AN OUTLINE OF ISLAMIC ARCHITECTURE

R. A. JAIRAZBHJOY
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Regulations for house building in general are necessary; they are required for the comfort of the army and are a source of splendour for the Government. Mighty fortresses have been raised which protect the timid, frighten the rebellious and please the obedient. Delightful villas and imposing towers have also been built. They afford excellent protection against cold and rain, provide for the princesses of the harem, and are conducive to that dignity which is so necessary for worldly power. Everywhere hostels have been built, which are the comfort of travellers and the asylum of poor strangers. Many tanks and wells are being dug for the benefit of man and the improvement of the soil. Schools and places of worship are being founded, and through them the triumphal arch of knowledge is newly adorned.

Abul Fazl—in praise of Akbar’s enterprise.

I grant willingly that the structure is not according to the rules and orders of Architecture which we esteem is indispensably to be followed, yet I observe nothing in it which offends the eye; but rather find all to be well contrived and well proportioned: And I do even believe that if in Paris we had a Church of this way of Architecture it would not be disliked, if there was nothing else in it but that ’tis of extraordinary and surprising aspect.

Tavernier—on the Jami Masjid of Delhi.
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Having served as a textbook in colleges in England and America for some years, this book has been out of print for a considerable time.

This new edition looks better in format, but its content remains largely unchanged. Some passages have been added here and there, and one or two excluded. One whole chapter—that of the impact on Europe—has been omitted for reasons that need explaining: one, that it breaks up the sequential narrative, two that it is not everyone's cup of tea, and three that at the present time it is not to the liking of the academia.

I am aware that I have not always churned up the material in the same old garb, but sometimes seek new venturesome paths. Such solutions can only be provisional and not absolute. There is only one Master of the Universe who knows it all—the rest of us must struggle to understand and explain with the evidence at hand.

Architecture can be a dry subject if its technical details are not relieved by human interest. I have pored through ancient texts to seek these out in order to enliven the account.

The historian endeavours to fill in the lacuna where so much has perished. It is a pathetic task, since only a fraction of buildings have survived to our day. Take the case of Medieval India: a text claims that there were in Akbar's Empire (in the 16th Century) 120 big cities and 3200 towns each having under it a hundred to a thousand villages.¹ We deplore the loss, but let us also be thankful for the wonderful edifices that still remain.

In a history we need to be selective. My own approach when possible is to select only that which is new and original, and which is not just a variation of the past. Others may prefer a more comprehensive treatment. Fortunately such books have appeared lately for those who would like more,² and I would be the first to recommend them.

NOTES


1 Arabia, Syria, Tunisia, and Mesopotamia

No Religion has radiated across the world with such rapidity as Islam; and no culture has so completely cast its past aside and adventured into the unknown as that of the Arabs. Between the coming of a new dispensation among the Arab tribes and the passing of Muhammad (PBUH) and his Companions, such deep-seated transformations took place in human nature and society that they seem scarcely credible. The transmuting alchemy of Islam not only united its believers in purpose and faith, but swept away all biases of race, nation and origin, and enabled the sharing of explicit truths on a high level of spirituality. Coming thus upon the verities of a faith for which they had subconsciously yearned, these were elated beings eager to grasp one another in fraternal ties. Concertedly they were prepared to face the high destiny that awaited them, and before they were even fully aware the centrifugal force of Islam sent them whirling off on a world-rejuvenating errand. The Arab who was but lately reformed was ready to reform the world on the basis of the policies of God decreed in His final Communiqué. It was in other words a kind of frenzied philanthropy. The frenzy was checked at all points by the severe regimen of an ethic which prevented the power released into the being from going off on senseless rampage. Thus, the vast spate of energy was steered into constructive channels. Conquest was not the end but the means of making possible a higher level of existence. The Arab should be judged by what he made of those means.

Muhammad (PBUH) was aware that the desert bedouins of Central Arabia were a chronically stagnant race, and he knew too that unless they ventured into the outside world there would be no hope of their cultural advancement. His advice to them to 'go even unto China to acquire knowledge' henceforth determined their attitude toward their alien subjects. In complete contradiction with their past, everywhere they journeyed they learned with avidity. From time immemorial they had lived unmindful of the brilliant civilizations that lay beyond their northern frontiers. Now they turned all they saw of value in these lands to good account. Once they had admitted they had much to learn from their erstwhile enemies, they made them their associates. So in the end there was a kind of double-edged victory in which both the victor and the vanquished gained by war when the peace was won. In this sense at least war was reduced to less of an evil than it has ever been; for a civilization grew on the base of the old destruction that more than made amends.

Arabia was the birthplace of Islam, but it was the faith and not the land that gave the first impetus and final colouring to the architecture of Islam. Arabia was a parched peninsula which gave no natural stimulus to civilizing endeavours. There were two exceptions to this. In the North the Nabateans carved monumental tombs on the rock face apparently under Greco-Roman inspiration with façades imitating temple fronts and having pediments, friezes, metopes, triglyphs, and pilasters. They also built temples with rather more inventiveness. In the South the kingdoms achieved a certain prosperity due to artificial irrigation, and to commerce carried on by their merchants and sailors in spices, incense, and gems. This is what the Greek and Roman writers meant when they described these southern regions as Felix, The Happy. Agatharchides the Alexandrian writing in 113 BC, spoke of the luxury of Sabaeen plate and sculpture, furnishing of beds, tripods, and other household embellishments, of gold and silver ornamenting the pillars, of vases crowning doors, and of interiors of houses matching the beauty of their outward appearance.1 Excavation in recent years at Marib and Timna has revealed evidence of their material prosperity and artifacts that show
the skill of their sculptors, bronze casters, and masons. The hundreds of refined alabaster statues found dispel the old belief that Semites have an aversion to human portrayal. As for the town dwellers and nomadic inhabitants of central Arabia they may not have been the savage barbarians they are so often depicted, but they were no doubt uncouth and singularly devoid of racial or cultural ambition. This is attested by the almost total absence of the visual arts in an indigenous style even after the advent of Islam. What little there was of the household crafts was confined to portable objects. Poets and musicians there were in the Jahiliyyah period (‘days of ignorance’), and even educated scribes, but a work listing the trades of nobles before Islam cites one carpenter by name and others including a weaver, a bookbinder, and a blacksmith such as might be found anywhere at the time. It is not surprising, therefore, that the simple cubical structure reconstructed fourteen years before the Hijra (AD 608) in Mecca was left to an Abyssinian Christian Bakoom who happened to be shipwrecked on the Red Sea Coast. Doubts have been cast on the validity of this tradition repeated parrot-fashion by the chroniclers, but it has been suggested that a further evidence is that the building materials consisted of alternate courses of wood (timber from the wreckage) and stone, as this fashion was prevalent in Abyssinia at the time. The name of Bakoom may well be Abyssinian, but the constructive evidence is not entirely conclusive, since the technique of timber courses in ashlar masonry has long ancestry in the Near East. It is found, for example, in a place of the 15th century BC, at Alalakh, in an 8th century BC place at Tainat, and in the lower place at Zenjirli, at Tell Halaf, and at Carchemish, in Troy, Mycenae, Beycesultan, Ur, Babylon and Amarna, in Crete particularly in Middle Minoan IIa and b, the courtyard wall of Solomon’s Temple (1 Kings vi, 36; vii, 12), in the brick ramparts of Jericho from the Solomonic period, and even in Southern Arabia judging from a Minean inscription, which refers to a tower and its passage made from foundation to summit with wood and stone. We may recall here that Philonius of Byzantium describes chains of oak beams laid lengthwise in the stone work of the façades and towers at six foot distances apart so as to localize the effect of enemy missiles on the wall and to make repairs easier.

Muhammad (PBUH) selected the Kaaba as the symbolical locus of Islam because it was generally believed, and the Quran stated (2. 125f.), that it was in this amphitheatre of hills encircling Mecca that Ismael son of Abraham had built the first house to the One true God. Why the cube-shape was selected in the first place we do not know for certain, but there are references to a cubical shrine in Solomon’s Temple in Jerusalem in which was kept the Ark of the Covenant (1 Kings vi-20; cf. Revelations xxvi. 16). The Muslims thereafter continued to retain an approximate cube shape in spite of their many reconstructions. Was it because they were aware that this shape was more “noncommital” than any other in that it reflected a minimum of human personality? The word Kaaba is in any case clearly derived from and actually means cube—thus evidently a loan word from the Greek kübos. There were other Kabas in pre-Islamic Arabia including those of Banu Ghatafan and Khalasa and at Najran, though it is not known if they were cubical. One other similarity may be noted: the Black Stone, believed by Muslims to be a divine token, is uniquely inset in one of the corners of the Kaaba, which recalls the passage in Isaiah (xxvii. 16) in which God lays a precious cornerstone in Zion. Moreover, the annual draping of the Kaaba with an embroidered cloth is reminiscent of the covering of the Jewish Tabernacle with rich draperies such as coloured Egyptian linens and fabrics of animal hair and skin.

The Kaaba was destroyed by fire in 683 and reconstructed by Ibn al-Zubair. This time its material was stone only, its height and length were increased, and mosaics were introduced here from a church in Sanaa. When the Kaaba was rebuilt after further war damage by the Omayyad Governor al-Hajjaj in 693 there was introduced a double roof with four apertures in it for light (Figure 1). The dimensions, the disposition of the various decorative features, and the relics contained inside, have been reconstructed with the aid of medieval accounts.
The practice of orientating the house of worship in a designated direction also goes back to remote antiquity. The Greeks for instance generally faced their temple East to let the early morning sun enter the sanctuary, so that the gods could ‘face the rising sun ……with gleaming eyes’ (Aeschylus: Agamemnon 519–20). This eastward orientation of the temple toward the sun is directly testified by such writers as Plutarch (Numa. 14,4). The idea had long survived for already the Giza pyramid is orientated to the true east, the true equinoctial point of sunrise, and in the 5th dynasty the sun temple of Ne-Woser-Re had its pyramid orientated to the East-West axis with the altar toward the rising sun. And although a similar orientation is apparent in Akhnaton’s Aten temple at al-Amarna, and, it is argued in Solomon’s Temple in Jerusalem, Egyptian texts sometimes describe the orientation of temples to other heavenly bodies—one, for example, refers to the corners of the temple of the goddess of Dendra looking at the constellation of the Bull’s Thigh (the Great Bear). Similarly, while the temple of the Syrian goddess looked to the rising sun according to Lucian (29) as did the majority of Nabatean shrines, the high places of Petra are orientated toward the West, to the rising new moon. Vitruvius had argued for a westward orientation, and the Christians actually had faced their basilicas west until the 4th century; thereafter they turned them toward the Holy Land after the fashion of the Jews, who had themselves been bidden to pray toward the Temple in Jerusalem (1 Kings, viii, 44). Muhammad (PBUH) himself changed the orientation (qibla) of his Medina Mosque from Jerusalem to Mecca after the second year of the Hijra (624) on the basis of a revelation in the Quran. The Quran says (11, 136) that only fools will query the motive of this change for to Allah belongs both east and west, and the only reason for the old qibla being in the direction it was to distinguish the followers of the Prophet from those (pagans) who spurned Islam, and the only reason for the change to the new one was to have a qibla that would be permanently pleasing to the Muslims. This change was inevitable since Mecca and not Jerusalem was the true centre of the faith, and as Ibn Hisham reports when the Prophet was regretfully parting from the city he said, ‘you are the favourite place in the world to me, and you are the most beloved place to God……’.

It is true that in later times Muslim architects did not always succeed in rightly orientating their mosques though they were certainly conscious of this problem. A treatise on determining the direction of the qibla was written by Abul Abbas Fadl from Nayriz (d. 922/3), anticipating the rule of the shadow method of Abul Wafa (d. 998). Later still Hamdallah Mustawfi describes the method of determining the qibla by means of the Indian sundial, and also gives tables drawn up by order of Sultan Sanjar for determining the qibla in Iran. Ulugh Beg, however, could not have been satisfied with it for he used spherical trigonometry for the purpose.

The Medina Mosque was founded by the Prophet in the year of his flight from Mecca in AD 622 which became the first year of the Islamic calendar. The site chosen was the spot his camel sank down to rest on the completion of the journey. As originally built it was no more than a low wall of sun-hardened clay bricks enclosing a rectangle 70x60 cubits with three entrances. A flat roof of compacted mud and palm branches was erected on palm trunk pillars on the qibla side of the court. On the opposite or north side of the court was a portico for the Prophet’s homeless followers, the Suffa, accommodated there out of
sheer necessity. This naturally resulted in the court having an informal character, though the Prophet did forbid misdemeanour and loud arguments in it. Outside the east side of the court (with doors opening into the mosque) was a series of huts in the same impermanent materials for Muhammad and his wives. Each was about 12x16 feet, though the ceiling was only about 7 feet high. In one of these the Prophet died and was buried in one partitioned half, while Ayesha continued to live on in the other half. Despite his frugality, the Prophet did not disdain all luxury; he is known to have worn rich vestments on ceremonial occasions, and to have been a connoisseur of exquisite perfumes. Western writers stress the tradition in which Muhammad is presented as frowning on needless investment in domestic building, but they do not care to remember that St. Paul preferred living in a cave and deprecated ‘this disease of building,’ and in particular deplored the architecture of Imperial Rome. We know on the contrary that the Prophet not only participated in the construction of a pious dwelling for one of his followers, but in the erection of his own Mosque himself carried bricks, and described the task as ‘more pure and holy’ than defending the faith with arms. There is a hadith (saying attributed to the Prophet) that ‘for him who builds a mosque, God will build a home in Paradise.’ Evidently the Prophet’s Mosque was not the first to be built for the new faith, for Ibn Hisham attributes the first one to Ammar ibn Yasir. Moreover, a mosque already existed in Quba near Medina in 622 which had been erected by the Banu Salim, and another in Medina itself next to the site of the Prophet’s own Mosque. That there were other mosques in the Prophet’s time is suggested by the Quran (II, 183) which refers to the faithful praying in mosques (in the plural), while in Sura xxiv, 36f. Allah gives permission to build houses of prayer. In another passage (xxii, 41) mosques (masajij) are distinguished from synagogues (biya), hermitages (sawami), and oratories (salawat). The Prophet himself ordered the mosque at Sanaa to be built according to Ibn Rusta, and he intended other mosques to be built in Mecca and Jerusalem.

Any religious reform in its first fervour is accompanied by self denial or moderation. In domestic building in Islam we see this exemplified by the attitude of the Caliph Omar when he gave permission for the rebuilding of Kufa in stone after the houses of reed had been gutted by fire. He imposed a limit of no more than three houses per family, and also a limit of height which he defined as ‘what does not lead you to wastefulness, and does not take you away from purposeful moderation.’ Tabari has a somewhat different account. He says that the governor Saad ibn Abi Waqqas built a superb palace at Kufa on the model of the white palace of Madain (Ctesiphon) whose door he also appropriated. Upon learning of this matter Omar sent an envoy to burn the palace with the rebuke that Saad was following the errors of Kesra and abandoning the principles of the Prophet. Omar added that a single modest house ought to suffice in this world for living, and another for depositing and guarding the public treasure. Saad thereafter followed the Caliph’s advice. Ziyad ibn Abi (d. 675/6) might perhaps have gone to an excess of self-abnegation for though according to Ibn al-Faqih he built seven mosques and three public baths, we are told by Ibn Asakir citing Asmai that as viceroy ‘he never set one brick over another or planted a palm tree for personal use.’

A number of subsequent reconstructions altered the Mosque of Medina beyond recognition. In fact, in the next two and a half centuries it was enlarged and adorned on fourteen separate occasions—each monarch adding whatever had been fashionable elsewhere so that it would lack nothing except of course consistency and character. For example, in the most important of these under the order of al-Walid in 707–9, as we know it from literary sources (figure 2) the columns consisted of superposed sections of bored drums reinforced inside with iron rods directly supporting the roof, the glass mosaics and the idea of using four corner minarets undoubtedly emanated from Syria, while the semicircular mihrab niche is suggested to have been the work of Coptic craftsmen. This it seems is plausible since Samhudi reports that the side walls and the back were erected by Greek craftsmen, whereas the Copts were responsible for the prayer hall. At any rate the alien character of al-Walid’s Medina Mosque led an aged Arab to exclaim to the ruler who came to inspect the work, ‘We used to build in the style of mosques, whereas you build in the style of churches.’
Thanks again to the evidence of literary sources we know that the original mosque served as the embryo from which the later congregational Mosque derived. The fact that the covered portion did not at first extend all the way round the court suggests that there was no direct emulation of the Hellenic peristyle or Roman atrium. In any case we now have a prototype in Arabia itself in the pre-Islamic Temple at Hugga in the Upper Yemen whose court was surrounded on three sides with pillared cloisters, while a high enclosed shrine edifice with porch lay on the principal side.

Similarly, there could have been nothing more rudimentary than porticos made up of wooden posts supporting roofs. This early precedent led afterwards to the tendency to keep more aisles on the sanctuary side of the court, though part of the reason may have been to make the qibla side distinguishable from the other three sides, and also to break up the dead uniformity of the court. Moreover, the first mosque of Islam set a social precedent as well. It conceived of the mosque as something more than a place in which to pray. In it indigents were sheltered, men relaxed or held free converse after prayer, and it is said, even camels were tethered within the court beside the entrance. This multipurpose and semi-mundane function of the mosque had far-reaching results. If in Sumerian times the temple was a huge complex including within it palace, government offices, stores and factories, the mosque of Islam was even more completely a centre of spiritual and secular life. So long as law and government were the handmaids of religion, it served not only as a place of assembly and treasury, but by the annexing of subsidiary buildings in later times as an asylum, a school, a sanatorium, a library, a tomb, and a kitchen all at the same time. Indeed it might have been described as a kind of cantonment with a life of its own where prayer, learning, and beneficent institutions combined to care for the body, mind, and spirit of the people. Alas, today even the hosts of hangers-on are gone and for six days in the week the patios of the mosque are forlorn.

The Mosque that was built in Kufa (an outpost founded on the route to the East) in 638 perpetuated the practice of joining the Governor’s Palace to one of the flanks of the mosque. Here the wall-less enclosure surrounded by a ditch was measured off by the strange system of casting arrows like javelins—two arrow-casts.
constituting the length of each side. We cannot regard this as an example of carefree attitude toward dimensions by the Arabs since on this very occasion the Governor of Kufa Saad ibn Abu Waqqas had received orders from Caliph Omar to lay out the roads on a scale of fixed dimensions according to respective importance, such as 60 cubits width for cross roads, 40 cubits for main streets, 30 and 20 cubits for secondary roads, and 7 cubits for lanes.49

Later in 670 a flat-roofed portico resting on extremely tall reused Persian columns 30 cubits high was added consisting of five rows on the south or qibla side, and two on each of the remaining three sides of the court. If Tabari (1, 2849) is to be trusted the ceiling was decorated after the fashion of Byzantine churches. This enlarged mosque of Ziyad ibn Abih could (according to Yaqt) now accommodate 60,000 persons, whereas it could hold 40,000 before. Tabari says the Governor's Palace was built, by a Persian architect Ruzbih, facing the mosque, but at Basra Ziyad's palace of sundried bricks was built at the back of the mosque, in the opinion of Baladhuri to prevent the Imam from walking over the shoulders of the people.

In the meanwhile, Muhammad (pbuh) had died (632), Abu Bakr had restored law and order and compiled the Quran, and Omar the Great had launched his extensive campaign. The process of conquest had gone on gathering momentum: Syria capitulated in 640, Egypt in 640/41, and Mesopotamia followed in 646, and to those were added large parts of Khorassan and Turkestan within the next thirty years. Ali, the cousin of the Prophet, had been elected the fourth Caliph after Osman's death, but he soon found that Muawiya, the Governor of Syria, was too popular and powerful a rival to contend with. Instead of establishing the hereditary right of his own family as was his hope, it came to pass that upon Ali's death, Muawiya seized the title and perpetuated his own dynasty. And now the comparatively brief term of the Omayyads was well under way. Muawiya was an alert and far-sighted ruler. His first act was to transfer the capital (which Ali had shifted from Medina to Kufa in 657) to the city of Damascus in 661. This swing in the capital of the Empire was accompanied by a shift of architectural activity—a phenomenon that was to be repeated over and over through the Muslim world. The importance of Muawiya for us is that it was he who began the practice of dwelling in the undisguised splendour befitting a monarch. When, as Ibn Shakir (d. 1362) says,50 the Byzantine ambassador condemned his original brick palace as a hovel fit for birds and rodents, the Caliph promptly demolished the building and replaced it by one in stone presumably less despicable. The palace was described on the occasion of Mutasim's visit as being completely paved with green marble, and having a great water-basin in the court which irrigated a garden.51 According to ad-Damiri, Muawiya was the first to adopt private apartments for women, and to introduce the institution of a guard and a curtain.52 Later this curtain served to separate the Caliph from his courtiers, singers, and musicians in the evening entertainment in his saloon.53 To him also is attributed the precedent of using a throne, kursi, though the pretext on which some historians say he requested its use from the people was that he had become corpulent. Previously, the conqueror of Egypt, Amr ibn al-Aas had to remain seated on the ground while the Byzantine Governor Muqawqis had sat before him on a golden throne.54 When Amr adopted the pillow to recline against while in the presence of his companions Ibn Asakir (d. 1176)55 records he was asked to give up this Persian practice in all but the privacy of his own home. Whether these details are legendary or not they reveal the intense social democracy of the early years. We have a good example of this in the command Caliph Omar sent to Amr in Egypt on learning he had begun using the pulpit, requesting him to destroy it since he was raising himself above the necks of the Muslims.

Though Muawiya resided in Damascus, the Bedouins were on the whole not easily urbanized. His lesser descendants shirked the heavy responsibilities of government and built steam baths and hunting lodges in the Roman-Syrian fashion in remote country sites or on the edge of desert wastes. At the outset they may have been prompted by the health-giving air of the desert in springtime, or by the urge to recover that solitude which was their nomadic legacy. But by and by they began to
indulge in fugitive pleasures to their hearts’ content. Whatever their motives, the itinerant camps of old could be folded up for ever: the nomad was being compelled to acquire some roots.

The best known of those Omayyad palaces is that of Quseir Amra in the Jordan desert. It might have been built some time between c. 730 and 743, for had it been built before it would scarcely have survived the Iconoclastic Edict of Yazid II in 721, during which among other vandalism a statue was broken in the bath of his cousin Zabban ibn ‘Abdal Aziz.\(^{56}\) Since the palace of very modest dimensions was built for an Amir and not for a Caliph as we know from the inscription, Yazid III before he became Caliph in 744 seems to fit the bill, particularly because he expressed a sentiment which would seem to be portrayed on the walls.\(^{57}\) The hemi-cylindrical outline of this palace of modest size recalls at once our modern quonset huts, or yet those ghorfas used for grain storage in the desert cities of North Africa.\(^{58}\) This is because its three parallel tunnel vaults are expressed as such on the exterior and are not disguised by gable roofs. They rest on slightly pointed arches that straddle the room in a longitudinal direction, thus destroying the illusion that they are transverse vaults, which they would be but for the position of the entrance (FIGURE 3). At the opposite end of the entrance door the hall terminates in a throne recess flanked by two dark mosaic-paved (bed?) rooms that appear on the exterior as apses. Annexed to the left of the audience chamber is the bath consisting of a barrel-vaulted changing-room opening into a groin-vaulted room maintaining a tepid temperature. Beyond it is a steam room flanked by half-domed niches, and roofed by a dome lighted by windows and supported by spherical triangle pendentives. Such pendentives are in a better state of preservation at another bath of identical plan known as Hammam as Sarakh (c. 730) in the same vicinity, where the dome of unhewn shale is carried on a gore of ribs once covered with plaster, while the tunnel vaults over the main hall are of light volcanic scoriae.

