration, with a dome over the founder's tomb and the mihrāb on its south wall. The ḥabīn is small, and between it and the dome is a vaulted transept. There is a square minaret in three stages, capped with a small high dome such as one sees on the Sicilian churches. The evolution of the dome is of the highest importance in the history of Muslim architecture, but, as it has no apparent bearing on Islam's legacy to Western building, it must be ignored in this brief survey. For the same reason, there is no object in discussing the origin of that unique feature the 'stalactite', which followed the Muslims everywhere and became a hallmark of their architecture from India to Spain. Possibly of Mesopotamian parentage, its first authenticated occurrence is on the minaret of the mosque of al-Juyūshī; the next on the façade of the mosque of al-Aqmar, where it is used decoratively, and where there are also niches carved in the semblance of a scallop-shell; surely the prototype of the familiar Renaissance shell-niche? A band of ornamental Kufic lettering runs along the top of the façade. Another detail occurring in Cairene
mosques of this period is the ‘saw-tooth’ battlement, again probably derived from Mesopotamia. This motif may conceivably have inspired the architects of the ducal and other palaces at Venice.

From the thirteenth century onwards we have ample remains of Muslim architecture in all its provinces; India and Turkey have to be added to the list and Sicily struck off. Spain possesses the important palaces known as the Alhambra and the Alcázar, noteworthy for their profuse but graceful decoration; otherwise her later Moorish buildings are not of the first rank. Cairo furnishes the finest sequence of mosques and tombs up to 1517, when the city was captured by the Turks, and thereafter followed Ottoman fashions in the few mosques that were built. Anatolia provides a most interesting series of examples at Konia and Brusa from about 1200 up to 1453, when Constantinople became the capital of Turkey. From that date the Ottoman architects borrowed freely from the monuments of Byzantium, even when building so far afield as Cairo or Damascus. Persia, Turkistan, and India have an inexhaustible wealth of Muslim buildings of the later periods, and in India the tradition has persisted up to modern times. Strongly marked local characteristics differentiated the later work of the five main schools of Saracenic architecture: Syro-Egyptian, Hispano-Moresque, Persian, Ottoman, and Indian. These differences arose partly from the materials available, but were founded far more on local building traditions.

The ‘Middle Ages’ saw a great variety and development in mosque-planning. The congregational mosque continued to be erected in some countries, the domed tomb-mosque became very popular, and the madrasah (cruciform school-mosque), introduced in the twelfth century, has to be added to the list. The dome came to be a favourite feature of Muslim architecture. In Cairo its form was usually stilted, in Persia and Turkistan bulbous or ovoid domes were preferred, while in Constantinople
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the mosques had low Byzantine domes. Externally, the stone domes of Egypt were decorated with lace-like patterning in the fifteenth century; in Persia they were covered with dazzling glazed tiles. Stalactite pendentives supported them, and indeed stalactites were used everywhere, often in excess, and sometimes hanging from the ceilings like the 'pendants' of our English fan-vaults. But whereas the Saracen dome had little influence on our Renaissance domes in the West, it seems possible that Muhammadan minarets of the graceful type found, especially, in Caïrean buildings of the fourteenth and fifteenth centuries may have influenced the design of the later Renaissance campanili of Italy, and hence some of Wren's fine city steeples. Certainly Muhammadan architects had begun to realize the possibility of using dome and minaret in contrast, by this period; just as Wren afterwards used dome and towers so effectively in contrast at St. Paul's. The rather clumsy cylindrical minaret of Persia, and the pencil-shaped type beloved of the Ottoman Turks, never spread outside their natural homes.

As Saracenic architecture advanced, the round horseshoe and the pointed horseshoe arches continued to be favoured, the semicircular and the ordinary pointed or two-centred arch forms were frequently employed, and the so-called 'Persian' arch—of which the springing-curve turns into straight lines—was largely used in the country of its origin and elsewhere. It somewhat resembles our 'Tudor' arch (Fig. 83). Multifoil or cusped arches became general, and in the form of blind arcing and tracery were used as surface decoration. Battlements were elaborately foliated or cut into saw-teeth. Window-openings continued to be filled with pierced tracery or lattice-work, in stone or stucco, and were glazed with crudely coloured glass, perhaps before stained glass came into use in Western countries. Bands of decorative lettering, modelled in stucco or carved in wood or stone, alternated with geometrical surface ornament, for natural forms were prohibited by the theologians. Bold

Fig. 84. PARALLEL OF MINARETS AND CAMPANILI (not to scale)