At Quseir Amra in addition to zodiac figures denoting heavenly constellations frescoed in the cupola, there is in the audience hall a representation of the conquered enemies of Islam, the palms of their hands open in token of their submission—the Kings of Byzantium, Spain, Persia, and Abyssinia, and two faded figures which may have been an Indian Raja and a Chinese or Turkish Emperor. The idea derives from the custom of depicting Kings of the Earth acknowledging fealty to their Lord—an ancient Oriental practice kept alive until Sassanian times.\(^{59}\) If Yaquf (1224) is to be believed there was actually a representation at Kermanshah of four named kings brought together by the Sassanid ruler Khusru Parviz.\(^{60}\) Hamdallah Mustawfi (1340) takes literally what was intended to be a symbolical gesture for he says that these very kings—the Emperor of China, Khaqan of the Turks, Raja of India, and Caesar of Rome—came to a banquet prepared by Anoshirwan at Kermanshah and kissed his hand (in obeisance).\(^{61}\) That an Omayyad Caliph harboured thoughts in this fashion of being the king of kings we know from al-Jahiz of Basra (767-868) who quotes the words of Yazid III (reigned 744), ‘I am the descendant of four kings—Kisra, Khaqan, Caesar and Marwan’.\(^{62}\) This was true in the sense that the Caliphs had largely dispossessed them, and had, moreover, inherited from them some aspects of their cultural legacy. In the account based on Suleiman the merchant (851) the King of China, acknowledging the wealth and power of the Caliphs, places them first, next himself, and then the kings of Greece and India.\(^{63}\) Near the figures of the Kings at Quseir Amra...
significantly is a figure personifying Victory with the Greek word ‘Nikhe’ identifying her.64

The figures of the zodiac in the dome of the steam room may be based on a Hellenistic original, but again the idea of the dome as a heavenly vault is first encountered in the East, where as we know from Philostratus the judgement hall of the Parthian king in Babylon in c. AD 40 was covered by a dome within which on a blue ground were fixed images of the gods ‘looking like golden figures shining out of the ether.’65 The idea had been revived by the Sassanian Khusru II in his planetarium the Takhti-e Taqdis near Ganjak (destroyed by Heraclius in 624)66 where the king was depicted within the rotating dome amid moveable astral bodies. According to Thaalibi the position of the stars permitted the reading of horoscopes as well as telling the time, while Firdausi affirms that the revolution of the dome was based on the season and the zodiacal signs. The revolving aspect of the latter had already been anticipated in the dome of the banqueting hall at Nero's Golden House in Rome (AD 65).65

Other wall surfaces in the bath and audience hall at Quseir Amra are painted with figures of bathing nudes, gymnasts, (plate 1) mothers with babes in arms, dancers, musicians, animals such as mocking apes, and a scene of hunting dogs pursuing their prey and another of game being killed in a netted enclosure, and a number of genre subjects denoting the trades and crafts of Syrians of that time. And if there is any doubt that all this was executed in the early years of Islam for a Muslim prince, it is dispelled by a fragmentary bilingual inscription in Greek and in Arabic naming the figures of Caesar, Roderic, Chosroes and Negus, and others in Arabic only including one incomplete one at the back of the throne alcove on a painted canopy framing the owner seeking the blessing, safeguard and mercy of God, and another over a window of the hall which reads ‘O, my God, bless the Amir as you have blessed David and Abraham’.68

Nor is there anything extraordinary about the use of painted figures in a Muslim secular building. The tradition that Muhammad (PBUH) himself condemned the painter in one of his private statements seems not to tally with his love of poetry, which was with the Arabs a kind of verbal painting. On the contrary it is known that the Prophet forbade an effigy of the Virgin and Child being effaced from the pre-Islamic Kaaba because, as Azraqi (d. 858) says, ‘He was touched by its appealing beauty,’ (Mecca ed., I. p. 106) and that he continued to let his wife Ayesha possess her dolls (Muslim, Sahih II. 218), and also to wear a garment with printed figures on it according to Bukhari c. 870. Moreover, the carpet in his own room had figured patterns (Hanbal, m. 151, 5d, I) not to mention the dyed stuffs and curtain hung against the doors.69 The Prophet asked Ayesha to draw the curtains aside, since its representations (tawwiruhu) kept distracting him from prayer.70 Had the injunction against living forms been absolute, the effigies of the Caliphs would scarcely have been stamped on Imperial coins so soon after the Prophet's death, nor would the Muslim conqueror of Ctesiphon in 637 have held a prayer in the ivan of Khusru, which was painted with figures of men and horses (Tabari, Cairo ed., iv pp. 173–4), a painting which survived at least up to the time of al-Buhuri (d. 897). The traditional saying of the Prophet as cited by Bukhari (Sahih, Bulaq ed. vii, p. 61) to the effect that the painter will have to breathe life into the form he has fashioned on Judgement day, was also taken to be not an absolute stricture. The Persian writer Abu Ali Farisi (999) expressly says that this prohibition is directed against the representation of God in a bodily form, and anything apart from this is open to individual interpretation, a view which he states the consensus of the ulama did not deny. Throughout Muslim history the Caliphs of the Empire, the Governors of Egypt, the Amirs of Spain, the Shas of Iran, the Sultans of Turkey, and the Emperors of India, have delighted in figural adornments in their palaces without a pang of remorse, though they took care to keep them out of their religious art.71 The Quranic prohibition was, after all, directed against serving idols (sanam) and not against human portrayal or pictures (suwar) as such.

Relevant to the Bath at Quseir Amra is the fact that some medieval Muslim authors stoutly defended the use of figurative painting in baths on rational grounds. Thus al-Ghuzuli (1300) says: 'In good baths you also find artistically painted
pictures of unquestionable quality. They represent, for example, lovers and beloved, meadows and gardens, and hunts on horseback or wild beasts. Such pictures greatly invigorate all the powers of the body, animal, physical and psychological.\textsuperscript{21a} Moreover, the philosopher Badr ad-Din (a Kadi of Baalbek) adds that: ‘all physicians, philosophers, and respectable men agree that the contemplation of artistic and beautiful pictures gladdens and delights the soul, removes melancholy thought and hallucinations from it, and transmits matchless strength to the heart by keeping evil thoughts away from it. If it is difficult to find beautiful forms (in nature) one should contemplate beautiful artistically made pictures as painted in books, temples or noble castles.’\textsuperscript{9}

Not all theologians agreed, and for example Ibn al-Ukhawwa (d. 1329) declares that pictures about the doors of the hammam or inside are forbidden by the law, and must be removed.\textsuperscript{72}

One of the most recently excavated palaces is Qasr al-Hair\textsuperscript{73} further designated as al-Gharbi since it is situated west (of Palmyra). It was built for Caliph Hisham in 727. Here the bath was a detached building with a fairly ample apodyterium or changing room, and the hot rooms had hypocausts or flues beneath the floors which were carried on columns. As for the main building, the reconstructed model at the Museum of Damascus indicates six self-contained suites of rooms disposed round an open court on two floors, both prefaced by a covered gallery carried on beams and columns. The dadoes of these rooms are painted with lozenges and zigzags\textsuperscript{74} and other designs imitating veins of carefully joined sawn marble slabs.\textsuperscript{75} The tympani of stilted semicircular arches opening into these rooms are covered with an astonishing variety of openwork stucco designs such as interpenetrating polygons or segments of circles, oblique trellises and so on. One particular design among the stuccoes of Qasr al-Hair—bordered hexagons inscribing circles with rosettes—is to be found already in the carved ceilings of Roman Baalbek. At the Arab palace balustrades and archivoltis are also of carved plaster, though they are traced freehand into eminently stylized leaves, buds and flowers—some of composite type—and one arch at least has a vine meander inhabited by peacocks and cupids. The monumental gateway re-erected at Damascus (\textit{Plate 2}) has all over stucco relief repeating designs on its semicircular salients. The geometric grids in large rectangular panels are insistent reminders of the later North African minarets. The arrow slits in the stepped crenelations are also of some interest. In the spandrels of a series of shell niches are women with tresses (the alternating semicircular and triangular pediments here are of Roman origin\textsuperscript{76}), and in the topmost register women in classical poses and drapery. Figures again adorn the interior. On the parapet are rampant confronted lions, women bearing cornucopiae or fruit,\textsuperscript{77} and a ruler seated on a throne. The enthroned ruler recurs on the back of the gallery on a much larger scale, and there is also a rampant rider as well as a blind trefoil panel, a surprisingly early example of the form (\textit{Plate 3}). In seeking the identification of the figures sculptures we would do well to recall that later the Tulunid ruler Khumarawaih (884–96) displayed in his palace in Egypt painted wooden statues representing himself and his harem and singing girls.\textsuperscript{78}

Now this large-scale employment of stucco\textsuperscript{79} is one of the earliest uses of this medium in all of Syria,\textsuperscript{80} though it had been known in Mesopotamia as early as the 1st century AD. In Mesopotamia, it would appear, stucco was more often moulded than carved. Other testimonies of ancient influence are apparent at Qasr al-Hair. Of the two large frescoes found on the floors of the rooms once containing wooden staircases, the dragon-tailed mermen with spears and naturalistic vine borders are clearly based on late Hellenistic prototypes, just as the neighbouring medallion with a feminine figure holding a scarf full of fruit goes back to the Earth goddess Ge, the personification of Seasons\textsuperscript{81} (\textit{Plate 4}). On the other hand the young equestrian (with fluttering scarf and feet in stirrups) drawing bow at full gallop, and the languid figures of the lute and flute players stem directly from Sassanian art in details of dress accessories, though it must be remembered that the theme of the chase on horseback goes back to an ancient tradition immortalized by the great Assyrian kings. Letters written on marble in Parthian and in Arabic were found at the Gharbi Castle, as well as the figure of a ruler in Sassanian dress. Now the presence of the Sassanians so far West is not surprising as already.
in 643 a Christian slave from Nihavand in Persia was in Medina serving as carpenter, designer and smith, while Muawiya had employed Persian builders to rebuild in brick and mortar the sanctuary at Mecca, in addition to settling a considerable colony of Persians at the garden city of Sidon. It is noteworthy that an enclosed garden irrigated by a barrage disseminating canals has been identified at the site we have been discussing. Game may have been kept in this garden for in one of the frescoes was to be seen a man with a key in his hand leading an animal. Al-Fakhrī gives us a good description of Mutasim’s game enclosure in the region of the little Tigris. He says when they organized a drive they narrowed its flanks and kept turning the game until it was cornered behind the wall which was many miles in length. Then the Caliph entered with his children and nobility, and having hunted, released the remaining game.

Once again an aerial photograph of another palace of the same name, Qasr al-Hair, but designated al-Sharqi as it is East of Palmyra, clearly reveals a vast walled game enclosure of irregular shape about a mile wide and five miles long fed originally by a system of underground canals. Masudi tells us that Hisham had built subterranean watercourses and reservoirs on the route to Mecca. Subterranean conduits with ventilating shafts at about 60 feet intervals have actually been found at Palmyra.

There are two fortified enclosures of squarish proportions, the smaller of which has for its entrance door-head a flat arch composed of shaped voussoirs, while at the larger enclosure (seemingly a small fortified town to provide for and guard the palace and having its own mosque) these are joggled or interlocked in order to strengthen them. At the former above the door opening is a semicircular relieving arch flanked by concave niches, and at the level of the cornice is a projecting trap on corbels for dropping combustibles on an attacking party (Figure 4). On either side are half round towers covered by brick domes, and while the lower part of the wall is of smooth cut stone eroded by salt action at the base, what there is left of the superstructure is of brick decorated with a register of niched and colonnetted stucco. It is possible to see that the series of tunnel vaults of pointed form opening out onto the court and running along the sides of the interior are also of brick, although they are now almost buried in sand. This use of brick suggests that Mesopotamian craftsmen might have been employed, as Syrians seldom employed it having excellent quarries of stone accessible everywhere. Nevertheless, from an inscription which was removed from the ruined triple-aisled transepted mosque in the greater enclosure it is known that this city was erected by the inhabitants of Homs under the supervision of Sulaiman, son of Ubaid. The inscription states that ‘the slave of God, Hisham, Amir of the Faithful,’ ordered it to be erected in the year 728. This agrees with Tabari’s claim that Hisham founded two castles in the desert of Rusafa.

At Khirbat al-Mafjar, a palace complex near Jericho also possibly built for Hisham between 724–43 (since a scribal exercise on marble was found which invoked Hisham’s name) and destroyed by an earthquake in 747, both Muslim and Byzantine workmen must have been employed as attested by monograms and inscribed fragments found on the site. Here, the strongly salient gateway (Figure 5) was once vaulted and led into a long entrance hall with stone benches along the sides for waiting visitors. The three sets of stucco-revetted clustered piers between the benches engaged to the walls that look so remarkably like
future Romanesque types, used to carry groined vaults, while the portion over the entrance porch was covered by a multifoil barrel vault in stone.

As for the domestic plan, a succession of rooms were arranged round a court and opening onto it without having direct access to their neighbours. Staircases once led to an upper floor. In the centre of the south side was a small mosque with a square minaret engaged to the exterior wall behind the mihrab. On the north side was a long hall with centre supports, and in the cloister of the west side was a double-landing staircase leading down to a sunk court preceding a vaulted crypt lighted by triple windows. It was perhaps a serdab (literally in Persian 'cold water'), a room for keeping cool on summer days. Chancel screens served as balustrades to protect the stair well, and also ran to about a height of a meter from column to column of the portico surrounding the court. Their flanking posts were topped with bulbous ogee finials, while the plaster slabs were engraved with medallion designs containing grape-inhabited scrolls, continuously generating floral meanders, interlooped straps forming rosettes and swastikas staged in oblique runs or disposed in complex multiple figures. The stone capitals found in the court have acanthus carved without succulence in the true Syrian manner. Their volutes are compressed into a limited area, and between the sets of leaf tips are dark recesses coloured red. But these capitals are by no means as varied as those of al-Muwaqqar (720–4), south-east of Amman, where the acanthus is already on the way out or is palmetized, while the rest of the block which has the shape of a truncated conical cube is occupied by foliated tendrils, fleurons, or fleurs de lis. On the abacus are running scrolls, zig-zags, stepped patterns or Arabic inscriptions. One of these capitals has a lengthy inscription naming Yazid, and came from a graduated column in a tank which was used for measuring the height of water. Yaqut (iv 686) records that Yazid II lived at Muwaqqar. We also know that Yazid announced his intention of building a castle where he would be able to retire with his favourite Hababa, but was interrupted in his design presumably by a sudden catastrophe.

The entrance of Khirbat al-Mafjar must have presented a luxuriant effect encrusted as it was all over with incised stucco. The jogged lintel and the door jamb was subdivided into square compartments of stone framed by cable mouldings, inscribing trellis hatchings, circles with interlooped axes, and floral interstitial motifs. The façade was horizontally stressed with long bands of connected quatrefoils and miniature border repeats. On the niches of the gate porch were self-generating cornucopias covering the whole field symmetrically with vine leaves and bunches of grapes, while radiating with the archivolts were rosetted mock arcades. The figure statuary of modelled plaster discovered among the debris when assembled together once again displays in no uncertain manner
the catholic tastes of the early Caliphs, for there are
snorting sows and hurrying hounds amid intertwailing
vines, full-breasted birds with combed heads and
dainty plumage, turbanned busts arrayed in a series
as in a portrait gallery,96 (Plates 5, 6) atlas figures
bearing up the dome of the bath entrance, while
wide-eyed bare-bosomed women hold buncches of
fruits or flowers, busts of men and women in
alternation look down from within the acanthus
foliage (Plate 7) of a hexafoil medallion (at the
owner reposing in his private apsidal chamber), and
on the façade of the bath entrance stood a venerable
sheikh in long frockcoat gown guarded by crouching
lions (Plate 8). Could this have been Hisham
himself, the same opulent ruler who on a pilgrimage
took 600 camels to carry his robes?

The floor plan of the thermal baths situated
north of the palace allows us to conceive an edifice
of grand proportions, though the brick
superstructure has long since collapsed. The
excavators who examined the masonry of the main
hall initially believed it to have been amply lighted
by clerestory windows like a Byzantine building,
and also that its central dome rose above the eight
surrounding vaults which in turn rose higher than
the apsidal walls. This main hall, carried on
composite piers, was undoubtedly an apodyterium
of ceremonial magnitude with an oblong pool of
over 60 feet in length along one of its sides which
was approached by steps. This structure may also
have served for banquets since there is a
representation of a knife, gourd, and leaf in a
mosaic at the focal head of the hall.97 The walls of
this chamber undulate since each is shaped into a
triple apse, and this theme is reflected in the lobed
corner of the pier plans, and in the octofoil plan of
the small caldarium rising over a vaulted
hypocaust. The presence of seats for the latrines in
the baths reveals a Roman idea98 later discarded
by the Arabs. Preserved in surprisingly good
condition along the full area of the apodyterium is
an expansive sequence of floor mosaic of coloured
limestone. These form patterns of concentric
lozenges, roundels with pearl band borders, circles
interlooped at the meeting of their quadrants, and
in the centre of the hall a great medallion
composed of radiating intersecting arcs of
augmenting diameter. The effect is that of a motley
succession of carpets fitted together without
prearranged order. There is also a motif (in
sumptuous private apsidal chamber with dais
reserved for the prince) frequently used in later
carpet designs representing an idealized scene of a
lion, its sinews tensed, its limbs extended, leaping
on a gazelle grazing beneath a symmetrical tree.
The large foliage of this fruit-bearing tree is
rendered in graded tints of blue and green. It is
quite evident that the wonderful sureness of touch
and breadth of conception of the mosaics could
never have been possible but for the centuries of
experience inherited by the craftsmen from such
centres as Antioch.99 The first surviving Muslim
building in which they occur is the Palace of
Khirbat al-Minya on the Sea of Galilee
(or Tiberias) where again one fine mosaic
pavement has for its design a knotted weave such
as one would expect to find in a loom carpet.100
Walid’s name occurs on an inscription in this
excavated palace, and since there is a concave
mihrab in its triple-aisled mosque, and as the
arched niches within the entrance portal (once
domed) are not yet pointed, we may assign this
place to about the year 712.

Finally, we may instance the Palace of Mshatta
over which a great controversy has raged as
regards date and attribution due to the fact that it
lacks an inscription. By comparing certain stylistic
details and the type of materials employed with
other dated monuments it is now agreed, at least
among Islamic scholars, to have been built for
Caliph Walid II in 744, when the Omayyad affairs
had suddenly entered a critical stage and work had
necessarily to be abandoned. Severus ibn
al-Muqaffa says that in 744 Walid II ‘collected
workmen from all quarters’.101 Walid II is known
to have given audience in a vast hall (this agrees
with Mshatta) where he received a succession of
poets without interruption. He is also known to
have ascended to the summit of his building which
dominated the camp of his guards.102 The entrance
façade of the fortified enclosure at Mshatta was
carved above the socle with great triangular panels
punctuated with octagonal and hexafoil rosettes
containing radially disposed combinations of
lotuses and pinecones. In the alternately upended
and rightsided triangles themselves were forests of
vine with heraldically paired animals such as griffins, lions, and oxen insinuated among them. These carvings, now wisely removed to the Museum at Berlin, contain other mythical motifs, such as a cupid bending over a basket of grapes, a dog-bird and human-headed lion, but to the right of the entrance opening flanked by pentagonal salients the carving is purely floral in deference to the adjoining mosque in the interior which has been identified by its semicircular niche.

The base of the supports of the grand audience hall at Mshatta enables us to recognize a triple aisled basilica, leading to a dome chamber with a terminal apse and two other flanking apses at right angles which were canopied by semicircular half domes (figure 6). Recent excavation in the Dar al-Imara, adjoining the Kufa Mosque, has revealed a similar disposition of a triple aisled hall leading to a domed chamber with a door in each side. This palace is the earliest Islamic one so far discovered, having been built by the Arab commander-in-chief Saad ibn Abu Waqqas in AD 638.103 But the feature of the triple apse is absent, and for the combination of a basilica with the triple apse as at Mshatta we have to look to the monasteries of Coptic Egypt for prototypes. At Mshatta the apses together with the vaults and arches are of brick whereas the substructure of the enclosure and of the interior are of smooth cut stone. Brick vaults are employed in the four self-contained suites of rooms lighted by oculus windows which are situated in pairs on either side of the audience hall and having their own oblong courts. These may have been intended one for each family of the Caliph’s harem, for we actually know of a later Muslim ruler assigning each of the courts of his palace to one of his favourite ladies.104 At Mshatta the arches are markedly pointed and were strengthened by stone lintels, and though these are missing for the most part they may have resembled the carved lintels at the Omayyad palace of Qasr at-Tuba of the same date in the near vicinity. Such stone lintels strengthening brick arches derive from Byzantine Syria where they are found for example at Bosra (529) and Qasr ibn Wardan (564).105

Let us leave these secular buildings of which there are many other minor ones in an advanced stage of ruin,106 and retrace our steps. Fifty years had elapsed since the conquest of Syria, and in these years the Arabs had become painfully aware of their inferiority in the arts of peace as compared with their alien subjects. It was not fitting that the conquerors should worship in improvised shrines while the vanquished should exult in the glory of their churches. Abdal Malik pondered upon their problem. When a rival of the Omayyads, Ibn al-Zubair (d. 692) occupied Mecca he struck upon a plan to divert Pilgrimage traffic from the Holy City. Jerusalem itself had an enclosure sacred to Islam, and he felt he could persuade the Syrians to perform the Pilgrimage there so long as Mecca remained in the hands of the enemy.107 At the same time he would avail himself of the opportunity to build a magnificent reliquary in the enclosure to eclipse the finest buildings of his Christian subjects (as Muqaddasi expressly states). Some idea of how well he succeeded may be gained from Muqaddasi’s claim;108 ‘Never have I heard tell of anything built in pagan times that could rival in grace this Dome of the Rock’.

The rough and unhewn limestone rock in question had a long historical past though much was undoubtedly steeped in legend. Here on the summit of Mt. Moriah, according to Jewish lore, Moses had placed the Ark of the Covenant, David
had built his altar and Solomon his famous Temple (951 BC) of which detailed descriptions are available through the Old Testament. Opinion is divided as to whether the Rock was then the position of the shrine (debir), which is the traditional view founded on religious texts, or whether, as some modern archaeologists aver, it represented the position of the altar for burnt offerings. At any rate there is a cave beneath the Rock approached by steps (where there is an early mihrab, PLATE 9), and the popular description of this or the seemingly hollow region beneath as the 'well of souls', Bir al arwah, where the souls of the departed are believed to assemble, seems to be a pagan reminiscence of a ritual entrance to the underworld connected with a chthonic cult.

Nebuchadnezzar had destroyed Solomon's Temple in 586 BC but the Israelites had rebuilt it after their Babylonian exile c. 520 BC. Once more it was demolished by Antinous and rebuilt by Herod (20–19 BC). It was of this building that Jesus prophesied not 'one stone would be left standing upon another', and then along came the vandals Titus AD 70 and razed it to the ground. From here according to the legend Muhammad (PBUH) had made his allegorical ascent into the Seven Heavens to interview his predecessors. Since then Muslim legends had further warmed to the task and had come to regard the spot as the very hub of the Universe from which the trumpet blast of Heaven would fill the earth on the Day of Recompense. And it was described with touching accuracy as '18 miles nearer heaven than any other place in the world'!