A. Madrasah of Sanjar al Jauji, Cairo (1305-4).
B. Torre del Comune, Verona (1172, belfry 1372).
C. Duomo, Solete, S. Italy (1397).
D. Mausoleum of Resulp, near Cairo (1400-10).
E. Duomo, Lecce, S. Italy (1661-82).
carving in high relief is seldom found in the Muslim buildings of Egypt, though it may be seen in India, and effect is obtained by the free use of very delicate geometrical surface-patterns, incised rather than carved, in stone or stucco. Farther east, in Persia and Turkistan especially, where brick is the normal building-material, a plentiful use is made of glazed tiles. For their design geometrical and abstract forms were favoured up to late periods, when a more naturalistic treatment was adopted, introducing floral forms. The name 'arabesque', given to the conventional patterns in low relief used in England from Elizabethan days onwards, indicates that here we owe something to the Arabs of the Middle Ages.\(^1\) Another form of ornament, common in Cairo but not so much used elsewhere, was the alternation of dark and light stone in horizontal courses. The origin of this practice may be ascribed to Rome or Byzantium, where 'lacing-courses' of brick were often introduced at intervals in stone walls, but the matter is open to doubt. Hence the striped façades of marble buildings in Pisa, Genoa, Siena, Florence, and other Italian cities may conceivably be derived from Cairo, with which they had close trading relations during the Middle Ages. Similar polychrome masonry may be seen at Le Puy in Auvergne, and, nearer home, at St. Peter's, Northampton.

Summing up the numerous points mentioned during this survey, it is clear that the accumulated architectural debt of the Western world to Islam is substantial. In the realm of military architecture alone we have seen that the Crusaders, who left many fine churches and fortresses in the Holy Land, themselves learned something of the art of fortification from their Saracen foes, who in their turn had profited by the skill of Armenian masons.

Excluding all count of our debt to the pre-Islamic stone buildings of Armenia and Syria and brick buildings of Iran (to

\(^1\) On all these points see Chapter X, 'The Nature of Saracenic Ornament', in my *Muhammadan Architecture*, etc. (Oxford, 1924).
which scholars increasingly tend to attribute the beginnings of our medieval vaulting-system, we may reasonably ascribe the invention of the pointed arch to Muslim buildings in Syria and elsewhere. The ogee arch almost certainly, and the 'Tudor' arch possibly, have a similar origin. The use of cusps and of multifoil arches comes from the same source, as probably does the tracery-patterning of surfaces, and perhaps even the use of bar-tracery in windows. Plate-tracery may be derived from the pierced geometrical lattices in stone and stucco of the early mosques, or it may have originated still farther back in pre-Islamic Syrian or Mesopotamian buildings. The invention of stained glass is sometimes attributed to the East, but that attribution has not yet been proved. The use of engaged shafts at the angles of piers, so important in the history of Gothic vaulting, is a Saracen innovation of the eighth or ninth century. Ornamental and pierced battlements came from Mesopotamia to Cairo and were thence transmitted to Italy, afterwards becoming a feature of Gothic architecture. The carved inscriptions used decoratively in late Gothic work were anticipated in the ninth century at Ibn-Ṭulun's mosque at Cairo, but inscriptions in Kufic characters penetrated far into France during the Muslim occupation of her southern provinces, and rare examples of ornament even in England are believed to show Arabic influence (Fig. 85). Striped façades may have come from Cairo, also possibly the design of Renaissance campanili and Renaissance shell-niches. The Arab mashrabiyah or lattice of woodwork, used to conceal the women's apartments of a house or as a screen in the mosque, was copied in English metal grilles. The decoration of surfaces

1 e.g. the carved wooden doors by the Christian master-carver Gaufrédus in a chapel of the under-arch of the Cathedral of Le Puy, and another carved door in the church of La Voute Chilhac. Bands of ornament on the Ratledge of Westminster Abbey and on certain early stained-glass windows are attributed by Prof. Lethaby to a similar origin. See A. H. Christie, 'The Development of Ornament from Arabic Script' in the Burlington Magazine, vols. xl-xl, 1922.

in low relief, by means of 'arabesques' or diaper patterns, and the use of geometrical patterns in decoration, is certainly a part of our debt to the Muslim peoples, who were also the source of much of our knowledge of geometry. All these are specific points, but the close contact of East and West during the Crusades and (more amicably) during the later Middle Ages must have contributed other influences on architecture which have escaped notice in this cursory sketch. In Spain the Moorish tradition in design persisted right into the late Renaissance period and helps to account for many of the complexities and peculiarities of Spanish Gothic architecture. Lastly, it may be observed that the development of Muslim building still proceeds in some of the remoter countries where it has flourished for more than a thousand years.

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