The domed rotunda that was built as a reliquary between 688–691 comes down to us today with insignificant changes (PLATE 10). As you approach it you still see the octagonal substructure engaged with blind arcades and a sloping roof leading to the high cylindrical drum. The prim grey lead-sheeted wood dome of 66 feet diameter was, we know, once covered with gilt plates, and in the restoration of 1961 this condition was simulated in modern materials. There are really two layers of dome: the outer protecting layer, and the inner ceiling serving to carry the applied decoration. The two are braced independently each with a framework of timber ribs which converge at the summit and in between is an air-space large enough to allow a man to enter, no doubt to facilitate construction and repair. This dome rests directly on the drum and the whole is carried by a circular arcade. The plan can be followed best from an isometric diagram (FIGURE 7). Encircling the bare Rock is the ring of arched supports. But the sloping roof is supported on another outer ring of columns, this time arranged octagonally. The latter is parallel to the outermost octagonal walls. The two concentric rings of support therefore form a double ambulatory. And if on entering through one of the four doors we follow the pilgrims in their circling round we sense the more rapid rhythm of the inner circle whose every third column is interrupted by a rectangular pier. The Greeks and Romans had round temples and the Dome of the Rock goes back to them through a chain of mausolea, baptisteries, and shrines. The geometric system by which the plan has been set out is claimed to have been employed in essentially this manner in the Mausoleum of Diocletian at Spalato (AD 303). From this time on the architects of Islam inherited something of the mathematical bias of their predecessors, and a writer like Ibn Khaldun speaks of geometry as a prerequisite for the practice of architecture, adding that the theory of conic sections would serve in good stead in carpentry as well, while a knowledge of the laws of proportion would go a long way toward creating perfect forms. We know at least in one instance that this was no mere theorizing for one Muhammad b. Abdal Karim al-muhandis (d. 1202/3) actually studied Euclid to help with carpentry, and then the Almagest, and he it is who is said to have made the doors of the Hospital of Nuraddin in Damascus. There was a practical manual on applied geometry by the mathematician al-Buzjani (940–98) for the use of craftsmen in Baghdad. Later in 1423, the Persian writer Ghiyasuddin Kashi wrote his treatise, 'Key to Arithmetic', and applied it to problems of architecture, including the setting out of arched façades, and established their geometric properties by means of tables. The mathematical discipline had long been an important attribute of architects. Procopius for instance had described the builder of the greatest Church in Eastern Christendom as 'by far the wisest in the art called mathematics'.
decorative enrichment—the timber tie rods with festooned edges encased in sheets of bronze with gilt raised designs on a dark ground (some representing vines and therefore recalling the 'golden vines' in the old Jewish Temple on this site: I Macc, iv. 57), the polychrome marble panelling of piers and walls, the porphyry and verde antico columns, the gilt Corinthian capitals, and the mosaic tesserae of blue, green, and gold. By Muslim standards the mosaics representing sprouting acanthus bracts and counterposed spirals thickened by nodules are noticeable shaggy and overgrown\textsuperscript{20}—that is, not only are the excesses and irregularities of nature copied to some extent, but an attempt has been made to portray depth by means of highlight and shade. But on the whole in the rigid palms with hanging clusters of date, the trim trees with orderly trunks, the long garlands of grape and pomegranate, and in the vases and baskets of fruit, there is a more definite step in the direction of stylization. Some of the fruits, rosettes, and cornucopias are inset with mother-of-pearl, and one category of design consists of jewellery such as diadems with pendants, necklaces, and crescent-shaped earrings. The mosaics are no doubt the work of local or Byzantine artisans who had already begun to expand and modify their Hellenistic legacy. The often cited tradition, that the Omayyad Caliphs threatened the Byzantine emperors with destruction of churches and invasion of Asia Minor (Constantinople was actually besieged in 717–18) if they failed to send their best builders and decorators, may or may not be authentic (and a recent analysis of the sources\textsuperscript{21} has shown that there is no justification for doubting the veracity of Arab accounts\textsuperscript{22}, but at any rate it expresses a truth long ago realized by Ibn Khaldun, the great sociologist-historian (1332–1406), who says: 'When an Empire is in the first stages of its

\textbf{Figure 7} Jerusalem, Dome of the Rock (Choisy)

Of course the perfect geometrical clarity of the Dome of the Rock on plan does not guarantee its visual beauty in three dimension. The fenced-off intraversable centre space regrettably mars the cross vista, while the tie rods that pass above the pulvin from arch to arch hinder the spatial motion. Finally the well of the dome recedes into a deep shade.

Let us not pretend that the appeal of the Dome of the Rock is purely intellectual. The blue enamelled tiles encasing the panelled exterior, and the stucco painted designs held together by a palm fibre backing and nailed to the canopy of the dome, need not be considered here as the facade was refaced in 1552 by the Ottoman Sultan Sulaiman, while the dome was rebuilt by the Fatimid az-Zahir in 1022 and redecorated within in 1318 by the Mamluk an-Nasir Muhammad. But even neglecting these the interior is a triumph of
existence and still manifests the coarseness of nomadic life, the architects and craftsmen have to be invited from abroad.'

Just off the Haram-as-Sharif area in whose centre lies the Dome of the Rock, the Caliph Omar had pointed out a site for a mosque. What this first mosque of al-Aqsa built in Palestine in 641 looked like is not known, but the pilgrim Arculf says (AD 670) that it was capable of holding 3000 men, and that it was crudely constructed simply by means of beams and planks set on ruins (perhaps on the Stoa or portico of Herod). The Mosque was rebuilt by al-Walid about the year 710, but again little is known of it save that it was possibly a basilica with arcades traversing toward the qibla. There could not have been many aisles since Muqaddasi writes in 985 that the Abbasid Caliph al-Mahdi complained about its narrowness and extreme length and ordered that the one dimension should be extended and the other curtailed. Certainly the horizontal extension more adequately expressed the standing shoulder to shoulder of Muslims at prayer. Al-Mahdi's restored Mosque (780) had 15 aisles, each aisle opening on the façade by a door. We can also gather that each of these was covered by a triangular roof of wood sheathed with lead, and that the central nave rose above the height of the rest, a feature which long antedates the Christian basilica and is found for instance in the Festal Hall of Thothmes at Karnak. The present nave which is also wider than the aisles dates from the Egyptian Caliph az-Zahir's rebuilding in 1035 (as was seen from the inscription in glass mosaic on the dome bearing arches), though the carved botanical panels in the wooden ceiling now removed are acknowledged to have been preserved from the older building. They display a wealth of Syrian-Coptic motifs here interpreted with fresh exuberance. There are conches in the tympani of arched horseshoe frames, naturalistically treated acanthus in ovulate medallions or braided straps, vine stems completing double circles and sprouting baskets and chalices through which flamelike leaves or pomegranates or bunches of grapes are hung; while scrolling meanders and horn-shaped cornucopia are all enlisted in organically connected symmetrical designs. From letters in the Greek language written on papyrus by Arab governors to the village of Aphroditos in Egypt we know that skilled workmen had been procured from there for building the Mosque in Jerusalem, and one such request is actually dated 715.124

The last bay but one of the Aqsa nave, was more than likely domed in the 8th century (Plate II), as domes had been employed in the ecclesiastical architecture of Syria for at least three centuries, and it is possible to count over 50 churches which 'were, or should have been domical.'125 Moreover, Abdal Malik's brother Abdal Aziz is known to have built a golden dome on his vast palace called Madinat (the city) at Fustat in Egypt, according to Maqrizi (t. 334). From the domed bay situated in the focal centre of the Aqsa cross arcades led off toward either side and conveyed the thrust of the dome to the perimeter walls. The introduction of this transept resulted in a more-or-less T-form plan.

It goes without saying that the highly stilted pointed arches rising from antique capitals at the Aqsa Mosque belong to a period contemporary with or later than that of al-Walid,126 for the simple reason that no true pointed arches existed up to that time in any part of the world. The possible exception to this is the church of Qasr ibn Wardan (564), built of square bricks held by thick mortar (as in the contemporary Santa Sophia), and where the arches have a microscopic and probably unintentional point. Three-quarters of a century after the Prophet's death the pointed arch began to make a general appearance in the architecture of Islam, and as such it was the first radical departure from the forms of the past. Following up a suggestion of Gertrude Bell,127 Creswell has tabulated the earliest extant examples128 and has shown with precision how the semicircular arch drawn from one centre separates into two centres, at first with hesitancy, but growing progressively bolder until the separation measuring one tenth the total span of arch (Damascus and Quseir Amra) grows into one fifth the span (Mshatta) after thirty-five years. This is the quint-point arch which becomes the favourite of Gothic Europe over three centuries later. It seems however to have escaped notice that the first 2-centered arches in Muslim architecture are in the Dome of the Rock, where they occur in the intermediate octagonal arcade.
The sacredness of Jerusalem in the Muslim tradition was the main reason the Omayyads built their earliest monuments there. But now that their Empire had far outgrown its own design, it was time to turn their attention to their capital. Up to this time the Muslims had cramped themselves by sharing the pagan temenos area in Damascus, part of which was already occupied by the church of St. John, having been converted from a temple by Theodosius in AD 379. Since it was necessary to have at least one enormous mosque for Friday prayers in which the Caliph himself delivered the sermon following the Prophet's example, al-Walid took the initiative. When his offer of compensation was turned down by the Christian ecclesiastics, he appropriated the church, demolished it, and entirely employing the 1st century perimeter walls of the temple of Jupiter (of which the triple entrance on the south survives together with an interpolated Christian inscription) and its four square corner towers, one of which still exists today, commenced building a mosque which was 170 yards long and 110 yards wide.

Looking towards the western portico of the Great Mosque of Damascus, which is the best preserved and least restored portion of the edifice, one cannot help being impressed by the rhythmic alternation of piers and columns with a range of arcaded voids above. With a small stretch of the imagination one can picture instead of these the cross-country Roman aqueducts of Nîmes and Segovia carrying their precious streams of water to the towns. If the Roman influence is possibly suggested here, the question remains: is the Christian influence present on the far more important southern side? For here are three parallel aisles basilica-fashion running East and West. Supposing the Christians triple-aisled scheme was appropriated, which they themselves had derived from Roman prototypes, (the Arabs even took their word balaat 'portico' or 'colonnaded gallery' from the Roman palatium), the Muslims still had to have their qibla on the South instead of on the East. This difficulty was overcome by stopping the arcades short at a halfway point, and by making a direct passage from the court across the three aisles to the qibla wall. This nave in the desired direction was of course the transept. Of its three bays, the middle one was certainly covered by a dome as is the case at present. This high dome with the aisles to the right and left of it bore a diagramatic resemblance to an eagle with outstretched wings, and was therefore (whether mistakenly or not) called by the Arabs 'the dome of the eagle' (FIGURE 8). Dividing the two wings in the centre was a gabled entrance block with triple arched openings flanked by buttresses. The real pre-eminence of the Mosque of Damascus is in the novel feature of its plan (Christian churches are disposed longitudinally and never open up a whole flank on the court), and in its employment of faintly pointed arches (e.g., in the court end of the transept) and originally also of round horseshoe arches both of which enjoyed such long histories hereafter. As Muslim art has since the very beginning been preoccupied with aesthetic considerations rather than mechanical, it is not to any structural obligation that we should attribute this invention. Already there was the germ of the desire to make buildings look light and airy. The timber ceiling is raised to the lofty and dignified height of nearly 50 feet, not only by means of tall columns, but also by standing these columns on pedestal bases, by inserting impost blocks above the capitals, and finally by stiling the arches.

**Figure 8** Damascus, Omayyad Mosque (A.F. Briggs)
themselves. Moreover the wall area above the bearing arcades is pierced with continuous runs of arched voids in order to reduce the load of the wall; wherever there are superposed arcades on miniature columns, they may be ignored, as they are due to a false restoration.

It would have been an insuperable task to find marble columns of the length desired to avoid all these subterfuges. Instead the Arabs took the easier course of pilfering antique columns from older shrines.\textsuperscript{133} This charge should not be levelled against the Arabs alone, since the fact remains that ‘the use of secondhand material....(had become) the dominating character of early Christian art’, and was merely the perpetuation of an ‘evil example’ set by the pagans themselves.\textsuperscript{134} Reverence for archaeology is, after all, a relatively modern virtue. Early historians rarely show troubled consciences or deplore this practice as some later ones deplore vandalism. At his Mosque in Bosra dated 720-1, for example, Yazid II employed material from a building that at that time had long since fulfilled its function. This is evident from the Greek and Latin inscriptions on columns, one naming Balbus the Governor of the Province of Arabia at the beginning of the 3rd century AD.\textsuperscript{135} It must also be remembered that there were tens of thousands of converts who saw no purpose in letting the churches of their late religion lie fallow. Nevertheless, aside from occasional intransigencies Arab rulers sedulously honoured the private property of their minority subjects, since once these had signed ‘the Pact of Allah’ they had at the same time been guaranteed ‘the Prophet’s Protection.’ For example, in his treaty with Jerusalem Omar gave the inhabitants security for their lives, property, churches, and crosses, and made provision that their churches should not be used as dwellings or be destroyed.\textsuperscript{136} At Hims after making similar safeguards he set apart only a quarter of the church of St. John as a mosque.\textsuperscript{137}

The earliest mosques may have marked the direction of the qibla by means of spears stuck in the ground,\textsuperscript{138} known as anaza. Ibn al-Jawazi reports that Omar ibn Abd al-Aziz stepped down from the minbar and performed the prayer facing a lance.\textsuperscript{139} It was this same Omar who, according to Ibn Duqmāq (d. 1388), al-Maqrizi (d. 1442), Ibn Taghibirdi (d. 1456), and as-Suyuti (d. 1505) all ultimately dependent on the Chronicle of al-Kindi (d. 924), introduced for the first time the mihrab in the form of a niche at the Omayyad Mosque of Medina. The Great Mosque of Damascus itself acquired such a concave mihrab. Here it was not only a sort of compass with the magnetic needle pointing qibla-wise, but a kind of glorified signpost to Arabia apparelled to capture and hold the attention. In this final shape the mihrab niche had appeared, as we have said, in al-Walid’s restoration through his governor Omar of the Medina Mosque in 709. The hypothesis that Christian craftsmen were responsible for it there is strengthened by the fact that some people either forbade its use, or emphasized that it was by no means a holy part like the apse in a church.\textsuperscript{140} The Copts, however, cannot be credited with the invention of this semicircular feature as a prayer niche, since in recent years a shell fluted concave niche has been discovered in a synagogue dating from AD 245, at Dura-Europos,\textsuperscript{141} which served both as a point of orientation for worshippers at prayer and as a respository for the scroll chest.\textsuperscript{142} The form of this Torah shrine much reduced in size might well derive from the semicircular shell niche apse in Roman Syria where, for example, in the Temple of Tyche or Fortune (AD 191) at Is Sanamen the statue of the goddess was canopied by this feature.\textsuperscript{143} Caution, however, must be exercised in forming any definite conclusion since in Arabia itself at the Sabean temple of Sirwah we have a niche of rectangular plan exactly in the place we would later expect to find the mihrab.\textsuperscript{144} Not long ago many fanciful theories were rife concerning the origin of the concave mihrab among them the prow of the caique and the jogging head of the camel both affirming their destination, the opening in a tent with the light streaming in, a diminished apse, and even the cupped hands of a devotee in an attitude of prayer. But the subtleties of such theories were by no means exhausted. For example, one could offer the following train of reasoning—the niche as a recess in the wall has always served to shelter idols. God is the idol that men dare not represent. Thus the empty niche remains a constant pointer to His invisibility and a symbol toward which all things converge. One of the most
concrete imageries of God in the Quran is after all that of a Lamp in a Niche (xxiv 35). If the Copts really introduced the concave mihrab, Muslims may have quelled their doubts by observing the complete correspondence of the imagery to the translated fact. Let us leave such fancies and return once more to the Mosque of Damascus which was built between AD 706 and 715. To find it there at all is a matter of some surprise, for after Timur's troops started a fire in 1401 the lead on the roof melted and the ceiling collapsed, marble was splintered, gates burnt, the eastern minaret utterly reduced, and only the walls were left standing. And in recent times the greater part of the sanctuary was so hideously charred in a fire that in spite of, or because of, the renovation the visitor cannot repress a feeling of considerable disappointment. He finds it hard to imagine that an eye witness who saw it originally thought it 'so grand as to beggar description.' And if this is hyperbole there must be some small truth to the claim that seven years of land tax (or the equivalent of over five million sterling) and eighteen mule loads of silver and gold helped defray the expenses. When the mule train arrived laden with papyri accounts the Caliph calmly waved them away—he did not want to be bothered with such trifles as the £2000 worth of cabbages consumed by the workmen. We can only surmise how the Great Mosque appeared with its cupola surmounted by a gilt orange and pomegranate finial, its doors covered with gilt plates, its walls appareled with coloured marble panelling up to twice the height of a man, and above this the shining new mosaics over every available space within the sanctuary, on the court façade, and on both sides of the battlements on the outer walls. At least we know from photographs taken before the fire of 1893 that all the windows of the court façade as well as the tympanum of arches were covered with marble or stucco grilles forming geometrical interlaces. These, therefore, were the earliest examples of their kind in Islamic art. A few grilles of carved marble survive in situ in the windows of the vestibule under the west arcade. The admirable glass mosaics brought to light in 1928 are also on the west side. They depict gay pagoda-pavilions with keen projecting eaves, a hemicyclical building with colonnades, houses piled up on each other and dangling against the sky, and enormous trees with trained boughs and graded foliage (Plate 12). Here indeed town and country mingle in a delightful way though there is not a soul in sight.

The prominent Minaret of the Bride in the centre of the north side may have been there at the time or at least by the 10th century, but the present square shaft dates from the 13th century judging from its high double windows in a sunken frame. The lugubrious accretions above its gallery level were obviously later still. But we do know that the ancient square shafts on the four corners of the temenos walls which Ibn al-Faqih describes as being 'watch towers in Greek days' had been re-utilized as minarets. Tower shafts of square plan had of course been prevalent in Syria long before the Christians adapted them to their churches in that land. With their adoption in Muslim architecture the practice of calling lustily simply from a high roof top gradually became an outmoded practice. The Omayyad poet Farazdak (c. 640-732) still speaks of the call to prayer being pronounced 'on the wall of every city.' It was under the Caliphate of Muawiya that minarets began to be built for we are told by Baladhuri that Ziyad Ibn Abih added one to the Basra Mosque, and we also know that orders were given to Maslama to construct four sawami for the adhaan at the four corners of the Amr Mosque in Egypt in 673. None of these minarets survives, so that the credit for being one of the oldest surviving minarets must go to that of Kairouan. Sidi Ukba had conquered the North African province of Tunisia in 675, and though he founded the Mosque in Kairouan that still goes by his name, the present minaret dates from half a century later (c. 724, Plate 13), from about the time in fact that Hisham (724-43) built a beautiful minaret at Ramla according to Muqaddasi (c. 985). Like the Minaret of the Bride, this one at Kairouan is situated on the centre of the side opposite the sanctuary. Its shaft is square in plan, slightly tapering in length and massive in bulk—an effect heightened by its deliberately small entrance void. Above its reused lintel slab covered with Roman carvings is a relieving horseshoe arch, and this
latter is repeated each time a window is introduced for lighting the interior staircase. The device of built-in arches reducing the load on lintels may have been borrowed by the Romans from Egyptian mastabas. Following the main shaft of the Kairouan minaret are two successively diminishing superstructures crested with pierced battlements—the uppermost stage being crowned by a fluted cupola of a later age. The height of the whole is less than a hundred feet, and its aspect is remarkably like that of a lighthouse. Indeed, the Arabic word *manaara* from which the word minaret is derived means precisely that. The manar of Susa (859) with its two stages of square plan, one growing out of the other, is still used as such. The other Arabic words for minaret are *madhana*, meaning place for announcing the *adhaan* or call to prayer, and *saumaa*, a name particularly designating hermit towers, and more popularly used in Western Islam. Yet another type of tower survives from early Islamic times in Tunisia. This is the high watch tower of the Ribat at Susa, a two storey fortified monastery for ardent Muslim fighters for their faith. The Ribat was built under the Governor Yazid bin Hatim in 771, and the tower added to it by Ziyadat Allah I in 821, though the Ribat of Monastir already had its watch tower when constructed in 796.

The Mosque of Kairouan combines the plans of Damascus and Jerusalem. Seventeen aisles run toward Mecca and halt before reaching the last bay, and this residual space is covered by a cross aisle. The result is quite emphatically a T-form plan. These together with the sanctuary wall date from the rebuilding in 836 by Ziyadat Allah of the Aghlabid dynasty, though two more bays were added in a northerly direction toward the end of the 9th century by Ibrahim. The latter open out on the court façade in an adroitly composed screen of horseshoe arches linked together by a horizontal moulding (Plate 14). The coupled columns that separate these enframed repeating arches restored in 1294 give the illusion of being supported by them, but in fact the load of the wall and thrust of the arches is taken up by rectilinear piers set obsequiously behind the columns.

As we wander through palmgrove aisles of the Mosque at Kairouan we are struck by the same reaching up for height as we have encountered before. The interior of the Mosque was so far removed from the sunlight that a high ceiling was absolutely necessary apart from the monumentality and aeration that would be thereby enhanced. This must indeed have been a factor for consideration since Muqaddasi expressly criticizes a mosque near Baghdad for being deficient in light and air.

The horseshoe arch appears in the 9th century portions of the Kairouan Mosque. Several instances of round horseshoe arches used structurally occur in Syrian churches from the 3rd to 6th centuries, and it has been contended that they had a direct influence on scattered Italian examples built over a slightly later span of years. Prior to the 9th century in Southern France and Spain, horseshoe arches occur almost exclusively in carved relief slabs or stelae, once again due to Eastern influence. After the 9th century they are employed structurally in Spanish churches and decoratively in French manuscripts, but it was left to Western Islam and particularly to Moorish Spain to revel in it boldly. In Tunisia we also encounter the horseshoe arch at Susa in the triple-arched portico of the little Aghlabid Mosque of Bu Fatata (838–41). The triple arch theme is continued in the interior, and three barrel vaults run across three bays to the qibla wall, the vaults strengthened by transverse arches resting toward the centre on four cruciform piers. Such horseshoe arches and tunnel vaults running toward the qibla recur in the Friday Mosque of Susa built by the Aghlabid ruler Abul Abbas in 850, but this naturally has a larger prayer hall (thirteen aisles) as well as a courtyard with circumscribed portico on whose façade runs a bold Kufic inscription. One of the two domes on the nave is original and has a tympanum carved with patterns within trellises.

The problem of stresses and strains appears to have troubled Kairouan architects no end. Not only did they grid the arches together with tierods, but in complete disregard of propriety cluttered the external wall with any number of sidling dumpy buttresses often with cutback tops. True, many of these were added in after years, but in any case the exterior cannot have been of much account from the very beginning. The only outstanding feature is the melon rind dome over the mihrab (Plate 15).
From the courtyard this dome is nowhere visible because the view is obstructed by the eight arched bays that precede it.

The dome over the head of the central aisle facing the court is probably a 13th century restoration, but the dome above the lustre tile mihrab is the original one built in 862 by Ahmad the Aghlabid Prince. Since it is the oldest surviving dome in Muslim architecture after that of Quseir Amra, Hammam as-Sarah, and Susa, we are driven to enquire how the challenging problem of placing a round dome on a square bay has been met in this instance. But we must note in passing that Islam had arrived too late in history to invent either the squinch niche or the spherical triangle pendente. The latter had been used by the Romans in Italy and in Syria by the 2nd century AD. The squinch niche was an invention of the Sassanians and had appeared first in their domed palaces in southern Iran, where they may still be seen at Firuzabad and Sarvistan dating from the 3rd and 5th centuries AD, respectively. But while in these cases the squinches were simply inconspicuous niches, at Kairouan they perform their function as ingeniously and attractively as any (FIGURE 9). Across the tops of the four angles of the square chamber are placed the squinch hoods which are scalloped into shells simulating sunrays flaming out from a central navel. In the intervening wall space of the transition zone are panelled replicas of the shell outline, and this outline assumes a multifoil pattern. The shell and the multifoil, side by side, points suggestively to the derivation of the lobed arch from this natural motif. The circular drum of the dome which is pierced by hexafoil windows (anticipating the rose window of Gothic) could have fitted on to the eight-sided figure without much overlapping, but here the octagon is rounded out into a perfect circle by still other embryonic squinches placed just over the junction of the frame. Above this rise the scallops of the dome which converge at the zenith. The Romans had built domes with broad interior gores, and this tradition may have been inherited by the Byzantines who were familiar with the exterior melon rind in such churches as S. Sergius and Bacchus at Istanbul (536). Two years after Kairouan, that is in 864, the scalloped or melon rind dome appeared in a more robust fashion in the

Great Mosque at Tunis built by the architect Fath for the Abbasid Caliph Mostain. Again there rises above the roof a second dome over the bay of the central aisle next the court, evidently dated 911 (PLATE 16). It rests on a clerestory drum with recessed windows and framing arches whose voussoirs are alternately red and white, and the drum in turn rises from a square substructure.

Meanwhile, the venerable Mosque of Kairouan claims yet another feature which justly contributes to its fame. For here is conserved the oldest minbar or pulpit that has come down to us today. In essence it is only a rudimentary parapeted stair section sandwiched between panels of carved wood. There may have been a crested doorway originally, though the canopy with bulb finial or alternatively the high-peaked conical cap were later forms of the minbar. Not all minbars are of the immovable Kairouan type projecting into the
prayer hall, for there is evidence of another portable type on wheels (there was, for instance, one in the Great Mosque of Cordova, 966–76) which could be removed or pushed back into a recess in the qibla wall to the right of the mihrab when not in use. The Kairouan minbar was already a far cry from the chair of tamarisk consisting of two steps and a seat, flanked by arm rests with wooden apple finials, on which Muhammad (رضي الله عنه) sat for civic receptions or while delivering his orations. The quaint tradition that each of the four orthodox Caliphs delivered his sermon (khutba) one step below his predecessor out of sheer deference until an arbitrary height had to be fixed, reveals something of the kind of men who were Companions of the Prophet. After them the Prophet’s chair of 629 is known to have been set on an understructure of six steps by the Omayyad Marwan while he was governor of Mecca between 661–9. The crude beginnings of the pulpits point to its evolution from ritual needs, and any resemblance with Hebrew or Christian versions suggests that each had arrived at the only conceivable solution either independently or from each other because it was already incipient in their minds (this despite the fact that an early minbar at the Mosque of Amr in Cairo was said to have been erected by a Christian carpenter Victor of Dendra, sent by Zacharias the King of Nubia). Moreover, until the end of the Omayyad period each new Caliph’s reign was inaugurated from the minbar as if it were a throne from which both the secular and spiritual authority could legitimately issue.

Other than the pulpit there was no need for elaborate church paraphernalia—no need of stalls, or choirs, or organ lofts, or pews, or lady chapels, or altar shrines. No object intervened between the worshipper and the deity—certainly not a salaried clergy at that time. When the Caliph or Governor was absent the most learned man in the Law (usually the kadhi or judge) presided at prayer. When he had given the sermon (khutba) he would step down from the podium and take his station by the side of the others. It was only the danger of assassination that led to the introduction of a maqsura screen, a feature introduced either by Muawiya in 665 as Tabari and Maqrizi report, or by Marwan, governor of Medina, who, according to Baladhuri, built a maqsura of dressed stone with window when an attempt had been made on his life in the year 44 of the Hijra (i.e., 664 AD). According to Ibn Khaldun (II, 62) the maqsura later remained as a custom distinguishing the ruler from the rest of the people during prayer. He refers to its widespread use in the West as in the Spanish taifas after the fall of the Omayyads, in Fatimid Egypt, and in Aghlabid Kairouan. In fact it is in the Great Mosque at Kairouan that the earliest maqsura survives (for all too often these were lattices of timber and therefore vulnerable to fires) though it is not regarded as Aghlabid but as dating from the 11th century.

The surrounds of the Kairouan mihrab are inset with square up-ended tiles, which were imported from Baghdad in 862. They are glazed and painted in gold with multicoloured reflections. Of unusual interest among the motifs here are the paired laminae suggestive of wings. They are either shaped into curving cones or their tips are twirled. Their bases are either free or are jointed to a stem, while interstices are filled with cross-hatches, dice cubes, four-petalled flowers, curvilinear leaves, chequers, scales, and dotted circles. The concave back of this mihrab is faced with oblong compartments of marble pierced in deep relief with half or whole symmetrically disposed palmettes jointed by scrolling stems or divided by a grid. The wooden slabs of the Kairouan minbar are also known to have been imported unassembled from Baghdad together with the tiles. Apart from vine leaves and bunches of grapes connected by convoluting tendrils, and paired palmettes and pinecones combined with skilful diversity, there are such geometrical figures as staggered crosses, stepped concentric or interpenetrating squares, joined swastikas, overlapping quatrefoils, polygonal medallions, braided interlaces, intersecting semicircles, some of them contained within arches, others within quadrilateral frames.

The lustre revetment at Kairouan though imported is of earlier date than anything so far found in the east, and the same may be said of the lustre and monochrome tiles excavated at the Qala of the Beni Hammad in the Algerian desert, for these are in the form of eight-pointed stars fitted in mosaic fashion with spike-ended crosses. These must date from the 11th century, since the fortress
was founded in 1007 and abandoned in 1090 when the rulers emigrated to Bougie, though we have to assume that the type originated in the Middle East where it was popular later (while being virtually unknown in the West except in pottery). All this impels us to note the shift in architectural activity from Syria to Iraq.

The Omayyads had a creditable list of achievements to their name. Within the ninety years of their reign, they had flung the frontier of their Empire from the Indus to the Pyrenees. And in this span of years they had selected and laid down the themes on which the future architecture of Islam could be founded. Toward the end of their reign there was a sudden revulsion from architecture which made itself manifest in Yazid III’s inauguration speech in 743. Referring to the bad habits of his profligate predecessor Walid II he said, ‘People, I promise you not to put stone upon stone, nor brick upon brick, nor to dig out a canal, not to store up wealth.’ His successor Marwan II (744–50) could not have been similarly disposed for he removed his capital to Harran where he built the Great Mosque employing some of the remains of the old Sabian temple. The excavation of this mosque is incomplete but already the bases of four aisles parallel to the qibla may be seen, the one next to the court, with the great ovoid central arch still standing, added by Nuraddin (1146–74) and described by Ibn Jubayr in 1184, who also refers to massive rafters roofing the sanctuary. Standing also is the east wall with gables and an entrance whose horseshoe arch framed with a festoon contains an inscription of Saladin dated 1192. The polyfoil ablution basin excavated in the court may be of this time, but it is not yet certain whether the minaret of square plan, masonry below and brick above, belongs to Marwan, the last illfated Omayyad ruler, who commenced the mosque.

The Omayyads had not reckoned on the group of dissenters deriving from the sons of Ali whom Muawiyah had alienated. These schismatics inaugurated the sect of Shiism, and staged an insurrection at Kufa in 685–7 not long after the massacre of Husain and his followers at Karbala (680), and stubbornly continued to maintain that Ali’s progeny were the rightful heirs to the Caliphate because they were of the Prophet’s blood. This contention went down well with the Persian converts since they had always hankered after a divinely ordained succession of kings, and this for the time being was the nearest substitute for it. We should also take into account the fact that the unlettered Arabs soon came to admire the superior culture of their Persian subjects. They intermarried with them, and their sons became enchanted with the ceremonial court and dress of the Sassanians. Moreover, there was dissatisfaction at being a semi-neglected province in which few of the spoils of war were being invested. For all these reasons a conspiracy was formed, and the Omayyads were overthrown. The whole family was hounded out and destroyed almost overnight—with one exception. Of the youth who escaped we shall have more to tell in the next chapter.

The Abbasid dynasty commenced its rule in the year AD 750. It was at once apparent to al-Mansur that were he to adopt Damascus as his capital he would have to live among a potentially hostile people. And knowing also that his strongest allegiance would come from further East, he decided to put a 600 mile desert between himself and Syria. Still, the lawless fanaticism of the people of Kufa irritated him. The choice being limited, he decided to found a new city altogether. After a painstaking survey he selected a spot in the Tigris-Euphrates valley just north of the Sassanian capital of Ctesiphon. He chose it for its combined assets of irrigable land, freedom from the terrors of malaria, commercial centrality, and strategic isolation from East and West of the Empire. The 11th century writer al-Khattib says the Caliph sent for engineers, architects, and men skilled in the knowledge of measurement, surveying, and apportionment. When they were assembled he described to them the plan which he had conceived, and then brought from a distance artisans and craftsmen, carpenters, smiths, and diggers....Further, he wrote to every town (Tabari specifically mentions Damascus, Mosul, and Basra) giving instructions that any inhabitants who knew anything of building were to be sent to him. The ground plan was dug out, then filled with ashes covered with bales of cotton soaked in naphtha, and set alight, ‘so that the whole plan lay
revealed in lines of fire.’ Work was commenced on the new capital Baghdad after astrologers pronounced that the stars were favourable and Mansur himself had laid the first brick.\(^{170}\) He called his city Madinat al-Salaam (City of Peace), apparently in reference to the Paradise of the Quran (vi, 127; x, 26), though the place had already borne the name Bagdadu in neo-Babylonian times c. 500 bc.\(^{171}\)

In order to understand the full significance of what 100,000 labourers from Mesopotamia, Persia, Syria, and Arabia accomplished in four difficult years of toil (762–766),\(^{122}\) it might be best to imagine what a besieger would have to undertake to penetrate the city (FIGURE 10). From a distance he would see a 45 foot high mud brick wall making a perfect circle round the city. On approaching nearer he might observe that against such a massive wall (estimated by Herzfeld at about 15 feet thick at the base and stepped back twice till it was about 13 feet at the top), mining or battering with a ram would be by no means an easy task. He would then naturally head for one of the four square gate towers that interrupted the wall exactly on the four axial points of the circle (as the gates interrupting the railings of the Buddhist stupa). On observing further that the gate instead of having a frontal approach had an entrance in its left flank (as is evident from the description of al-Khatib) with the express purpose of breaking up his direct charge, he would then wheel and canter across the bridge straddling the water-filled moat provided it was not drawn. Immediately, on entry, he would have to rein his horse sharply to the left. This turning of the passage in the interior of the gateway once again broke up his momentum. He would then come clattering into a narrow open court hemmed in by walls on either side. Thirty yards ahead of him he would see the jaws of a larger and higher vaulted gateway. A volley of arrows would come streaking down through its domed upper chamber which was surmounted by an equestrian finial. There could be no question of scaling the inner wall which was about 60 feet high and defended by a succession of projecting half round towers at 60-yard intervals. Supposing he was accompanied by a sufficiently large storming party, he would have to get ten men to push open the enormously heavy reused iron gate—that is if it were conveniently unlocked. Having got thus far with the grace of God and not a little fantasy he would have to run the gauntlet of barracks, bazaars, rows of concentric dwellings, and other intermediate gateways under continuous fire before reaching the hub of the Round City. In this open stretch of land he would see the Green Domed \(^{173}\) Golden Gate Palace which adjoined the flat-roofed Mosque supported on wooden columns—the latter exactly a fourth of the size of the former. Now the only stratagem that might enable him to manoeuvre past the palace guards and into the Caliph’s seraglio would be Sindbad’s imagination. To put it bluntly, the Caliph had found a way in which he could be farthest away from his enemies,\(^{174}\) or, to put it as did al-Fakhri ‘so that none should be nearer to him than another.’ Vitruvius claims (Bk. i, dh. v, 2) that the purpose of laying out a town in circular form was to give a view of the enemy from many points. Ibn al-Fakih (903) at any rate holds that the round city is more perfect than the square city. Tabari is undoubtedly right when he says that al-Mansur made four gates for Baghdad on the line of military camps, for we actually have a carved representation of an Assyrian military camp from Nineveh in which four axial gates open into a circular enclosure. The circular urban plan with concentric walls was by no means al-Mansur’s invention, but a type that dated into the misty past of Western Asia, and had been kept alive in such Sassanian cities as Firuzabad and Ctesiphon. Firuzabad is particularly reminiscent of Baghdad in the description of Ibn al-Balkhi (c. 1110) who says, ‘its ground plan is circular, even as though drawn with compasses,’ and goes on to speak of a mighty dome of kiln-burnt bricks resting on a masonry chamber which in turn rose on a platform in the centre of the circle and was surrounded by porticoes.\(^{175}\) The dome of Mansur’s own Palace which al-Khatib describes as ‘the Crown of Baghdad, the standard of the realm’ rose to a height of 120 feet. The revolving equestrian finial at its top must have symbolized the vigilant Caliph, since only he was permitted to enter the innermost circular enclosure mounted on horseback. The palace was 200 yards square, and there was an audience hall with a ceiling 30 feet
Baghdad was in its heyday under the rule of that pious night prowler Harun al Rahid. The Caliph wandered into the streets incognito, prying into the affairs of men, while scientists had free rein to make geodetic surveys of the earth, and translators revived the learning of the Greeks in Mamun's House of Wisdom (832). But the neat geometry of the city was not to endure very long. Under the siege engines of Mamun the walls collapsed and his usurping brother Amin came tumbling off the throne (814). In vain had Mansur named his city 'the City of Peace'. By the end of the 10th century, the elaborate fortifications had crumbled into the sediment from which they had been moulded. The rapidly expanding city could not be contained by a circle drawn from a mere one mile radius, although it was 6 miles in circumference. When the Spanish Jew, Benjamin of Tudela, visited the city in 1170 the perimeter was something like 20 miles. But size alone did not impress Ibn Jubayr who described it 14 years later as 'a washed out ruin like the statue of a ghost.' He complained of the insular-minded conceit of its inhabitants who continued to bask in their former glory. A greater nemesis lay in store for this ill-fated city.

Because of the complete disappearance of old Baghdad, we must study Abbasid architecture from surviving ruins elsewhere. Of these the so-called Palace of Ukhaider situated in the desert about 100 miles south-west of Baghdad is the most important preserved—that is to say, if it is an Abbasid building at all, for there is neither Arabic text nor inscription in situ to help us to establish this fact definitely. On architectural grounds there can be no doubt that it was built around the year AD 750, with a quarter of a century lee-way on either side. The indications that it may have been earlier than Baghdad are that such an obviously useful feature as the bent entrance is not made use of, a few of the arches are still semicircular, squinches are only made use of in half-domes whereas the scalloped dome is supported cruelly on corner slabs (it is inconceivable that the great domes of Baghdad rested on these), and finally the habit of dwelling in desert places was an Omayyad
one. Of the Omayyad Governors likely to have been its builder we may discount Hajjaj (695–713) who had his Kubbat al-Khadra at Wasit, and leave it open for possible later research to decide whether his successors Khalid ibn Abdallah (724–37) or Yusuf ibn Umar (737–44) might have had the opportunity to construct it. The Omayyad Caliph Hisham was at any rate jealous when he learned how wealthy the former was and how numerous were his houses and lands.\textsuperscript{176} If built in the first years of the Abbasid rule we can similarly eliminate the founder of the dynasty Caliph Saffah who lived in his palace beside the Persian city of Anbar (about 45 miles west of Baghdad) and died there in 754, and also al-Mansur who, before he founded his capital, lived in his palace between Kufa and the old Persian town of Hira. Two likely candidates have been proposed. The first that it was built by Mansur’s nephew Isa ibn Musa (d. 783/4) expelled from his governorship of Kufa in 778 and who had some years earlier renounced his claim to the Caliphate for which act he had received an enormous sum of money. On his expulsion he returned to his estates and, it is stated, used to visit Kufa once a week to say his prayers and then at once ride away.\textsuperscript{177} The only possible objection to this attribution is that the two-way journey of 200 kilometers from Ukhaider to Kufa through the desert could not have been an easy undertaking for a man who is known to have been a permanent invalid. The second identification of Ukhaider is with Qasr al-Muqatil of which Yaqut says that Mansur’s great uncle Isa ibn Ali ibn Abdullah rebuilt it after having demolished the pre-Islamic castle on the site. From Ibn al-Athir it is gathered that this palace was situated on the road from Kufa to Anbar, which takes us sufficiently close to Ukhaider.\textsuperscript{178} Here then we have direct evidence for a palace with the qualifications we are looking for: the timing is correct, the position on the map is not far out, isolation is suggested, and a man of such importance must have had the resources and what he hadn’t he made up for by employing building material for the most part already laid out for him.\textsuperscript{179}

In the curtain walls of Ukhaider which rise to a height of 55 feet arrowslits are served by the wall walk (once vaulted), and these arrowslits continue into the half-round towers which project outside at regular intervals (Figure 11). The wall of rough limestone slabs held by mortar is strengthened by a succession of blind built-in slightly pointed arches both within and without the wall. Three of the gateways, one in the centre of each side, are flanked by quarter round towers, while the main gateway on the north\textsuperscript{180} is distinguished by being a rectangular salient (Figure 12), but all have slits in their vault for dropping combustibles, as well as lateral grooves for letting down the portcullis. When Vegetius (\textit{de Re. Mil.}, iv. 4) designates the \textit{catacacta} or portcullis an ancient contrivance\textsuperscript{181} he is certainly right for we know now that it goes right back to the first dynasty in Egypt.\textsuperscript{182}

\textbf{Figure 11} Ukhaider, plan of fortified wall (Reuther)

The passage of the main gateway leads into a chamber covered by a fluted dome borne across the corners on flat slabs, and from here a barrel-vaulted corridor leads off on either flank and communicates with the open spaces between the curtain wall and that of the palace proper. Here horses may have been tethered and tents of the retainers pitched, and there is an annexe building possibly intended for the use of the latter. Continuing along the central axis from the domed chamber there is a large public reception hall rising to a height of 34 feet and covered in brick with a pointed barrel vault. Along the flanks of the long
Figure 12
Ukhaidar, plan of main entrance and palace complex (Reuther)

Figure 13 Ukhaidar, Court of Honour, restored view of north side (Reuther)
chamber are arched niches carried to the ground on round engaged columns, within which it is conceivable stood the palace guards during receptions. At the far end an arch opens into another domed chamber, and this in turn into the Court of Honour. Drawings based on careful examination of the ruins enable us to imagine its original appearance (FIGURE 13). Looking toward the north side of the court from which we have just emerged we see first the 20 foot high wall arcades on round engaged columns, above them a second storey block with blind pointed arches having cusped archivols, and rising still further above setback wall crowned by a parapet frieze of recessed niches, perhaps itself topped by stepped crenellations. The south side was dominated by a vaulted ivan now fallen, and presumed to have been framed by a rectangular frontispiece. This long chamber for private audience opened into what normally corresponds with the throne room four-square on plan with a door on the centre of each side. Taking the thrust of the ivan vault are lateral chambers, the pair on the right particularly notable and preserving their decoration. In one of these the vault is covered with narrow oversailing ridges of plaster forming a kind of corrugation, while along the peak are a set of concentric sunk coffers at intervals. The other room has four transverse arches, and these serve to carry small transverse barrel vaults as at Qasr Kharana (FIGURE 14). The resemblance with the latter does not end here since in both cases squinches are made to carry half-domes, arrowlits are treated externally in precisely the same way, and the entrance gate is flanked by quarter-round towers. In the chamber flanking the ivan at Ukhaidar the transverse vaults are fused into the side walls with semi-domes, and the head wall treated in an interesting manner with a sunk spear-shaped ornament set in the centre of each blind arched frame so that it is reminiscent of the anaza to which we have referred earlier. In the Mosque situated to the right of the main entrance, as at Mshatta, and identifiable by its mihrab niche (a half-domed head on a rectangular ground plan) a similar decorative scheme is applied on the sanctuary side of the court (FIGURE 15). The single
pointed barrel vault covering the hall and resting on the court side on stumpy cylindrical piers had a corrugated surface, and along the ridge were coffers of diverse shape. The ends of the vaults are fused to the side walls by means of fluted half-domes with squinches of the same form inserted at the transitions.

Some technical considerations may here be noted. Due to the difficulty of obtaining timber in the desert region barrel vaults may have been built without support or centering. This could be achieved by the old system of laying the bricks in a succession of slanting rings which were supported on one end by a temporary buffer wall. The crown could support the weight of the mason providing a viscous mortar such as gypsum were employed. In modern Iran, however, vaults are supported on a light-weight scaffolding of boards, or on reeded plaster planks made to the desired form in moulds. Domes too were occasionally built without centering. We may cite the letter of Gregory to Amphilochius (between 379–94) requesting workmen who could build domes without centering since there was a shortage of wood in the region of Nyssa in Cappadocia.

Some of the arches at Ukhaidar must have been built by being impaled between flat centerings of reeded plaster, whereas others which have protruding ledges at the springing must have had wooden frames or templates of the desired arch outline stretched across. Another feature which we may observe at Ukhaidar, and which was to be encountered earlier at Parthian Hatra, is the insertion of tubal voids above the springing of vaults. These served to reduce the quantity of materials and the sheer overhead loads in vaults which were excessively thick, no doubt the better to resist seismic shocks, and at the same time to promise a cool interior. A few groined vaults (a certain hint of Syrian influence) were used at Ukhaidar at the intersection of tunnel vaults. Finally we may note that the masons of Ukhaidar have made a daring innovation and one which was to have a permanent consequence in Islamic architecture. In some of the concave tympani of the engaged arches in the Court of Honour they have used bricks in the form of mosaic and set them upright and sideways to form patterns, a technique later popularly described in Persian as hazarbaf, or ‘thousand twistings’.

The whole ceremonial court and its dependant chambers was isolated from the domestic rooms by a tunnel vaulted corridor completely circumscribing it. On either flank longitudinally lay a pair of self contained suites or bays in just such a manner as we have encountered at Mshatta. At Ukhaidar each of these four units was symmetrically treated, and comprised two sets of three adjacent barrel vaulted rooms confronted across an open court. In two of the suites, however, the rooms were prefaced by a triple arched portico and the resulting L-shaped plan has been traced back, not only to the Sassanian Palace of Qasr-i-Shirin (c. AD 600), but to the neo-Babylonian summer palace and Nabonidus’s palace at Ur. Further, the scheme of three adjacent rooms opening into a corridor or portico at right angles to them was anticipated in Roman and Byzantine houses in Syria, and as far away as Delos. The purpose of repeating the plan units in both north and south sides of the court at Ukhaidar was to take the most favourable advantage of the seasons, so that we may imagine they constituted the summer and winter quarters of the household.

Nowhere did early Muslim architecture show itself more fecund than in the invention of arch forms. Hardly a decade after the first pointed and horseshoe arches, the pointed horseshoe arch appeared in the fortified enclosure of Qasr al-Hair al-Sharqi. The Abbasids were quick to adopt the inventions of their predecessors. Harun al-Rashid in his Cistern at Ramla (789) in Palestine employed two-centred arches of future Gothic outline. The cistern consists of underground arcades on cruciform piers of masonry carrying six barrel vaults. These were strengthened by transverse ribs, and were pierced with overhead orifices for drawing water. The fact that the four-centred arch had appeared seventeen years earlier in Mansur’s defence post against the Byzantines on the Gate at Raqqa (772) indicates that this shape consisting of two arcs of short radius and two of large radius was probably evolved by Mesopotamian architects who were wavering between the high crowned ellipse of Persia and the new pointed form of Syria. It is a source of some
confusion that this low profiled arch with a sharp incurving at the spring is known somewhat complacently as the Tudor arch merely because it became popular about seven hundred years later in 15th century England. Multifoil arches also occur for the first time in Muslim architecture at Raqqa and Ukhaider, though still serving as a frame to a blind panel or a pointed arch. The façade of the Raqqa Gate is attractively conceived (Figure 16) Skirting the top of its entrance arch is a horizontal string-course of oblique header bricks, marking off the upper area which is ornamented with blind arched panels. These are niched out and separated by engaged columns while further above is yet another range of niches, this time with trefoil crowns. The backs of the niches and the tympanum of the arched recess to the left of the entrance are both treated with raised brick forming ribs, herringbones, and swastika repeats. Baladhuri (869) informs us that in 772 al-Mansur built ar-Rafqa beside Raqqa for his Khurassan troops, and that it had the ground plan of Baghdad.

With all the mastery of arch forms, the old system of building on lintels still continued to persist. It was in fact too deep-rooted in the Persian royalist tradition to be altogether given up. The tall flat-roofed *apadanas* and *talars* of Achaemenid kings surely influenced the reconstructed Mosque of Kufa, and later the Round City mosque of Baghdad. Moreover, it is believed that the Great Mosque of Samarra was also built without a single freestanding arch, but because of the removal of the fallen brickwork constituting the piers no direct evidence remains.

There were several reasons why Mamun's son Mutasim should have decided to quit Baghdad in 836, and found the new city of Samarra higher up the Tigris some 70 miles north of the capital. First of all Baghdad had already sustained enormous damage in the siege; then too the absorbing point of the Round City had long been reached. To add to that the mercenaries from Turkestan had become too many and too clamorous, and were decidedly unpopular with the local inhabitants. And last of all the prestige of a large and prosperous Empire demanded the founding of more than one city. Since all these were real and substantial causes, the contention that the Abbasids built to satisfy their whims cannot be sustained. Ibn Serapion (c. 902) says that al-Mutasim changed the ancient Persian name of the place, and for the sake of good augury called it *Surra man raa*, 'he who sees it rejoices'.

Yaqubi reports the Mutasim made a written order to bring together masons, smiths, carpenters and other artisans including papyrus makers from Egypt, glass workers from Basra, mat makers from Kufa, and potters and colourists from other countries. Wood, notably teak and plam trunks, was brought from lower Mesopotamia and the Syrian coast, and at Latakia and elsewhere workshops were established and specialists assembled for dressing and constructing in marble. According to Muqaddasi this Caliph also built near the town a square building resembling the Kaaba, and surrounded it with a walk for circumambulation (to induce his Amirs to perform the pilgrimage here). This building does not survive, but there is a ruin with octagonal exterior walls enclosing an ambulatory and a square mortuary chamber. This Qubbat ash-Sulaibiyah has been identified as the mausoleum built for the Caliph al-Muntasir (d. 862) by his Greek mother (Figure 17).

The scale on which Samarra was planned was never equalled again. The Great Mosque of Mutawakkil (848–52), for instance, completely dwarfed all the others that had been built either up
have been sequined with shining gold mosaics, which were excavated in the debris. The succession of half round buttress towers on the exterior stretched away into infinity, while the rhythm was kept in motion by a continuous frieze of shield-like recessed roundels serving as the parapet. It must have been a magnificent sight when the whole army was assembled there filling every inch of space around the great fountain in the court called Pharaoh’s Cup.  

In its present desolation only the helicoidal minaret tower (850) known as Malwiya breaks the monotony of the pancake desert scene (Plate 17). Attached by means of a ramp (now disappeared) to the centre of the north side like a telescope inverted on a square, its ramp goes spiralling round the exterior the slope becoming steeper as it ascends. There is certainly a suggestion of the old Mesopotamian staged temple tower, the ziggurat, but these were of square or rectangular plan and only in rare cases did the ramp go round the exterior in a continuous spiral (possibly at Khorsabad in Assyria; also Herodotus, 1. 181 does claim the same for that of Babylon). The tradition of such towers was revived momentarily by the Sassanians at Firuzabad in the 5th century AD.  

From the summit of Malwiya once covered with a cupola on columns, you could have seen an incredible length of built-up area all along the bank of the Tigris. And above on a high ground, the more than 400 acres that constituted the palace complex.
over 380 yards away you could just see
the salient portico of the Assembly Hall,
and a domed Throne Room with triple-
aisled basilical halls leading off on the
four cardinal points. To one side of these
was the Caliph's private apartments, and
to the other that of the Queen. An
underground passage connected the two.
Frescoes discovered in the harem reveal
an advanced coalescing of Syrian and
Sassanian styles. They portray plump
female attendants in kneeling postures or
dancing and pouring wine, as well as
parakeets, predatory eagles, and startled
hares, set amid the vigorous flourish of
cornucopia scrolls. There were also
friezes of rampant lions, oxen and stags,
and grouse, ducks, partridges with flying
good luck scarves, and everywhere
strewed diapers of hearts, scales, mesh,
chequers, and fleurons in gay rich
colours. Some of these paintings
including that of a gaunt Christian priest
were found under the pavement of a
room situated between the throne
chamber and the harem, and it now
appears that they were not painted on
picture columns but on wine jars, and
the names on them are not those of the painters
but of the wines and further that they were not
buried for fear of idolatry (for which a general had
been tried and condemned to death just then), but
simply because they were empty and had been
discarded. It must nevertheless be noted that the
compilers of the anti-image saying attributed to the
Prophet lived at this time, and it is known
from Masudi that Muhtadi (d. 870) ordered painted
figures to be effaced from his palace hall. The
principle aversion may have been to the paintings
representing the interior of a Christian church full
of monks in prayer, and the portraits of the chief
dignitaries of the Church which Mutawakkil had
demanded a Greek painter to execute in the palace
of Mukhtar. Apart from the paintings all the
chambers of the palace were adorned with
engraved plaster dadoes, carved marble cornices,
and panelled ceilings of gilt teakwood. Beyond
the resplendent apartments were baths, anterooms,

Figure 18 Samarra, the Great Mosque, window and reconstructed pier
(after Herzfeld)
and courts for the reception of eminent guests. Finally through a monumental triple-arched portico, the Bab al-amma, which served as an audience hall for the public, one emerged onto a terrace walled in on three sides and hanging high above the surrounding terrain (Plate 19). This is the only structure that survives in a fair state, and it is possible to see that its arches are for the second time of the four-centred variety, and once again with a double ring, the inner one of which is laid with the broad square side of the bricks facing out. The two barrel vaults of the lateral guard rooms are converted into half domes by means of squinch niches consisting of hemi-cylinders with simple concave hoods. Climaxing the plan a grand stairway led down to the edge of an immense ornamental lake surrounded by vineyards and fruit trees, a disposition which leads us to recall the Quranic promise that (xxv. 11) for whom God is pleased there will be castles and gardens beneath which rivers flow. All these lay along the principal axis running East and West, but the greater Palace enclosure contained the mansions of princes and ministers, as well as the treasury, the arsenal, ranges of barracks, watch towers, pavilions, and what was once believed to have been a classical amphitheatre, but the square excavation in the rock proves it to have been a serdab, and to have been purely for pleasure, perhaps where mock naval combats were held.203

Another palace built at Samarra, the Balkuwarra attributed to Mutawakkil c. 855, also aligned the buildings along a great symmetrical axis with three successive gates. Beyond these lay a complex of four courts surrounded by dwelling rooms, and separated by the cruciform plan of the vaulted audience hall. The dado of the great hall is covered with carved stucco in the slant-cut style, that is, the lines are drawn through plaster leaving the outer side to slope. The seemingly abstract spirals, scrolls, and countercurves are juxtaposed in a manner to produce in one case what can only be caricatured human figures in double rows (Figure 19). Above the wainscot are a series of deep square or quatrefoil storage shelves known in Persian as taqchas, here encompassed by chains of plaster beads punched to resemble pearls. At a private house excavated at Samarra the shelves are appropriately shaped like the double hump of camels (Figure 20). Stuccoes from other houses now at the Baghdad Museum indicate fanciful provocative shapes and of such diversity as almost to defy description.

The disposition of the audience halls in the palaces of Samarra are of particular interest as they place the throne of the Caliph under a domical room, toward which four vaulted halls converge from the four points of the compass. The meaning implied here of the monarch presiding over the four quarters of the universe is plainly evident, just as it is suggested in the Pharaonic Sed-festival or Jubilee in which the king sat four times in the thrones facing the cardinal points being proclaimed at each point of the compass and an arrow shot to each point.204 At the Jausaq, the cruciform halls were each of them triple aisled, while at the Balkuwarra, between the arms of the cruciform halls were eight rooms, each set disposed around a central court. The ultimate origins of the type are still obscure, though among the earliest known may be counted the four triple-aisled basilicas converging from four opposite directions at the church of St. Simeon Stylites at Kalat Siman (c. 460) in Syria, leaving a tall column in the centre on the top of which the saint had spent more than half of his life without descending. In Muslim architecture, the earliest of the type known with any certainty was the Government House of the
the treatment of the central part is the same (Figure 21). As we only have an aerial photograph of this unexcavated ruin, we do not know how the rooms were disposed between the angles of the cross, and for this purpose we may go to the approximately contemporary palace at Termez (now in the former USSR), which, like Hiraqla, is a cross inscribed within a square, whose angles are fortified by three-quarter round towers. At Termez long intramural corridors give access to five rooms in three of the angles, while a large hall, with its roof carried on a string of central piers, is contained in the fourth. The final manifestation of the type—at least until it became adapted to other uses than palaces in later centuries—is to be found at the palace at Huwaiisilat, north of Samarra (c. 840), where the shifting banks of the Tigris have done irreparable damage on one side. It has been identified as the Gypsum Palace of al-Mutasim which is referred to by Ibn Serapion in his Wonders of the Seven Regions. None of the superstructure survives, but the ground plan shows that while the four ivans do open up on four courts as at Merv, the central hall is preceded on all sides by a horizontally disposed ante-chamber, and this alteration changes the whole into what may be termed the eight-part plant which originated in Babylonia, and which was spectacularly developed by Islam in later years. Between the four axial courts were domestic and bath complexes, each self-contained with several rooms and private entrances. (One of the houses excavated at Samarra has 13 courts and 150 rooms.) An enormous quantity of stucco revetment incised while the plaster was wet, and backed by a protective layer of bitumen, with the slabs held against the wall by means of nails, was also recovered from the palace at Huwaiisilat, and there were indications that these were not only employed on dadoes as were Assyrian orthostats, but also on door jambs and elsewhere.

Persian general Abu Muslim at Merv (750–55), and according to Istakhri the cruciform arms, with domed throne room in the centre, each led out directly into a court. At Harun al-Rashid’s frontier palace at Hiraqla (806–8), near Raqqa, instead of four independent courts the whole is contained within a circular enclosure, otherwise

**Figure 20**
Samarra, stucco dado and taqcha from house (E. Herzfeld)

**Figure 21**
Hiraqla, schematic plan of unexcavated palace
What a wealth of art must have perished due to the unfortunate use of mud brick. Thus not a sign of the outer walls of the Mosque of Abu Dulaf (860–61), in Mutawakkil's suburb al-Jafariya north of Samarra, is to be seen, whereas its interior pointed arcades which run toward the qibla and are cut off before the last bay by a transverse arcade, survive for no other reason than that they employ bricks which have been burnt in kilns. This is true too of the last of the palaces built at Samarra, the unexcavated Qasr al-Ashiq (Lovers' Castle) attributed to Mutamid (787–82). Its exterior walls are comparatively well preserved and anticipate two types of arches popular in later Islamic times (though not free-standing here), the erect trefoil and the multifoil, each enclosed within that feature ubiquitous hereafter—the rectangular frame (FIGURE 22). The multifoil arch had appeared already along the archivolt of the great iwan arch of the Sassanid Palace at Ctesiphon, and in the eastern branch of the Basilica of St. Simeon Stylites at Kalat Siman c. 460. The erect trefoil had appeared as a frame round the great standing Buddha in the rock face at Bamian north of Kabul in Afghanistan, as well as in the entrance of the Sun Temple of Martand in Kashmir (724–60). In 670, captive slaves from Kabul had built a mosque in Basra in their native style, and may therefore have been instrumental in bringing the feature to the West, or the Barmakids may have introduced it for they were originally aristocratic priests of Balkh and helped supervise the rebuilding of that city by the Arabs in 725.

We cannot help concluding that one of the reasons at least for the present dereliction of Samarra was simply that there was a lack of brushwood for the kilns. Being a boom town Samarra was naturally a refuge for subversive aliens and strange intrigues, and indeed it had become such a menace to the lives of the Abbasid Caliphs that only fifty-six years after it was founded (i.e., in 892), it was decided to shift the capital back to Baghdad, and Samarra lost the last vestige of its importance within the next sixty years.

At Baghdad there was now a renewed spate of building activity. Al-Mutadid (892–902) who had enlarged the Hassani Palace in 893, and had enclosed it with a defensive wall and had added a race course to it, did not rest content, for Masudi says he had no other interest but in women and in building. Masudi adds that he erected the Palace of the Pleiades occupying a space of three farsangs and at a cost of 400,000 dinars. The two palaces were connected by an underground passage. Annexed to the palace were rooms for students of science who got grants for their studies (Maqrizi iv, 192). The next Caliph Mutakfi (902–7), presumably as a lingering nostalgia for the Malwiya in Samarra, built for himself in the grounds of the Taj Palace a high semi-circular dome with external ramp which, according to al-Khatib enabled him to ascend to the summit on the back of a donkey. Al-Khatib also refers to the New Palace of al-Muqtadir (908–32) with its pool (30 cubits long) flanked by the representation of a file of fifteen equestrian statues with levelled lances, and within it a silver tree with gilt birds that sang. He further mentions a zoological garden, an armoury, and gilt boats floating on a pond of mercury. Miskawaih says that the palace had so many courts and corridors that the Byzantine ambassadors were weary with tramping and bewildered. All these palaces have long since vanished in the trials and tribulations which beset the city, while in Samarra some trace of the Abbasid glory remains precisely because the buildings were relatively unmolested.

But even in Samarra we must imagine that the buildings served as a quarry for materials, and did not decay simply through natural processes. Ibn Miskawaih does tell us in fact the Buyid ruler...
Muizzaldaulah demolished and re-used materials from the palaces in Samarra for building his own palace in the highest part of Eastern Baghdad in 961–2. The kiln-burnt bricks were manufactured specially for the purpose, and the total cost was 13 million dirhems. Masons were brought from Ahwaz, Mosul, Isfahan, etc., and with a view to durability the earth was excavated for foundations up to a depth of 36 cubits (or about 65 feet), and then filled with lime and clay up to a cubit above the surface. 217

It is not an easy matter to analyse why the Arabian Empire declined. Internal insurrections, fruitless foreign campaigns, rivalries, assassinations, the weakening of the moral fibre of the rulers through soft living, all contributed to the downfall of the Abbassids, and to these nature added her ravages by floods, famines, earthquakes, and epidemics. The result was that in the 10th century the Abbassid Caliphate approached its lowest ebb as one region after another seceded and set up its own independent kingship. To the South lay the Saffarids (867–903), to the East the Buyids (832–1055), and Ghaznavids (962–1186), to the North the Samanids (874–999), and to the West the Tulunids (868–904), Aghlabids (800–909), and the Omayyads of Spain (756–1031). But before we pursue the thread in these adjacent and distant lands let the Arab Abul Ala (973–1057) have his parting shot:

‘No realm is founded that escapes decay.
‘The firmest structure soon dissolves away.’

NOTES


2. Ibn Haukal’s (978) explanation that ‘excessive heat hinders the building of houses’ partly helps explain the lack of ambition in this direction since the phenomenon persists both before and after the coming of Islam (The Oriental Geography of Ibn Haukal, tr. Ouseley, p. 8).

3. Ibn Sa’d, Tabakat, iii, 2, p. 136, who avers that the perfect man had to cultivate writing as well as swimming and shooting.


6. L. Woolley, Alalakh, 1955, pp. 123, 126, fig. 71. Here the beams laid flush with the inner and outer faces of the wall and with short transverse timbers were originally plastered over.


11. A. Evans, Palace of Minos, i, pp. 333, 445. In one case the timbering was covered over by a coating of painted stucco (pp. 325), but in another form the representation of a house on a faience tablet the ends of the round beams do show externally (pp. 342).


14. A. Jamme, in Ancient Near Eastern Texts ... ed. J. B. Pritchard, 1955, p. 510, No. 12(2). Note that the specifically Abyssinian type of construction consisted of short beams let into the masonry perpendicularly to the wall and projecting as ‘monkey faces’ (in addition to the alternating use of wood and stone courses), and while Azraki records the use of this system in a church built by the Abyssinian Abraha (c. 550) at Sanaa, there is no reference to it in his description of the reconstructed Kaaba. (H. F. Wustenfeld, Die Chroniken der Stadt Mecka, i 1858, p. 104f.) See further A. Grohmann, Kulturgeschichte des Alten Orients. Arabien, 1963, p. 191f.

15. Cited by D. Matthews in Archaeologia xcvi, 1959, p. 2, n. 3, where it is further stated that in the 6th century Procopius discovered cross-beams in Persian military buildings.


17. Cf. also Psalm cxviii. 22, ‘The stone which the builders refused is become the headstone of the corner’ (cited in Matt. xx. 42, Acts iv. 11).

18. The first Kiswah or cloth covering put on the Kaaba, according to Azraki (d. 856), by Asad Tubba, a pre-Islamic Himyarite king of Yemen.
Muhammad (pbuh) continued this ceremonial practice of the pagan Arabs and once again ordered the sacred edifice to be covered with fine cloth from the Yemen. (Hughes, *Dictionary of Islam*, pp. 280 and 338.) M. Gaudefroy-Demombynes claims that the Qureishites were in the habit of supplying a covering for the Temple every other year, and adds that Muhammad neither changed the site of the Holy Place, nor the idea of processions and sacrifices. (‘Le voile de la ka’ba’ in *Studia Islamica*, II, 1954, pp. 5–21 and esp. p. 8) The kiswah was not always black but had different colours in previous times (Ibn Hisham, p. 126).

24. As early as the 6th century bc the Jewish Temple at Elephantine was orientated toward Jerusalem. (B. Porters, in *Journal of the American Oriental Society*, 81, No. 1, 1961, p. 38f.)
25. The English word ‘mosque’ derives from the French ‘mosquée’, which in turn derives from the Spanish ‘mezquita’. The extraction of the latter from the Arabic ‘masjid’ is readily apparent. According to Noldeke the Arabic ‘masjid’ in turn derives from the Aramaic ‘masgedha’ or ‘place of adoration’ which is encountered in Nabatean inscriptions (*Encyclopaedia of Religion and Ethics*, t, pp. 666–7).
28. L. A. Sédillot, *Prologemenes des Tables astronomiques d’Oloug Beg*, 1853, p. 120f.
29. It is notable that Kadmos, son of Agenor, went from Phoenicia to Delphi, and built the city of Thebes on the spot a cow he had been following sat down to rest (Herodotus 2. 49; 5. 58).
32. Thus continuing the practice of Babylonian kings. Nabopolassar (625–40 bc) for example says he carried bricks and mud on his head and made his son work with basket and wagon while restoring the Etemenanki Temple in Babylon. (S. Langdon, *Building inscriptions of the neo-Babylonian Empire*, 1905, p. 53).
34. Bukhari, *Sahih*, bab. 65; Maqrizi, LV, 36.
40. K. A. Fariq, in *Islamic Culture*, XXVI, no. 4, 1952, pp. 255. The use of the public bath may have been taken by Ziyyad from the Sassanids, since the pre-Islamic Arabs did not seem to have had them. The Sassanids had in turn adopted them through the Byzantines: Qubad had found them in Amid, and in emulation he then ordered them to be built in all the towns of his empire. (Joshua Stylites, cited by U. Monneret de Villard, *Introduzione allo studio dell’ archeologia Islamica*, 1966, p. 101).
44. C. Rathjens and von Wissman, *Vorislamische Altterumer*, Sudarabien Reise, Bd. 2, 1932, p. 30. fig. 5; cf. figs. 29, 31. This temple is assigned to the 11–12 century bc, and was dedicated to the sun goddess Dhat Badan.
46. A. fulfilment of one of the Prophet’s private predictions (*Hadith*): ‘A time will come over my people when they will vie with one another in the beauty of their mosques; and then they will visit them but little.’ It may be that a conscious interest in art is subversive to a spiritual way of life, for as Ruskin says: ‘The religious passion is nearly always vividest when the art is weakest, and the technical skill only reaches its deliberate splendour when the ecstasy which gave it birth has passed away for ever’.
48. The Quran describes (LXXV, 9) the Angel Gabriel as being ‘two bowlengths’ away from Muhammad while the Message of God was revealed.
50. Citing Yahya ibn Yahya (H. Sauvare, Description de Damas, 1895, p. 375).
53. Kulb-us-Surur, i, fol. 105; Von Kremer, loc. cit.
54. Ibn Khaldun, Muqaddima, ii, 47.
58. The profiles of domes and barrel-vaults at Qusayr Amra has been shown to have had a wide currency in the later Roman Empire, especially in North Africa and in Syria. (J. B. W. Perkins and J. C. M. Toynbee, in Archaeologia, xcii, 1949, p. 193).
59. Cf. also the Chinese Buddhist tradition of the Kingdoms of the "four sons of heaven." (P. Pelliot, in T'oung Pao, 1923, p. 79f).
60. E. Herzfeld, in Der Islam, xx, 1933, pp. 233f.
63. E. Renaudot, Ancient Account of India and China by Two Mohammedan Travellers, 1733, p. 15. Cf. Abu Zeid's version on p. 53 where their titles are given.
64. Jaussen and Savignac, Mission Archéologique en Arabie, iii, 1922, p. 89.
65. Philostratus, The Life of Apollonius of Tyana, tr. F. C. Conybeare, 1912, Bk. 1, ch. xxv. Note the expression used by Nebuchadnezzar (604–561 BC) in restoring two temples near Babylon: 'I built their structure like the midst of heaven.' (S. Langdon, Neubabylonischen Königinschriften . . . p. 182f, col. iii, 38).
67. A. A. Boethius, in Eratos, xlv, 1946, p. 422f.; Suetonius (Nero. 31) says that the rotunda revolved about its own axis night and day 'just like the world' (H. P. L'Orange, in La Regalita Sacra, iv, 1959).
71. The Mosque of Sanaa in Southern Arabia is exceptional in that it has pairs of confronted wood pigeons in carved relief (possibly of the First Century AD) embedded on its wall (C. Rathjens, Sabaecia, i, 1953, figs. 33, 34, pls. 134–5).
74. The Stabian Baths at Pompeii were likewise painted with zig-zag dadoes.
75. Dadoes painted so as to imitate marble and porphyry are known from Hellenistic times, for example, in a house of the 1st century AD from Hermopolis in Egypt (Illustrated London News, 4 March 1933, p. 311).
76. E. G., Antonine sarcophagi (D. E. Strong, Roman Imperial Sculpture, 1961, pls. 100, 118).
77. Cf. female deities holding cornucopiae at Hatra (Illustrated London News, 18 Dec 1954, p. 117, fig. 8), and nude women holding pomegranates in Sasanian vase of silver with niello inlay (Ars Islamica, 1937, iv, fig. 32).
78. Maqrizi, Khitat, i, 316.
79. Arabic juss, Persian gatch, Assyrian gassu, Greek gupsos, and Latin gypsum.
80. Qasr Kharana is an exception, and though it has a graffito inscription of 710, it has few affinities with other Omayyad palaces and may just be pre-Islamic. See Jaussen and Savignac, Les Chateaux arabes, ii, pls xxx–xxxv. The pairing of vaulted rooms on either side of an oblong court, however, relates it to the boyts of Mshatta and Tuba.
suggests a conscious symbolism of the Caliph triumphant over the elements. (Cf. R. Ettinghausen, *Arab Painting*, 1962, p. 36.) This was expressed physically each time the ruler mounted up the stairs.


84. Le Strange, *Palestine under the Moslems*, p. 346 (citing Yakubi).


85a. For the ancient origin of the game preserve, the *Paradise*, see R. A. Jairazbhoy, *Oriental Influences in Western Art*, 1965, pp. 321–2, 45. 102–3.

86. A. Gabriel in *Syria*, viii, 1927; also 1931, pp. 316–18; and 1934, pp. 24–32.

87. *Prairies d'or*, de Meynard, v, p. 466.


89. Note that the Golden Gate of the Palace of Dicoleitian at Spalato (303–5) in Dalmatia has a relieving arch over a joggled doorhead, arrowslits, and flanking decorative niches. (Heard and Zeiler, *Spalato*, 1912, pp. 34–5.) A gate at Antioch also had a joggled doorhead with semicircular arch over it (see G. Downey, *A History of Antioch in Syria*, 1961, pls. 20–21).


91. Ibn Khalikan says Hisham died in 743 at ar-Rusafa in the district of Kinnisrin (tr. de Slane, iv, p. 444).


93. Already at the Nabatean Temple of Allat at Jebel Ramm (first half of 2nd century AD) the round columns of masonry were revetted with stucco carved with flutes (R. Savignac and G. Horsfield, 'Le Temple de Ramm', in *Revue Biblique*, XLIV, 1935, p. 251, fig. 3).


96. A close prototype are the bearded portrait busts in a 4th–6th Century wall painting in South Uzbekistan. (L. I. Al’baum, *Balalyk Tepe*, 1960, fig. 148.) The idea survived in Islam for we know that the Fatimid Caliph al-Amir bin Abham Allah (d. 1130) built at Birkat al-Habash near Cairo a belvedere of lacquered wood decorated with portraits of his favourite poets (F. R. Martin, *The miniature painting and painters of Persia...*, p. 5).

97. I offer further evidence for this interpretation in the *Journal of the Royal Asiatic Society*, pts. 1–2, 1960, p. 73.

98. E. g., at Ostia in a public latrine probably of the 4th century AD (R. Meiggs, *Romam Ostia*, 1960, pl. xxb).


104. This was Firoz Shah Bahmani (1397–1422) in the city that he founded south of Gulkarga (Ferishtha, tr. J. Briggs, 1829, ii, p. 369).

105. H. C. Butler, *Princeton Expedition, Southern Syria*, 1919, pp. 31f., 50–51. III. 32. These in turn may be successors of Roman arches set over architraves of which we have examples at Miletus (late Roman gate), Baalbek (north city gate), Petra (tomb of Sextus Florentinius), and other (D. F. Brown, in *American Journal of Archaeology*, 46, 1942, p. 394).

106. J. Sauvaget maintained that a number of structures hitherto attributed to pre-Islamic times may well be Omayyad. Few are datable, e.g. Hauravin (680–4) and Qasr Burki (700), but many are characteristically contained within square enclosure walls engaged with half round buttress towers. (‘Remarques sur les monuments Omayyades’ in *Journal Asiaticque*, Jan–Mar. 1939, pp. 1–59). Kastal is also regarded by H. Stern as being Muslim since its dimensions are like others based on units of 100 Roman feet or 35 metres. (‘Architecture des chateaux Omayyades’ in *Ars Islamica*, 1946, pp. 72–97). Palaces at Jebel Seis and Minya at any rate date from al-Walid (705–15). Creswell’s view is that the dating inscription
on Qasr Burku does not belong to the monument, and that Qastal was indeed built by a Ghassanid ruler as Hamza al-Ishafani claims (op. cit., new ed., pp. 517, 654). Whether or not Anjar is Islamic, the plan of the city with 4 roads each starting from a gate and intersecting at the centre, goes back to a Roman camp described in the 2nd century BC (See R.A. Jairazbhoy, Foreign Influence in Ancient Indo-Pakistan, Karachi, 1995, p. 54). Creswell contends that the use of fortified enclosures in completely safe territory was simply in emulation of the Roman *limes* or frontier forts which the Omayyads had occasionally occupied since they lay on the army route (in Encyclopaedia of Islam, new ed. 1957, 1, fasc. 10, pp. 612–13). More specifically, Mshatta is claimed to reflect the characteristic form of a late Roman castrum. (S. Betini, ‘Il Castello di Mshatta,’ in Anthemion..., in onore Carlo Anti, 1955, pp. 321–66).

107. Abdal-Malik could not have intended to replace Mecca by Jerusalem permanently for that would have been perpetrating a pious fraud such as an orthodox believer would have been quite incapable (cf. S. D. Goitein, in Journal of the American Oriental Society, 1950, pp. 104–8).

108. Le Strange, op. cit., p. 46.

109. See H. Schmidt, Der Heilige Fels in Jerusalem, 1933.


111. The ritual entrance to the underworld among the Babylonians was the *nérab ersiti* (W. F. Albright, in Bulletin of the American Schools of Oriental Research, 57, 1935, p. 23). Deep drains in Mesopotamian temples had a ritual significance and libations were poured into them to the *apsu*, or the waters of the underworld (S. Smith in Journal of the Royal Asiatic Society, 1925, p. 60, and L. Woolley in Antiquaries Journal, 1926, p. 400).

112. Ibn Isqah (d. 768) was the first to connect Muhammad's Night Journey (*isra*) with his Ascension (*miraj*), and to claim that the latter took place at the Masjid al-Aqsa at Jerusalem. Prior to this it is argued that the Quranic reference (XVII: 1) to the *masjid al-aqsa*, 'the furthest place of worship', applied only to a sanctuary near Mecca called al-Jiranah which the Prophet had visited in 629 (A. Guillaume, in Al-Andalus, viii, 1953).


114. Referred to in inscriptions as 'masters'—*Mu'allim* in the West and *Ustadh* in the East, or 'builders'—*banna*, or 'architects'—*Mimar*, or finally as 'engineers'—*muhandis* (L. A. Mayer Islamic Architects and their Works, 1956, p. 251).


116. Ibn al-Kifti claims that Euclid was a carpenter by vocation (M. Plessner, in Encyclopaedia of Islam, new ed., fac. 16, p. 994).


119. For the mathematical background of Sta. Sophia's architects, see G. Downes, 'Byzantine Architects, their training and methods', in Byzantion, XVIII, 1948, pp. 99–118, esp. 112f.

120. Contemporary acanthus rinceaux of precisely this type in mosaic uncovered recently from a room over the S. W. ramp of Sta. Sophia enable us to attribute some of these mosaics directly to Byzantium (E. Kitzinger, in Berichte zum XI. Internationalen Byzantinisten-Kongress, Munchen, 1958, p. 10, n. 30).

121. H. A. R. Gibb, in Dumbarton Oaks Papers, xii, 1958, p. 225–9. Tabari's account of Byzantine workmen and mosaic being sent for the reconstruction of the Prophet's Mosque in Medina in 707 goes back through Waqidi, d. 823, to the very officer in charge of the reconstruction. For Byzantine mosaics and implements at the Mosque of Damascus we are dependant on Muqaddasi.


123. Le Strange, Palestine under the Moslems, pp. 92–3. H. Stern argues that the Mosque was founded by Abdal Malik, and modified by al-Walid (Ars Orientalis, v, 1963, pp. 27–47).

124. H. I. Bell, 'The Aphroditus Papyri', in Der Islam, 1911, Bd., ii, Hft. 4, p. 383, and 1913, Bd. iv, Hft. 1/2, p. 95. Note also that a sawyer is demanded for work at the Mosque of Damascus (no. 1341), and workmen and cleft palm trunks for roofing the Palace of the Commander of the Faithful at Fustat (nos. 1342, 1403).

126. So also the fine mihrab which dates from Saladin (1187), and present porch from its occupation by the Templars (1099–1187) with some Muslim restoration in 1217. R. W. Hamilton holds that the stilled slightly pointed arcade to the east of the dome dates the old Omayyad Mosque (Structural History of the Aqsa Mosque, 1949, p. 10ff., fig. 7, pl. vii).

127. Palace and Mosque at Ukhaidir, 1914, p. 165.


129. A high nave flanked by lower aisles contained with a rectangular plan with the entrance on one end of the main axis and the tribune on the other often backed by an apse, is found among such Roman basilicas used for civil purposes as At Pompeii, on the Palatine at Rome, at Tivoli and at Porto, to mention only a few (Leroux, Les origines de l'édifice hypostyle, 1913).

130. Sauvaget maintained the transept was suggested by the throne hall of palaces with the throne niche at the end of it (La mosquée omeyyade de Medine, 1947), and that it had a purely aesthetic function.

131. Mussaud (in Syria, iii, 1922, p. 236) has suggested that the original term may have been ‘dome of the gable’, the word for gable being aetos in Greek, but that the Arabs translated it by its alternative meaning which is ‘eagle’.

132. M. van Berchem has pointed out that the six great arches of the transept are slightly horseshoe and very slightly pointed (Bulletin d'Etudes Orientales, 1937–38, viii–xviii, p. 39f).

133. Where such columns were impossible to obtain as in the Medina Mosque, the Arabs resorted to using stone drums which, Ibn Jubayr says, had their cores bored and on being fitted together were filled with molten lead; the exterior was then coated with gypsum polished until the columns resembled white marble.

134. A. K. Porter, Medieval Architecture, its origins and development, 1909, pp. 50–51. Thus the Temple of Jupiter employed materials from the Temple of Haddad (9th century BC or earlier) as may be seen from the sphinx with double crown on a carved basalt orthostat which came to light on the exterior of the N.E. corner of the North wall of the Mosque of Damascus during the course of recent restoration (Djafar Abd el-Kader, in Syria, xxvi, 1949, pp. 191f.). Two thousand years later it was still remembered as originally being ‘the palace of Ben-Hadad’, by Benjamin of Tudela (1160–73).


136. Tabari, Annals, i, 2405.


138. The Prophet had originated the practice of thrusting a lance in the ground between himself and the congregation so as to leave sufficient space for circulation (Ibn Sad ii p. 8). A rare coin dating from Abdal Malik’s reformation of the coinage in 692 (prior to this Muslim coins invoking Allah’s name had the Zoroastrian fire temple on one side and the head of the Sassanian monarch on the other) represents the ana or lance which is supported on a tripod and is contained within a round arch having engaged flanking columns (G. Miles: ‘Mihrab and Anazah….’ in Archaeologia Orientalia in Memoriem Ernst Herzfeld, 1952, pp. 156–172). It should be recalled that the lance was the insignia of the khathib, the spokesman of the tribe in pre-Islamic Southern Arabia, and that he often struck the earth with it (references in Encyclopaedia of Islam, ii, 1927, p. 928). The Muslim khathib or preacher inherited the feature of the lance emblem (Jahiz, iii, 135).

139. According to the Traditions gathered by Bukhari, the Prophet prayed in front of a number of different objects (sutra) including baggage-camels, horses, trees, saddles, a couch, a lance, a stick, and the pillars of the mosque (see A. W. Wensinck, ‘Sutra’, ‘Harba’, ‘Anaza,’ in Encyclopaedia of Islam).


141. H. T. Bossert, Alt Syrien, 1950, fig. 408. Also F. S. Sukkink, The Synagogue of Dura-Europos and its frescoes, 1947. But compare this with the shell niche apse of the Praetorium at Masmia (160–9) in the Hauran (de Vogue, Syrie Centrale, p. 46, fig. 11).

142. C. H. Kraelling, The Excavations at Dura Europos. Final Report. ‘The Synagogue,’ 1956, pp. 54, 61. Two other features here anticipate the mosque: one is the preacher’s chair next to the niche, the other a portico round the court.


145. The actual representation of the lamp in the mihrab niche did not take place until later, perhaps as a result of al-Ghazali’s commentary Mishkat al-Anwar on the Light Verse, in c. 1106 in which
he interprets the symbolism of Niche, Glass, Lamp, Tree, and Oil, (Al-Ghazalâs Mishkat al-Anwar, tr. W. H. T. Gairdner, 1924, pp. 84–6).

146. The word mihrab does occur in the Quran but in one instance it refers to the King’s place in a palace (xxxviii. 20), and in another to the place where prayers are said in a temple (xix. 12, see also xxxiv. 12, and Ibn Qutaiba, Uyun al-akbar, p. 356). The original pre-Islamic sense of the word mihrab, it is argued, was ‘a row of columns’ (R. B. Serjeant, ‘Mihrab’, in Bulletin of the School Oriental and African Studies, xxii, Pt. 3, 1959, pp. 439–53).


148. Palestine Pilgrims Text Society, Vol. III, p. 18. Muqaddasi complained to his Uncle about this prodigality, but was reprimed for his puritanism, and informed about the true psychological need for such a lavish display: that is to build a unique mosque, ‘a wonder of the world’, to prevent the Muslims looking at the Christian churches which were so ‘enchanting fair’.

149. South Arabian inscriptions of 450 and 543 AD relating to the construction of the dam at Marib similarly mention huge figures as food supplies for labourers. (Corpus Inscriptionum Semiticarum, IV, nos. 540, 541). Herodotus (II, 125) purports to give an account of the provisions consumed by the builders of the Pyramid.


151. E. de Lorey, in Syria, xii, 1931, pp. 326–49.

151a. Compare F. Rakob, in Archäologischer Anzeiger, 1969, hft. 3, Abb. 28, p. 299. This comparison with Roman landscape painting suggests that it is not a ‘cloistered curvilinear bridge,’ as I once thought.

152. The apadana at Persepolis has four square corner towers, one at each corner of the structure. (Schmidt, Persepolis, I, p. 73. fig. 30). The earliest freestanding square towers are in the 6th century bc also in Achaemenid Persia. Then in 351 bc the wife of Mausollos (who was nominally governor of Caria in Western Asia Minor under the Persian kings) built a great memorial for her husband at Halicarnassus employing the (Persian) square tower base, a median structure of (Greek) temple columns, with a stepped pyramidal roof (like a Mesopotamian zigurrat) raised above it. (Renaissance architects such as Filarete and Bramante conceived just such an idea of piling up famous ancient monuments on top of one another, of Journal of the Society of Architectural Historians, 1958, xvii, no. 3, p. 16). The fame and influence of this edifice was such that the word ‘mausoleum’ became a permanent designation for such structures, and moreover the funerary towers of the 1st century bc in Syria continued to retain the square substructure with pyramidal roof (cf. E. Will, ‘La tour funéraire de la Syrie et les monument apparent,’ in Syria, 1949, pp. 258–312).

153. The Jews had used a clapper (naqus) for making the call to prayer, and the Christians a trumpet (bugu).


154a. The resemblance of the Kairouan minaret with a lighthouse which I have suggested is evidently not fortuitous. A mosaic shows that the Roman lighthouse in the harbour at Salakta had a tower with stepped stories, and also the lower shaft was slightly tapered. Lézine claims that the Kairouan minaret dates from 836 (Architecture de l’Ifriqiya, Paris, 1966, p. 162).

155. Ibn Shakir says that when Walid mounted up to the southern tower of the Church of Damascus before its demolition he found a monk living there in a sort of hermitage (saumaa), (Uyun al-Tawarikh, in Quatremere, Histoire des Mamlouks, ii, p. 264). Since these Damascus minarets were used as sanctuaries for Muslim anchorites as late as the 12th century (as we know from Ibn Jubayr) it is difficult not to believe that this was a continuation of an old practice, and it is also difficult to reconcile Yaqut’s contention (ii, 596) that in pre-Islamic times the towers served as fire temples where fires burned.

156. A. Lézine, Le Ribat de Sousse..., Tunis, 1956.


158 Al-Bakri, Description de l’Afrique Septentrionale, tr. de Slane, 1913, p. 59f.

159. Al-Muqaddasi, tr. Ranking and Azoo, pp. 192–3. As against this there was the advice attributed to the Prophet that high mosques were not to be commended (Mishkat al-Masabih, tr. J. Robson, 1963, i, p. 145).

160. E. T. Dewald, ‘The Appearance of the Horseshoe Arch in Western Europe’, in American Journal of Archaeology, 1922, pp. 316–337. See also L. B. Holland (in A. J. A. 22. 19. 1918, pp. 378–98) for evidence negating the structural use of the horseshoe arch in northern Spain before the end of the 9th century, which suggests the feature was not autochthonous but was brought by the Moors (also G. T. Rivoira, Moslem Architecture, 1918, p. 240f.). There is no direct proof that the horseshoe arches of Syrian churches were influenced by the
shape of the entrances of the lithic Cave Temples of Buddhist India, but this possibility must nevertheless be entertained in view of our knowledge of the close contacts at this time (see R. A. Jairazbhoy, *Foreign Influence in Ancient India*, 1963, p. 118f.).


162. L. Torres Balbas ‘Nichos y arcos lobulados,’ in *Al-Andalus*, xxii, 9156, pp. 147–172) has arrived independently at the same conclusion. The lobed arch became possible when the shell was turned so that its node was at the base and not at the apex of the niche.

163. The round window filled with simple pierced designs originated in Syria c. 5th–6th century AD, was given monumental expression by the Muslims at Khirbat al Mafjar (c. 740), came to Kairouan and to Spanish Asturian churches in the 9th century, and to Romanesque Italy over two centuries later. (Cf. H. G. Franz, ‘Die Fensterrose und ihre vorgeschichte in der Islamischen Baukunst’, in *Zeitschrift für Kunstwissenschaft*, x, 1956, pp. 1–22).

164. The melon dome is known in early Christian art through representations (see E. B. Smith, *The Dome*, 1950, p. 122, and figs. 16, 152, 153). It may also be seen in the mosaics of the Damascus Mosque (Ibid., fig. 41).

165. J. Schacht (‘An unknown type of Minbar and its historical significances’, in *Ars Orientalis*, ii, 1957, pp. 149–75) contends that there must have been wheeled minbars wherever there are recesses in the qibla wall to the right of the mihrab, a type abounding in North Africa, e.g. at the Great Mosques of Sfax (849 and 988), Tunis (864), Susa (end of 11th century), Algiers (1096), Tlemcen (1136), Qarawiin at Fez (c. 1136), Tozeur (1194), Kutubia in Marrakesh (1146–62), Tinnal (1153–4), the mosque of Hassan in Rabat (1196–7), etc.

166. Tabari, i, p. 1591.

167. Maqrizi, iv, 8. An obvious doubt about this tradition arises since Ibn Duqmāq (iv, 63) and Maqrizi cite two additional and quite different traditions about the origin of this same minbar. On the other hand there is a strong likelihood that the word minbar itself is an Ethiopian loan word. Some ancient Ethiopian minbars in stone survive at Aksum (*Sauvaget, La Mosquee Omeyyade de Medina*, 1947, pp. 140–2). The Ethiopic word is *manbar* ‘seat’, from *nabar* ‘to sit’. An early 6th century Byzantine church excavated at Eboda in the Negeb in Israel also had pulpits at the head of the nave but to one side (*Illustrated London News*, Nov. 26, 1960, p. 946, figs. 10, 14).

168. al-Fakhrī remarks that if any ruler were to boast in his time (1301) in this manner he would be regarded as a fool (*al-Fakhrī*, ed. H. Derenbourg, 1895, pp. 183–4; and tr. C. E. J. Whitting, 1947, p. 130).


170. G. Le Strange, *Baghdad under the Abbassid Caliphate*, p. 16.


173. Muawiyah’s mansion at Damascus (644–56), Hisham’s Palace at Rusafa, and Hajjaj’s Palace at Wasit (703–5) all had green domes, and this leads us to ask if the colour could have been symbolic. Already Hammurabi (1792–50 BC) decked with green the Chapel of Aya at Sippur (*Hammurabi Code II*, 26), but what sort of structure the *gigunu* was is as yet uncertain. It would appear from the *Musnad* of the orthodox traditionist Ahmad Ibn Hanbal that the martyrs dwell across a river (Barik) at the gate of Paradise in a green *Kubba* (R. Eklund, *Life between death and resurrection according to Islam*, 1941, p. 104). Moreover, the word *al Khadra*, ‘the green’ is stated to be one of the synonyms for heaven in Arabic (M. Aga-Oglu in *Journal of Near Eastern Studies*, v. 1946, no. 4, p. 46). It is notable that when Mansur left his Green Domed Palace in 775 and built another palace outside Baghdad (which was becoming over-crowded) he gave it the name of Qasr al Khuld or ‘Palace of Eternity,’ named after the palace which is mentioned as the reward for the Godfearing in the *Quran* (xxv. 16). With the Arabs green was the colour of paradise, no doubt because that colour recalled the aim and destination of all wayfarers—the Oasis. Later with the Persians, blue became the ascendant colour, partly because the dome had become identified as the microcosm of the sky, and also because of the talismanic effect of the colour. Thus the 11th century Persian Shamseddin states that turquoise (*piruzeh*) was a stone of good omen as its name implied ‘victorious’ (*Ouseley, Travels in various countries of the East* 1819, i, pp. 210–12).

174. Caliph Mansur even went to the extent of transferring the markets outside the Round City at the advice of the Byzantine ambassador who had warned him that it was likely to be infested with
spies and rioters (S. Runciman, in *Sumur* XII, nos. 1, 2, 1956, p. 46).


179. A man by the name of Ukmaidir who had accepted Islam through the Prophet himself did exactly this thing, i.e. he saw a city of stone (Dumat al-Jandal) in ruins with only a few walls standing and rebuilt it. Khalid ibn al-Walid passed through this place on his way from Iraq to Syria (Baladhuri, *Origins of the Islamic State*, 1916, p. 97).

180. Facing Anbar and not Kufa be it noted.


183. Loopholes in ancient Khwarizmia e.g., at the Koi Krylgan-Kala are arrow shaped, but the treatment of the head of the arrow is not of this type; (See S. P. Tolstov, *Auf den Spuren der Althoresischen Kultur*, 1953, Abb. 21. 3), nor those excavated in the city wall at Istakhkr (E. Herzfeld, *Iran in the Ancient East* 1941, pls. xcii, xciii).

184. The leaning barrel vault goes back in Egypt to the end of the First Dynasty (W. B. Emery, op. cit., p. 102, pl. 116).


188. This is known from an inscription within it. We learn from Baladhuri (869) that al-Walid had built a house at Ramla called Dwelling of the Dyers with a cistern in the middle of it (Le R. P. Marmardji, *Textes Geographiques Arabes sur la Palestine*, 1931, p. 81).

189. The extent of the ruins of Raqqa is wonderfully revealed by an aerial photograph (M. Dunand, *De l’ Amanus Au Sinai*, 1953, pp. 94–8). Abbasid palaces have been excavated; see *les Annales Archeologiques de Syrie*, 1, 1951, pp. 111–21; iv–v, 1954–5, pp. 205–12; vi, 1956, p. 25f.

190. There is however Assyrian evidence for a town named Surnarrati, which could have been the old name of Samaara (J. Lewy, in *Melanges Isidore Levy*, 1955, p. 317).


194. Mustawfi says this stone ablation basin made by Mutasim was 23 paces in circumference and stood 7 ells high (Le Strange, *Lands of the Eastern Caliphate*, p. 56).

195. Beckford suggests in his ‘Vathek’ that this corkscrew tower was the symbol of a wish, ‘an insolent desire to pry into the secrets of heaven.’ But if there is any symbolism implied it is in the belief of the ancient East that there are seven concentric zones of heaven. That is why they placed the temple of the god as the seventh stage of their ziggurat; Gudea of Lagash had, for example, the e-Pa ‘temple of the seven zones’ to his god Ningirsu. (Parrot, *Ziggurats et tour de Babel*, 1949, p. 17).


197. For an event in 1073 ibn al-Banna refers to trapdoors leading to subterranean vaults below dwellings in Baghdad (see *Arabica*, vi fase, 3, 1959 p. 287). The houses of Qumm had serdabs c. 950 according to Abu Dulaf (Minorsky’s transl. p. 50).

198. J. Marshall, Taxila, 1951, i, pp. 63–4. There were *cryptas* for the enjoyment of Roman soldiers which Hadrian abdolished (*Scriptores Historiae Augustae, Hadrian*, x, 4). There is a reference to watercooled subterranean chambers in Kalidasa (*Raghuvamsa*, xix, 9).


202. Yaqut, *Mu'jam al-buldan*, iv, p. 44. The site of Samarra had incidentally been bought from Christians who had a monastery on the site. (Tabari, 1180).

202a. There were also found square glazed tiles painted with cocks in garlands (F. Sarre, *Die Keramik von Samarra*, 1925, p. 50f., taf. xxii).

203. The Theatre of Athens was made watertight at the end of the 3rd century AD, for the purpose of holding mimic sea fights (A. E. Haigh, *The Attic Theatre*, 3rd edn. 1907, p. 103). The Byzantines had staged a *naumachy* in their flooded arena for the benefit of the ambassadors of the Abbasid Caliphs (S. Runciman, in *Sumer*, xii, nos. 1, 2, 1956, p. 48). That the Muslims had adopted the practice we know from the author of the *Istitbar* who describes the Dar al-Bahr at the Qala of the Banu Hammad as having a vast basin in its centre fed by water brought from a great distance, and where nautical jousts took place (Fagnan *L’Afrique Septentrionale au xve siecle*, p. 101; L. Golvin, *Le Maghreb Central*... 1957, p. 188).


207. B. N. Zasypkin, *Architecture of Central Asia* (in Russian), 1948, p. 31f. The Merv dome is stated to have had a diameter of 55 cubits or about 100 feet, whereas the Termez dome had a diameter of 11½ metres or about 36 feet.

207a. The poet al-Buhturi had to pass through 300 apartments and vestibules before he came to where al-Mutawakkil sat on a golden throne. (Al-Asmai, cited by Isfandiyar c. 1216; *History of Tabaristan*, tr. E. G. Browne, 1905, p. 159).


211. V. Minorsky, in *Bulletin of the School of Oriental and African Studies*, ix, pt. 3, p. 65. The blind multifoil arch in a frame was disseminated to China (evidently from Samarra) where it appears in the pagodas of the late 10th century at Chekiang and later at Jehol (see L. Sickman and A. Soper, *Art and Architecture of China*, 1956, pls. 166B, 175).

212. Mutasim is claimed to have disliked the decoration on his buildings, 'his purpose being to make them more solid' (*The reign of al-Mu'tasim 833–842*, tr. E. Marin, 1951, p. 130).

213. At Huwaisilat for instance, only the public halls and their pavement were of baked brick. Elsewhere the walls were composed of a kind of concrete consisting of pebbles held by a matrix of gypsum.


215. al Khatib, tr. G. Salmon, 1904, p. 139.


217. Ibid., ii, 1921, pp. 198–9. Darius i claims that he excavated 40 cubits in the earth till he reached rock, packed it with rubble, and on this he constructed his palace at Susa. (R. G. Kent, *Old Persian*, 1950, p. 144). The cost of all the Samarra palaces was estimated by Yaqut at 204 million dirhems or over 8 million sterling (Le Strange, *Lands of the Eastern Caliphate*, p. 55).
Inspired by the religion of Islam the Arabs were ready to carry the Message of Allah to the ends of the Earth. When they came as far as the place where Atlas proverbially balanced the World on his back they were informed by their new confederates of North Africa that though they had literally reached the end of the Earth in a westerly direction, there lay across the straits to the North a land of green pastures and a temperate air. Already the Moors were so completely won over to Islam that it was a Berber who was allowed to lead the army into Spain. Under the ex-slave Tarik, a contingent was landed at Gibraltar in 711. The Visigothic army was soon overcome, and a spectacular drive northward was launched. Within twenty years the Moors had driven through the Pyrenean passes to within 150 miles of what is now Paris. Here fate tipped the scale. In 732 Charles the Hammer routed their much disordered army at Tours, and Europe breathed again. The invaders returned to colonize the Spanish Peninsula. Recently at Narbonne, which had been occupied from 719–760, there were excavated pottery, and a horseshoe arch in the court of La Madeleine, and Arab coins in the city and environs.¹

When the debacle of the Omayyads was enacted in Syria, the only heir of this dynasty who escaped the ruthless massacre was the hawk-faced Abdal Rahman. This intrepid youth outswam his pursuers, and loped on camel-back across hundreds of miles of desert gathering bands of followers wherever he went. Filled with the zeal not to let the rule of his fathers perish, he arrived at the other extremity of the Mediterranean. The Arab rule in Spain was in turmoil, and he had no great difficulty in bringing off a coup d'etat. He burst into Cordova, declared himself its Amir (756), and set about reconciling the dissident tribes. Thus did the Omayyad dynasty live on to inaugurate another brilliant age.

Toward the end of his reign Abdal Rahman I realized the incongruity of the Muslims offering their prayers in a low-ceiling improvised shelter, and began to negotiate with the Christians with a view to purchasing the site of the Church of St. Vincent which they had shared for over fifty years. Since he offered them suitable compensation the Christians consented without demur, and the Amir went about demolishing the church. In its place he built the Great Mosque of Cordova in 784–86.² In plan it consisted of a walled courtyard preceding a nine or eleven-aisled sanctuary.³ The aisles traversed toward the qibla as at Kairouan, instead of being parallel with it as at Damascus. The middle or sixth aisle was a yard broader than the rest; it led by an arcade of twelve arches directly to the mihrab. The parallel disposition of the aisles was expressed on the exterior by a series of triangular gable roofs exactly as at the Aqsa Mosque. All these features were not new, but the problem of raising the timber ceiling to a dignified height was met by a sensational expedient. Over each column, and between round horseshoe arches springing in opposite directions, was jammed an impost block, and from this sprang a second set of arches above the first⁴ (PLATE 20). By means of this device the ceiling was carried upward by at least the height of a man. The overhang of the imposts as they settled on the capitals was reduced by carving them to resemble Pan-pipes bound with a median spike. We shall have occasion later to point out the possible Indian origin of this form.⁵ This type became more and more popular for bracket support from this time on.

The other innovation was to build up the arch rings with voussoirs of alternating white stone and red bricks in blocks of four. Already in the Syrian Omayyad Mosque in Hama such an effect of polychromy had been achieved in the piers, voussoirs, and windows by the regular alternation of limestone and basalt.⁶ Alternate banding of materials in walls has an ancient ancestry.
According to Herodotus the walls of Babylon consisted of layers of burnt brick, each of thirty rows, alternating with layers of woven reed, and it was precisely this system with courses of brick bonded with bundles of reed which had been revived in the city walls of al-Mansur’s Baghdad. But the bitumen-bedded reeds were purely constructional, and could hardly have been visible. On the other hand at Tell Halaf in North Syria the intention was purely decorative, and black and red stones were used in alternation, while at Pasargadae and Nakshi Rustum in Achaemenid Persia the façades were lined with alternating white and black masonry. The use of alternating horizontal courses was early adapted in Roman architecture, for instance, in the Porta Ercolana at Pompeii (end of 2nd century BC) where brick bands are inserted in rubble, the intention obviously being to strengthen the fabric. The fortifications of Roman Gaul and Byzantine Asia Minor continue this use of opus mixtum, in the former case even in arches in some instances. A limited application of this form of construction to arches occurs in Christian architecture at the Baptistery of Frejus Cathedral (5th century AD), at the Baptistery of Nocera Superiore near Capua (6th century), and at the Church of San Demetrios in Salonica, either dated from the year 450 or from 650, when it was entirely restored, where, however, the voussoirs are alternately encrusted with coloured marble. It is at any rate an established fact that the veined and multi-coloured marble columns at Cordova were obtained ready-made from Roman ruins.

The founder of the Mosque had built no minaret. Five years later in 791, however, his son Hisham added a square tower on the side of the forecourt opposite the sanctuary just as at Kairouan. According to Maqqari this minaret was completely rebuilt in 951–2 in stone by Abdal Rahman III. Edrisi describes it as having two separate staircases, and the shaft of the tower was four-fifths of height of the whole, the remainder being taken up by the four-doored domed kiosk on the top with its finial consisting of three apples in gold and two in silver. Edrisi further says that all the four façades were treated with two ranges of incurving (horseshoe) arches rising from columns of which there was a great number employed. From base to summit there was epigraphic and polychromatic ornamentation, and revetment in carved tufa. Unfortunately, the façade was covered by thick Renaissance masonry behind which exists the old minaret with its double stairs to this day. Relying mainly on a bas-relief on the door of Sta. Catalina (1557–72) in the cathedral this minaret can be conjecturally restored.

In 833 Abdal Rahman II, being acutely aware that the population of the city had swollen beyond all expectation, started to amplify the Mosque by carrying the qibla wall another eight aisles southward. He had already built the Great Mosque of Seville in 829–30. This is known from a foundation inscription (the oldest in Arabic Spain) now in the local Museo Archaeologico. The minaret of this mosque with a quadrangular exterior and a circular staircase, is now the lower section of the tower of the Church of Salvador. In Merida, Abdal Rahman II built the Alcazaba in 835. It is a square enclosure buttressed with rectangular towers, and the approach is from a bridge across the Guadiana and through a barbican involving a turn. A cistern survives inside (Arabic aljibe) which has a covered gallery leading by steps from the river to the reservoir. This Amir’s son Muhammad rebuilt the door called San Esteban on the west side of the Mosque of Cordova. An inscription gives the date as 855, and the work conveys to us an idea of the architecture of this period. The doorhead is a flat arch, and above it is a round horseshoe relieving arch whose broad archivolt is composed of alternating packs of brick and stone voussoirs, the latter covered with intricate carved reliefs. A thin fillet with floral repeats inscribes a rectangle round the arch. Pierced marble grilles reduce the light entering through a pair of small windows. Though badly weathered, enough remains to show that the whole wall around the entrance was covered with a thick tangle of carved foliage. The doorway is further accented at the cornice by being corbelled on modillions with multiple lobes (Plate 21). Finally a stepped cresting gives the solid masonry wall something of a martial air.

It may be truly said that the growth and progress of the Mosque of Cordova reflected the state of refinement of the Moorish Empire itself. This
Empire had lately been fragmented by the formation of several independent provinces. It was left to the great Abdal Rahman III to weld them into a single powerful state that could hold its own against the Northern intruders. And to prove that a significant change had taken place Abdal Rahman cast off his title of Amir and pronounced himself Caliph of the West. During his reign (932–961) Andalusia came to maturity. He ordered an aqueduct to be built from the mountains of Cordova to the western part of the city. There the water was discharged through the mouth of a colossal lion into a vast reservoir. Maqqari, who tells us this, says that the Caliph ordered a statue of his mistress Zahra to be carved over the gate of his palace. This palace, the Madinat az-Zahra is situated a few miles north-west of the city. The chief architect and geometer was Maslama ibn Abdallah. He built a splendid hall whose description has been handed down by Arabic authors. An-Nuwayri describes a pavilion overlooking the garden which was supported by columns of streaked marble mounted in gold and inlaid with rubies and pearls. In front of this was a large tank filled with quicksilver, which was kept in perpetual motion and reflected the rays of the sun onto the pavilion. But according to Ibn Bashkuwal the basin was in the centre of the room, and it was surrounded by arches on streaked columns. There were eight doors of ivory and ebony ornamented with gold. Maqqari says: 'when the quicksilver was set in motion the whole room would in an instant look as if traversed with flashes of lightning. The company would begin to tremble thinking that the room was moving away or turning round or following the course of the sun.'

Work on the palace was begun in 963 but was not concluded until 989—that is, long after the founder's death. By then it was more like a royal city extending over an area one mile by a half on the slope of a hill. There were over 400 buildings for the lodging of the Caliph's family and Court, and 300 baths. According to Edrisi the palace precinct occupied the upper contours, ornamental gardens and orchards were on lower stage, and the great mosque, domestic houses of the court officials, barracks, mint, armoury, and baths were along the base. The Mosque, according to Maqqari (whose information he himself partly traces back to an architect employed at this site), was completed in 941 within a space of 48 days. It was a five-aisled edifice measuring 97x59 cubits with the central aisle one cubit wider than the rest; the whole was paved with reddish marble flags, and the minaret rose to the height of 40 cubits.

Rarely has a city enjoyed such a brief existence as this. Already in 1010 it was ransacked by Sunni rebels, and freely pillaged by souvenir hunters from then on. When Edrisi wrote (1154) the ruins were on the point of disappearing. And though it is derelict and unvisited today, systematic excavation has gone on for half a century, and has revealed much of the splendour and refinement of the age. Fortunately the marble pilasters (Plate 22a) of the basilical audience hall now partly reconstructed in situ have inscriptions that name the artificers and provide the dates (953–57). Badr, Nasr, and Tariq were the marble carvers, and these three together with Fattah were engaged on the carving within the Cordova mihrab of 965. One of the bases of the palace with the name of Abdal Rahman III dated 953–4 was the work of Saad.

Apart from the carving of which thousands of fragments were excavated, some unique geometric mosaic pavements were found. Stone and brick are manipulated to form chevrons, chess-boards, swastikas, stepped lozenges, concentric triangles, and overlapping squares. There are also some remains of geometric wall paintings. They evidently date from Hakam's time since the capitals found in this part are from 974–5. The decorated bases of columns have been shown to be Romano-Byzantine though the actual style of carving is Islamic. We know that the Byzantine Emperor Constantine Porphyrogenitus had sent 140 columns to Abdal Rahman III for the his palace; while envoys were sent to Tunis and Carthage to buy a further 1013 columns of the 4313 utilized altogether according to Ibn Adhari. Nevertheless, it would be difficult to deny that Moorish capitals had passed far beyond their prototype, and had little left in common with the Roman Composite or Corinthian types. They still had a double girdle of tipped over acanthus leaves, but the floral clump interpolated between the volute projections was stylized, and the abacus
(crowning slab) was often adorned with a Kufic inscription. Gone was the pulpy naturalism; leaves lost their protuberance, and fore-shortening was all but renounced. Instead, incision raised the flatly handled foliage out of the block and threw the interstitial background into shadow. Leaves are spayed into a fine skein of ribbons like delicate ivory work. Caulicolli (leaf nests), and volutes flow into one another with scarcely a break. Intricacy never relapses into disorder, nor is fragility obtained at the expense of firmness. We are indeed fortunate in having a sequence of dated Omayyad Spanish capitals from the year 932, 951/2, 952/3, 954/5, 956/7, 960/1, 964/5, 965, 971/2, 973/4, 974/5. Among the marble workers (al-raijam) one Fattah frequently occurs, while others who have signed their names include Safar, Nasar, and Muzzafar.24

Though Abdal Rahman's heart was in the splendid trappings of his courts and salons at az-Zahra, he did not neglect the Mosque which was regarded as a family heirloom to be embellished above all things wrought by human hands. He, at any rate, had time only to rebuild the minaret in 951 which still stands encased in the present belfry as we have already noted, and to reinforce the screen of arches opening onto the courtyard since they were beginning to lean forward alarmingly under the continuous thrust of the aisles. An inscription of his dated 958 suggests the latter work. It was his successor Hakam II who applied here all the resources of Cordovan art at the peak of its inventiveness. Incidentally it was al-Hakam who built the Castle of Gormaz in Soria in 965–6 which Maqqari attributes to him and which still exists.25 We are told that Hakam went in person to the Mosque to draw out the plan and set down the details of the enlargement with his jurists and architects.26

Once more the sanctuary was carried southward by eleven aisles—great compound piers being left to mark the old qibla wall and the beginning of the new extension. The re-entrant angles of the piers are occupied by nook columns which carry a cross screen of arches of double depth. These arches are of a multifoil variety with nine or eleven lobes, though for greater emphasis the median arch is composed of dual horseshoes framed by a festoon of twenty-one lobes. One of the arches in this screen is more extravagant still with its intrados carved into a rapid succession of comma-like curling loops. All these are but heralds of the fantasy to come.

In the sixth or central aisle at the start of the new extension is the so-called Chapel of Villaviciosa. It is a vaulted bay whose walls are open screens of complex arch forms carried on marble columns. An impatient traveller might only be baffled by the unregenerate confusion of criss-crossing lobes. A skilled observer, however, would detect various permutations of the lobed arch with the horseshoe; he would note the common denominator of cinquefoils wedged between the impost columns, and would follow the passing and bypassing of the two types of arches rising alternately from impost and keystones at the crowns of the load-bearing arches below.

The new median aisle is distinguished from the old by the fact that it employs brighter and gayer column shafts, masculine capital stripped of excrecences, and demi-octagonal impost shafts. The compartment bay preceding the sanctuary wall and the two bays flanking it are all of them vaulted over and separated from each other by the proliferated arch screens. Linking their columns was 'a wooden balustrade with extraordinary carvings,' as al-Himyari describes it.27 Within this enclosure or maqura was the Bayt al-mal, or treasure composed of the revenues of pious foundations (awqaf).28 This was distinct from the public treasury, khizanat al-mal, which was at the Alcazar.29 According to Edrisi the door to the left of the mihrab led to a room in which were kept the valuable utensils of the mosque and a venerable copy of the Quran associated with Caliph Osman, while the door on the right gave access to a passage leading to the palace. This was built by the ruler Abdallah (886–912), so he could enter without distracting the worshippers.30 It was a raised covered corridor that straddled the road which led to the bridge.31 Although we have a prototype in the passage which permitted the Syrian Caliphs to enter from the palace to the Great Mosque of Damascus,32 a more direct parallel was the raised covered passage connecting the Byzantine Chalke Palace to the south gallery of the Sta. Sophia.33
Moreover Charlemagne’s Palace at Aachen (c. 800) also had a long porticus connecting the regia to the chapel.34 The case of the Prophet’s Mosque in Medina is interesting for it had a locked trapdoor covering a subterranean passage which led out to the house of Abu Bakr.35 The Chao Ju-kua, intermittently describing the Romans (Ta-ts’in) and the Arabs (Ta-shih), says that a tunnel over a li long (1/3 mile) connected the hall of worship with the palace, and the king went by this way once a week to perform the divine service.36

Magnificent glass mosaic is encountered within the maqsura of the Cordova Mosque. We know that 320 quintales of glass cubes were sent by Nicephorus Phocas (963–89) from Constantinople. But the painted decoration on it is entirely Islamic since, as Ibn Adhari explains, Hakam’s craftsmen rapidly learned the technique from the Greek, and soon excelled their master whose services were then dispensed with.37 Fillet borders following the horseshoe of the mihrab arch, and also enclosing the spandrel areas, are of incized marble; these maintain a rigid sense of architectural form which glass mosaic tends by its very nature to annihilate (Plate 22b). The mihrab commands attention with its dull burning dazzle and miniature range of trilobes engaged above. This is the first appearance of the trilobe in the West, but unlike those at the Ashik Palace at Samarra (878) its lateral lobes are not suppressed. The mihrab is not merely a concave niche but an opening leading into a seven-sided grotto which is domed over by a large beautifully formed shell in stucco (Figure 23) (not in marble as is generally thought).

Anyone who knows that ribbed vaults did not become fashionable in Europe until the 12th century must be startled by the three ribbed vaults of the sanctuary bays at Cordova dating from 965–968. Of these the central one in particular leaves nothing to be desired. The square bay is converted

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**Figure 23 Cordova, the Great Mosque, plan of mihrab and maqsura (E. Lambert)**
into an octagon by means of cinquefoils thrown across the corners on the heavily moulded cornice line. Rising from the cornice between the squinches are clusters of column shafts. Some of these carry grilled clerestories while others support salient ribs of a square section. The ribs start two at a time, curve away to left and right as they rise, intersect their neighbours, and descend on alternate pedestal columns—thus forming an open-centred eight-pointed star. Within this is a shell resembling a flower in full bloom; it is in fact a small cupola. Its exterior is covered with roof tiles, as it was when Ibn Bashkuwal wrote in the 12th century. The whole transition zone is carved with freehand floral patterns, and every inch of the vault is apparched in a glorious wash of mosaic. The lateral vaults and the vault of Villaviciosa (PLATES 23, 24) vary point by point in the way in which the ribs are arranged, in the pattern and placement of the shells, and in the treatment of squinches and clerestories. The only resemblance is that on the exterior they are expressed as high pitched octagonal roofs of tile.

Lobed arches, shell ornament, gored ribs, and clerestory domes had all been combined at Kairouan, but the originality of Cordova is nonetheless remarkable for that. All the features have extremely good proportions, and a geometric analysis has been made. Most extraordinary are the intersecting ribs. The sudden appearance of architectural ribs in Spain has long been a puzzle to historians but the following theory may be advanced. That wooden roof construction has affinities with the building of timber hulls is no new hypothesis, but it is significant that exactly contemporary with the appearance of the ribbed vaults was the renewed spate of shipbuilding in Spain. In the year 968 Hakam ordered the building of ships on the model of the raiding Viking ships. Incidentally, according to the 10th century writer Ibn al-Kutiya, the Madjous had in a previous raid in 844 attempted to burn the roof of the Mosque of Seville, but only the parts actually struck with burning arrows had fallen. The constructional timber ribs of Viking ships elsewhere are still to be seen. The Moorish fleet with its 200 sea-going vessels became equal to that of the Fatimids, and enabled the Mediterranean to remain ‘a Muslim sea’, at least as late as 1048. Now a fact which must come as a surprise to those who have refused to admit any symbolism in Islam is that the sanction for exposing roof construction over the prayer hall came from no less an authority than the Prophet himself. When the mud covering the roof of palm branches at his Mosque in Medina was washed off by rain he forbade his followers to restore it in spite of considerable practical inconvenience. The explanation he gave was that it now gave the effect of the cradle of Moses. Even the lustrous shell dome behind the mihrab of Cordova appears to have been an idea derived from Medina since Ibn Abd Rabbih writing c. 900 describes the Mosque of the Prophet as having in the enclosed gilt gallery adjacent to the mihrab, ‘a roof in the shape of a huge concave shield like a mother-of-pearl shell’. My contention is made all the more likely by the fact that Ibn Abd Rabbih was poet laureate to the Caliph Abdal Rahman III at Cordova.

The heavy masonry walls of the Mosque of Cordova are badly weathered on the exterior, but after modern restorations it became apparent that they were almost as exuberantly treated as the inner sanctuary. They were crenellated in the usual stepped undercut manner, buttressed at regular intervals, and fenestrated with mantilla-like marble grilles (PLATE 25). Doors had alfiz frames with lozenge borders, while upper panels had round interlacing arches in particoloured relief. A notable feature of the relieving arches over the entrances is that they have vousoirs growing progressively longer toward the apex, a device which serves to exaggerate the horseshoe shape. A gay polychromy was achieved by the use of red brick and white marble inlay to from chequerboards, reticulations, and chevron vousoirs. Two of the doors once lead directly to an enclosure reserved for women, while against the great west gate al-Hakam had built alms houses. It was evidently not unusual for a portion of the mosque to be reserved for women. One such case was the Great Mosque of Medina as reported by Samhudi following Ibn Zubala (814); another was the masqura for women in the east side of the Great Mosque of Kairouan as reported by al-Bakri (1067).

Between 987-90 Almanzor decided to extend the Cordova Mosque eastward along its full length
for another eight aisles—so that now there were nineteen parallel aisles that loped away for more than thirty bays in a southerly direction (figure 24). The vista of 120 yards allows tedium to gather as you thread your way through interminable forest avenues toward the sanctuary end. Once you are half way down the sense of boundary remains: it is as if the verdurous oasis has become desert-sized itself. Arches sweep up and fall away like branches of a traveller’s palm. The tree trunk illusion is heightened by the sinking of the bases into the pavement. The arches are not of alternating brick and stone, but are only painted in this manner for the sake of consistency with the rest. Finally, in the Court which had trees planted in it since the 9th century, Almanzor built an aljibe, or underground cistern. This consists of nine bays on four cruciform piers.

The later history of the Mosque is not pleasant telling. After the reconquest of Cordova (1238) the Mosque was turned into a cathedral. In the 16th century it was decided to uproot scores of its columns to make way for a fastidious Chapel of the Canons which rises right through the roof. When Charles V discovered this vandalism he is said to have reproved the authorities: ‘Had I known what you were about I would certainly have forbidden it. What you are building now is banal, whereas what was there before was unique in the world.’ How relevant was the Quran’s prophecy (ix. 3a) not of course intended in this context, ‘the edifice they have erected will never cease to be a misgiving in their hearts.’ In 1713–23 the old ceiling of the Cordova Mosque was covered over by a whitewashed lath and plaster vaulting. This has now been partly removed, and an attempt made to restore the ceiling to its original condition, whereas some of the original beams carved with low relief patterns are now displayed round the Court of Oranges. Some panels bore inscriptions naming the carvers Ibn Fath, Rashiq, and Hatim. Edrisi had described the cross beams and nailed-on planks as pinewood from Tortosa painted with a variety of geometric and curvilinear designs in vermilion, lead white, lapis lazuli, grey green, and ink black. Gone also is the famous minbar which Edrisi said was incrusted with ebony, box wood and scented wood, and which took six craftsmen seven years to build. Nor is there a trace of the crowns of lamps whose number is variously estimated by Ibn Bashkuwal as 224, by al-Adhari as 280, and by Edrisi as 113 who says that the largest of them carried 1000 individual lamps, and the smallest a dozen. The visitor today will find that strips of the perimeter wall are allotted to such a motley gathering of saints that the only manner of finding one’s favourite patron is by referring to a guidebook index.

The general Almanzor, who was virtual ruler in the Caliphate of Hisham II (976–1013), had built a country residence called Munyat Al-amiriyya, where Al-Homaydi reports the stud of horses was kept, and where shields and weapons were manufactured. Its ruins were excavated at Moroquil 9 kilometres west of Cordova in 1910, but the proprietor destroyed the remains in 1926. The most interesting feature here was a trapezoidal pool 50 metres long and 28 broad. It was enclosed by a wall with engaged piers carrying a series of segmental vaults, though every alternating pier was corbelled in four steps from the wall. Almanzor also built a palace, the Madinat az-Zahira, on the bank of the Guadalquivir to the east of Cordova. This was erected in 978/9, but survived for only 30 years. Almanzor died in 1002, and, as a result of a revolt of the Berbers in 1008 under Muhammad al-Mahdi, the palace was sacked and orders were given to demolish it so that not one stone would be left standing on another. Thereafter Cordova lost its prestige which it was never again to recover. Today the visitor would search in vain for the 491 mosques which al-Bakri (1067) says there were in the city. One solitary minaret remains, a square tower with twin windows which has been converted into the campanile of the Church of San Juan.

Coinciding with the decay of Caliphal power, and the abolition of the Caliphate title in 1031, was the upsurge of the taifas or provincial dynasties, such as in Granada, Toledo, and Saragossa, the two latter succumbing to the Catholic reconquest in 1085 and 1118 respectively. Remnants of the Palace of the Zirid rulers of Granada survive in the Alcazaba of Malaga. Their polyfoil arches incrusted with carving are attributed to the ruler Badis between 1065–75. In
Toledo there survives the Mosque of Bib Mardom. It is a masjid rather than a Jami or congregational mosque, and previously it had been a Visigothic church when the Muslims conquered the city in 712. Above the triple-doored entrance are interlacing semicircular arches, followed by a cellular cross-hatched band of brick ornament between denticulated mouldings, and a brick inscription frieze still further above which says that the Mosque was built for Ahmad ibn Hadidi by his architects Musa ibn Ali and Saada in 999/1000 (Plate 26). Over the round horseshoe doors of the lateral façade are larger engaged semi-circular arches in rectangular frames, and above the filled-in window voids of round horseshoe form with flaming voussoirs are trefoil arches in relief (Plate 27). A break appears in the brickwork of the apsidal end, in the zoning of the composition, and in the features themselves, for the windows this time are of pointed horseshoe form and are encompassed by multifoil arches in relief. Leaving aside the apse which was a 12th century Mudejar addition, the remaining edifice resolves itself into nine bays, each covered individually by separate vaults. The central vault is carried on four Visigothic columns, and is raised higher than its mates by the addition of an octagonal zone above the mock triforium (Figure 25). The ingenuity and variety of the ribbed vaulting in this mosque is extraordinary (Figure 26), even if the workmanship be somewhat crude. One of the vaults forms a square with the ends of the ribs meeting the centres of the sides of the square bay; one has two pairs of ribs crossing each other axially; another has ribs starting from above squinch arches and forming a cross, while another has lobed tripod squinches with lobed arms of a cross starting from the angles of the inscribed square, others form stars with non-ending intersecting lines, etc. The ribs of the central vault form one star shape within another, and within the centre of the inscribed star rises an octagonal shell. It will be noted that there are three examples of ribs intersecting in the centre: the germ, in fact, of the quadripartite vault that later became standardized in Europe. Following the recapture of Toledo in 1085 this mosque reverted to the Christians. Other than this mosque, an 11th century horseshoe arcade on Visigothic columns preserved in the Church San Salvador, the Mosque of the Tornerias which is raised on the first storey and utilizes ribs in its central vault, and the Puerta
Visagra (Bab Shakra) (Plate 28), a clean sweep has been made of the pre-conquest buildings of Muslim Toledo. Of these the Gate is of masonry with blind decorative arches in long thin bricks. There is an upper chamber of rubble which is lighted by a register of segmental arched windows. Finally, spike-shaped battlements riddle the skyline.60

Meanwhile, the principality of Saragossa was coming into its own, and the Mosque and Palace of Aljaferia have been attributed to the reign of al-Muqtadir bin Huud (1049–81), who is known to have built a palace called Dar al-Surur or ‘house of joy’. This palace was rebuilt and occupied from the 14th century onward by Catholic kings, and has suffered not a little as a result. After the destruction of 1809 it was used as a barracks. Some of its arches and capitals are preserved in the Archaeological Museums of Saragossa and Madrid. Both features show a very considerable fecundity of invention. The capitals are generally twice as high as they are wide, the volutes curl over like rams’ horns, acanthus is palmetized and made to tip over like serpent hoods, conspicuous inscriptions adorn the abaci, and the whole surface is carved with a swirl of bifurcating stems and leaves (Plate 29). Cordovan arches are mere child’s play compared with the rococo arches of the Aljaferia. One of these is used a number of times in the palace chapel alternately as a blind arch and as a squinch. It is a simple curvi-angular design in which the lowest pair of lobes of the cinquefoil are retained, and the apical cusp transformed into an arrow head (Plate 30). The other type might be described as multi-mixtilinear, for it is even more eccentric and almost defies analysis.61a The result of the analysis at any rate sounds absurd: a series of cinquefoils stem from intersecting neuf-foils which in turn rise from every fourth cusp of a fourteen-foiled arch (Plate 31). In the spandrels and surrounds the complication is continued by incongruously placed interlocking braid mouldings, shell scoops, mock columns and alternately carved vousoirs. There is no evidence that European Baroque was influenced by Saragossan art, but the word itself is of Arabic origin, burga (meaning uneven surface) from which derived the Portuguese barroco (meaning irregularly shaped pearl).

The baroque of Saragossa was probably matched by the extravagance of Seville if we are to judge by the life of that Poet-King Mutamid (1068–91). The impending threat of the Catholic powers of the north compelled Mutamid to make the fatal mistake of inviting the Almoravid Berbers into Spain to his aid. Yusuf bin Tashfin did indeed halt the Christian advance by the victory of Zallaka (1086), but too late did Mutamid realize the inordinate ambition of the Berbers who contrived to overthrow him and send him away into ignominious exile.

With this entry of an African dynasty in Spain it becomes imperative to take into account the resulting cultural exchanges. But we must remember that already in Omayyad times the southern expansion of Hispano-Arabic art had become a manifest trend. We know for instance that an Omayyad governor built the minaret of the Mosque of Andalus at Fez in 956, while in its minbar the names of Hisham II and Almanzor are mentioned.61 Similarly, the minbar of the Qarawiyin Mosque in Fez is known to have been made by order of Hisham II in 1005.62 On the columns of the Kutubiya and Alcazaba Mosques at Marrakesh are Omayyad capitals which were undoubtedly imported from Cordova.63 A water basin in the court of the Madrasa of Ali ibn Yusuf in this city is known from the inscription to have been made for the son of Almanzor.64 Coming to Almoravid work we note that the African fortress of Tasghimut was built c.1125 under the direction of al-Falaki, an Andalusian immigrant.65 It is suspected that the Almoravid fortress of Amergo, which has north-Spanish affinities, was built under the direction of some chief of the Christian guard.66 We learn from al-Jaznai (1361) that Yusuf bin Tashfin brought artisans from Cordova for constructing some buildings at Fez.67 Another Almoravid ruler Ali ibn Yusuf (1106–43) is known to have employed Spanish architects to erect the bridge on the Tensift.68 It was already in Yusuf bin Tashfin’s reign that the finest Moroccan buildings were erected including the axial naves of the Qarawiyin Mosque in Fez (1135, 1143), and of the Great Mosque of Tlemcen (1136). But the
ribbed domes are not servile copies of Andalusian ones, especially the domes which are perforated, and the mukarnas cupolas appear earlier here than in Spain. The curvi-angular squinches and the corbels with curled-over palm leaves of Tlemcen are anticipated at Saragossa (Plate 32), though the first hint of such corbels is in the Cordova mihrab of 965. The polyfoil arch of Tlemcen is unusual in that its lowest lobes are serpentine form, or in the form of the reversed letter S, but this detail is also anticipated in the mihrab of the Great Mosque of Almeria which was founded by Abdal Rahman III 955/6 and enlarged in the reign of Zuhair (1028–38). The most splendid Almoravid work only became known recently through excavation. It is the Qubba of Ali ibn Yusuf covering a water basin near the Great Mosque of Marrakesh. It is set in the midst of a court along whose sides are latrines, while in the vicinity were found a fountain and a barrel-vaulted cistern. The shell treatment of the cupola and the intersecting polyfoil arches owe much to Cordova, but all the elements are imaginatively conceived. Moreover the carved zigzagged extrados of the dome has only African counterparts.

The second Berber invasion of Andalusia was that of the Almohads, when in 1147 Abd al-Mumin overcame the Almoravids. Almohad rule came to an end in Spain in 1212 at the Battle of Las Navas de Tolosa though the dynasty survived till 1269. Again the Berber rulers were dependent on the higher culture of Spain. We know from the anonymous Hulal al-Mawchiyya, written by a Spaniard in 1381/2, that Abd al-Mumin (d. 1163) made a vaulted passage between the Palace and the Kutubiyya Mosque at Marrakesh, and added to the Mosque a 6-sided maqsura, and in charge of the construction was a Spaniard from Malaga called al-Hajj Yaich, and he it was who constructed the fortress of Jabal al-Fath (Gibraltar). This latter was in 1160, though the Calahorra which still survives there dates from 1342–44. The same author tells us that Abd al-Mumin brought to the Kutubiyya Mosque a minbar made in Andalusia of pieces of wood from Khmer and red and yellow sandalwood and gold and silver ornaments. This ivory-inlaid minbar does in fact have an inscription which states that it was carved in Cordova. Then again we are told by Ibn Sahib al-Sala that the Almohad ruler Abu Yaqub Yusuf employed the Andalusian architect Ahmad ibn Baso for building a magnificent alcazar called the Buhayra in Seville in 1171. Some fortifications erected under the Almohads survive in Spain. At Badajos, which was built by the ruler Abu Yaqub Yusuf (1163–84), the principal gate involves a right and left turn, but bent entrances had already appeared in North Africa at the city of Ashir (974–77), a little later in the Ribat of Monastir, in the Moroccan fortress of Zagora (third quarter of the 11th century), in Almoravid Marrakesh (in 1120), and was first used in Spain by the Zirids of Granada (1025–75). Another interesting feature at Badajos, as in many other places, was a postern making underground communication between the castle and the country without passing the city. It permitted a besieged citadel to receive reinforcements, food and emissaries from outside, and has been called the Door of Treason. At Almohad Caceres are a number of albarrana towers, which are defensive towers advancing out from the curtain and joined to it with a short stretch of wall. Most of these towers are 4-sided but two...
are octagonal, and in the interior of one a pair of cruciform piers support vaults. A sort of exaggerated version of the albarra is the courasa, a word which comes from the Spanish Arabic qawraya attested in the 14th century by Ibn al-Jatib. The courasa has been described as a fortified spur more-or-less perpendicular to the curtain wall which either advances up to the side of a river (e.g., Badajos) or the sea (e.g., Malaga) for assuring in a permanent fashion free communication with them. The best known of such towers is the Torre del Oro at Seville which was built by the Almohad governor Abul Ula in 1220–21. It is a dodecagonal tower with a hexagonal stair-well in the centre surrounded by a groined vaulted gallery (Figure 27). High up on the exterior of the tower there is faience, which is the first example of its use in Spain.

We now come to the most important Almohad work, the Great Mosque of Seville, built where the Cathedral now is. It was the ruler Abu Yaqub Yusuf who delegated the architects Ahmad ibn Baso and Abdalla ibn Amr to build it in 1172–76. Little now remains of it but the blind pointed horseshoe brick façade with stepped cresting in the Court of Oranges, and two entrances, one covered with a mukarnas vault (Plate 33), and the other with bold stucco carving in the soffit of its arch. The bronze door of the latter has engraved floral motifs within hexagonal compartments, an openwork door handle with frilled outline, and lettering in Kufic with the formula ‘the Kingship is Allah’s.’ The minaret of this mosque now known as the Giralda was begun by the architect Ali of Gomara in 1189, and completed by Abul Laith as-Siqilli in 1198 (Plate 34). Stylistically it was a companion to its two contemporaries, the Kutubia Minaret at Marrakesh (1163–97), and the incomplete Minaret of Hassan (Plate 35) built for the Mosque with triple court at Rabat (1197) under Abu Yusuf Yaqub al-Mansur (1184–99). This ruler also built the walls and attractively carved gates of the city of Rabat. Excepting variations in total height and pattern of surface decoration, the main difference between the three minarets of square plan is that the Giralda is erected with brick (on a stone base) whereas the African minarets were of stone, ashlar at Rabat and rubble at Marrakesh. Apart from that all of them have plain unbuttressed edges that serve to dematerialize their bulk, all have patterned surfaces that increase in richness as they ascend—as indeed they should, and all have broad ramps on inclined planes instead of newelled staircases that zigzag to the top. The surface decoration is contained within sunk frames stretching the full length of the square shaft, and consists of a crochet-lace of mixtifoils. The fact that they rise from columns makes it possible to identify these notched lozenge repeats as none other than the foiled intersecting arches of the Cordova sanctuary screen, here prolonged and engaged to the walls. Storied voids, alternately cusped and horsehoe, not only light the interior ramp but afford vertical punctuation and relative scale. They lead out onto balconies which are protected at the Giralda with turned balusters. These are skilful Renaissance intrusions as is the whole of the superstructure. The original minaret was surmounted by a domed double-cube with a finial of four diminishing globes. We know this from a carved wooden altar retable in the Cathedral of Seville which affords a glimpse of the city as it was at the beginning of the 16th century with the Giralda, prior to restoration, rising high above. Moreover Yaqub al-Mansur’s Kutubia Minaret at Marrakesh rises 230 feet high and retains its original form. Since the superstructure of the Giralda collapsed in an earthquake, it was replaced in 1560–68 by a campanile of an entirely alien design. The difference lay not only in the pilasters, vases, and gables, but also in the more plastic handling, and in the size, shape, and ‘depth’ of voids. The last diminishing circular stage culminates in a weather-vane composed of a huge bronze figure representing Faith, for it was her fickle gyrations that suggested the name Giralda. Although the Cordovan Hernan Ruiz’s restoration reaches yards higher than the original, the proportion of the whole is by no means unpleasing. The Romanticism of the East and Classicism of the West are on the other hand not so happily juxtaposed.

The Berbers were stubbornly holding out as long as they could at Seville, and this meant that the prolonged siege was giving the Christian armies an opportunity to exterminate the agrarian
population. Ibn al-Ahm, the Yemenite founder of the Nasrid dynasty at Granada, acknowledged the suzerainty of Castille, and promised to aid with the Reconquest. His aim was not to sell out the Muslims, but to act as an intermediary thereby preventing needless massacres. Aided by him his overlord and ally Alphonso the Wise captured Seville in 1248. Ibn al-Ahm’s intervention earned him the gratitude of the saintly warrior-king, and the result was that instead of the Muslim hegemony in Spain coming to an end as it would have otherwise done, it was enabled to survive in the Granadan pocket for another two and a half centuries. At this time Andalusian artists were still sought after in Africa. Maqqari cities Ibn Said of the 13th century: ‘The present (Hafsid) Sultan erects buildings and palaces, plants gardens and vineyards according to the custom of the Andalusians. All his architects are natives of that country as are also his builders, carpenters, woodworkers, painters and gardeners. The plans of the edifices have been traced by Andalusians or copied from the monuments of their lands.’ Ibn Khaldun adds that at the Court of Mustansir (1249–77), the Hafsids, were numerous Andalusian poets, princes, and warriors who had sought refuge there. He also tells us that in building the houses, gardens, and palaces at Tlemcen the Sultan Abu Hammu I (1308–18) and his son Abu Tashfin (1318–37) asked for artisans and workmen from the Andalusian ruler Abul Walid Ismail I (1314–25). The Tlemcen palace does not now exist, but one example of Granadan influence has been noted in the wood-work of the cornice in the Madrasa of Abul Hassan at Salé (1333–41). In this town two of the Gates (1260–70) of the maritime arsenal were already constructed by a refugee from Seville. Finally, a Granadan artist Abu Ishaq Ibrahim as-Saheli was in charge of erecting the Mosque of Timbuctoo, that of Gao, and the palace of the negro king of Mali.

Ibn al-Ahm is said to have been fond of gardening, and may have founded the Generalife on the highest of the three hills of Granada. The reason for believing that it was founded early in Nasrid rule is that an inscription refers to a renovation in 1319 under Ismail. The garden is picturesquely situated against the perennial backdrop of the Sierra snows, and its towers and corridors enclose a long pool in which are jets of water. At least it is certain that it was Ibn al-Ahm who founded the present walls of the Alhambra in 1238 on the neighbouring hill. But there already was a citadel and fortress in Granada at the time. Edrisi says that the Zirid ruler Habbus (d.1038) fortified Granada, surrounded it with a wall, and constructed a fortress, and this work was terminated by his son Badis (1038–75). According to the Memoirs of the Zirid ruler Abdallah it was through the instrumentality of Badis’ Jewish minister Samuel ibn al-Naghralla that the fortress was built. The Alhambra, from the Arabic al-Qala al-Hamra or ‘the Red Castle’, derives its name from the iron-oxide which colours the soil which is employed in the tapia walls. The Spanish word tapia of which the Arabic is tabiyah, is described by Ibn Khaldun (Muq. ii 329) as earth and quicklime poured into a board frame and pounded with special mixers until they become one substance. This material appears to have been first used in Moorish architecture at the enclosure of Badajos by Abdal Rahman ibn Marwan al-Yilliqi in the second half of the 9th century. It next appeared at the Castle of Banos de la Encina on the road between Cordova and Toledo. An inscription records the erection in 968 by the general Maisur for Hakam II. Next, in the beginning of the 11th century the wall of Seville was built in it, whereas the Omayyad Governor Said b. al-Mundhir had built a stone wall round his alcazar (c. 913). Finally, a tapia wall was built at Almeria by Jayran al-Amiri (1012–28). The fact tabiyah (or western equivalent—pisé) was used as early as 761 in the base of the wall of Kairouan, and again in the Aghlabid residence of Abbasiya (801–77), leads us to query its origin. Here we will only note that in 36 bc Varro mentions a type of fence made of earth and pebbles in a mould which was found in Spain and in the regions about Tarentum, and also that Pliny described the very durable formaceum walls moulded between parallel wooden frames used in his day in Africa and in Spain.

The Alhambra is approached by a pebbled path that climbs steeply up an arboreal slope. The path makes a hairpin bend and drives straight into the
horseshoe cavern of a gateway. Continuing, it makes two right and then two left-angled turns, and emerges into the Palace enclosure. The entrance façade of this Gate of Justice has a hand carved over the exterior arch, as if to ward off the evil eye, and a key over the interior arch (see note on pp. 64-5).

On the left upon entering is the old alcazaba (al-Kasaba or citadel), with its straight square towers and spike-shaped battlements (PLATE 36). It was completed by Muhammad II (1273–1302). The interior passage of its Tower of Homage is covered by a cupola on squinches, which are in the form of a half-groin vault poised as if on the point of swooping down. Another tower, the Puerta de las Armas, again has such squinches, this time supporting a scalloped cupola. As this tower serves as a gateway to the palace, once again the passage turns in the interior and continues between walls encountering further turns at the upper end.

Beyond the now isolated Gate of the Vine with its polychrome tiles is the octagonal theatre chapel of Charles V. It is built on what is believed to have been the oldest portion of the Winter Palace, as is the Church of Sta. Maria on the base of the old mosque built by Muhammad II. (1302–08), which was paid for with tribute imposed on non-Muslims, according to Ibn al-Jatib. The eastern writer al-Umari (1297–1348) saw embedded hyacinths in its mihrab, and a minbar of ebony and ivory.

There was also a bath in front of the Church which can be reconstructed from remains. The Palace proper is now entered through the Hall known as El Mechouar, much altered in the 15th century, which can be identified with the maswar where al-Umari says the ruler gave audience to his subjects on Monday and Thursday mornings. On passing through the Patio del Cuarto Dorado (Court of the Golden Room), with its fine wooden corbelled eave, we enter the Court of the Myrtles and its contiguous parts attributed to Yusuf I (1333–54), (who also built the main entrance erroneously known as the Gate of Justice, but named in the dated inscription (1348) as Bab-as-Saria). Described in its bare essentials this is a long rectangular court in the middle of which is a green reflecting pool like a liquid mirror, bordered with hedges of sweet-scented myrtle (PLATE 37).

Entrances open on the main axis. That on the west side is preceded by an arched portico which leads into an anteroom known as the Hall of the Boat on account of its hull-shaped wooden roof which unfortunately succumbed to the fire of 1890. A doorway opens into a lofty and well-ventilated chamber covered with a marquetry ceiling. The bay windows of this Hall of the Ambassadors frame delightful panoramas. Also dating from Yusuf I is the sunk bath in the angle between the two courts. This second court is the Court of the Lions, and its surrounding suites of rooms were built by Muhammad V (1354–58, 1362–91). Around the court are galleries as well as a pair of projecting porches on the long axis, the latter feature being anticipated in the ruined Castillejo of Murcia attributed to Ibn Saad bin Mardanish in the 12th century. On the long sides of the court are upstairs apartments, and on the principal side a long hall spanned throughout with stalactite arches, popularly called the Hall of Justice. Channels in the pavement lead the water from the fountain to the centre of the four sides of the court.

So much for the essence of the plan. The decorative elements might likewise be reduced to avoid repetition. There are first of all the dadoes of glazed polychrome mosaic covering the lower areas of the wall. The Spanish word for these azulejos titles derives remotely from the Arabic azalaja meaning smooth and polished. The predominant colours of the glazed tesserae are royal blue, cinnamon yellow, apple green, ivory white, and jet black. They are either assembled into patterns of floating petal repeats which impart a stippled effect, or more usually into interlaced multisided figures made up of white enamelled shuttling lines woven round a star (PLATE 38); sometimes these are absent and the cut polygonal tiles are fitted closely together to produce geometric ensembles, often crested by stepped crenellated borders.

Next there are the low relief stuccoes covering the entire wall from wainscot to ceiling including the spandrels and soffits of arches. The stucco is most durable, being scarcely the worse for wear after six centuries. It is likely that the gypsum has been mixed with finely-sifted alabaster. Vitruvius (Bk. vii, ch. vi, I) already knew this technique for
he says that the salt-like transparent grains in marble when crushed and ground are extremely serviceable in stucco work. From remains of painting on the plaster it is evident that the Alhambra was richly coloured in red, blue, and gold. The patterns have been cast in moulds, and are not carved from wet plaster. Here are meander vines, rosette whorls, winged palmettes, cursive or braided inscriptions, scalloped shells, shield-shaped crests, and simulated colonnettes. They are contained within alfiz borders, medallion bands, or wavy cartouches. Their mechanical and almost stencilled effect on close examination becomes a hazy speckling from a distant view.

Thirdly, there is the mukarnas or stalactite, which as we shall note in due course, had a much longer history in the East, where it seems to have been evolved from a multiplication and diminution of the squinch niche. Having originated in Persia by the early 11th century it travelled westward with surprising alacrity, for already mukarnas cells of plaster are found in Algeria at the Qala beni Hammad before 1090, being found subsequently at the Capella Palatina in Palermo (1140), and in the nave of the Qarawiyin Mosque at Fez (1135–42). Here in the Alhambra it had already arrived at its most complex stage of development. The superimposed prism-facets of the stalactite are employed not only for converting the square into an octagon, but also for decorating the soffit undersides of arches, capitals of columns, and interiors of cupolas (possibly supported by timber struts behind). The aesthetic character of the stalactite is based on its cunning complication and utter defiance of gravitational law.

Finally, the marvellous ingenuity of the carved capitals proves that the Moor had not depleted his imaginative flair. Acanthus leaves are transformed into flat elongated U-shapes or variations upon them, and this whole zone is squeezed into a tight waist-band. In other words the head of the shaft is treated as part of the capital, so that the compact half cube capital block has a firm footing on the corolla of curled tips which project slightly forward. Volutes bifurcate in pairs and are turned over to resemble furled snail-shells. The abacus is decorated with a cavetto moulding followed by an interlace. Columns themselves are so slender that they are often twelve diameters high, as compared for example with eight diameters at Pisa. Some of the marble shafts have as many annular rings as a tree of the same girth. We are reminded of the new Kiosk (Al-Jausak al-Mudith) in Baghdad as it was in AD 917. According to al-Khatib writing in AD 1059, there were gilt copper rings encircling the 400 palm trees, each 5 cubits high, and enclosed from root to spathe in carved teakwood. These trees surrounded a tank 30x20 cubits with encircling conduit, while on four sides of it were pavilions with gilt seats. The columns in the Court of the Lions at the Alhambra are arranged in ones and two with tantalizing irregularity which produce the illusion of unbounded space beyond.

The Court of the Lions receives its name from the inscribed basin in the middle of the court which is supported on the backs of a dozen stiff and wooden-looking lions (Plate 39). It is conceivable that they were re-employed in the Alhambra from the old 11th century Zirid Palace in Granada, since the Spanish Jew Ibn Gabirol (b. 1022) in a poem describes a hill-top castle with gardens and a court of myrtles having also 'a phalanx of lions circling the base of the fountain.' It is suggested that the design of the fountain was conceived by the influential Jewish chancellor of the Zirid king, for the Bible describes the Brazen Sea of Solomon as having twelve oxen for supports. However it should be remembered that already at Madinat az-Zahra there was a fountain surrounded by twelve different animals in metal which were made in the local workshop, and the surviving aquamaniles of this time are vivacious and charming compared with the 'pasteboard dogs' of the Alhambra.

These beasts are not the only non-abstract motifs at this palace. In the vaults of the Hall of Justice are figure paintings on stucco-coated leather, and it is thought that they were painted by Sevillians in the period 1392–1409. One of these consists of a portrait gallery of Nasrid Sultans. Moreover, in the El Partal pavilion in the Alhambra gardens there was discovered in 1908 truly Arabic style paintings depicting domestic and military scenes in horizontal registers. Nearby is a small masjid with mihrab built by Yusuf I, and the Cautiva tower on the ramparts was also built by the ruler. Of all the fortified towers on the curtain
wall which serve as dwellings the finest is the Torre de las Infantas. This has now been attributed to the rule of Muhammad VII (1392–1408). A bent entrance with simulated brick vaulting in porch leads to a small court. This is covered with a light lantern, and is surrounded by galleries beyond which are balconies.

A word about the atmosphere evoked by the Alhambra. Clearly it is not the stern geometry of the ornament that steals the scene but impressions of seraglos with foam-white casements, elegantly marshalled columns in delectably capricious array, sparkling passages of light foiled against deep velvet shadows, fragile porticoes with their filigreed spandrils beneath massive towers, cramped corridors leading abruptly into wide expansive spaces, and long labyrinths of pillars that seem suspended from above. Almost everything contributes to the romantic effect—the minstrel galleries above the divan alcove in the subterranean baths, the haze of light streaming in through shell-shaped apertures of the caldarium, the vestibule pavilions with delicately blond columns carrying red tile roofs, the fused gallery of honeycomb arches in the Hall of Justice, the lattices with serrated windows, the patios containing within them a world full of silence and tinkling waters, and the inscription insignia that taunt the Catholic conquerors ‘There is no Conqueror but God.’ In the Hall of Abencerranges the square chamber becomes a star plan with the mediation of frozen stalactites, and through the star are glimpsed the myriad facets of a mukarnas dome. Long after it is seen the memory recalls the vision of a vast pomegranate shedding its ruby drops, and in the Hall of the Two Sisters (Plate 40) too the memory is impressed with the reminiscence of ‘a sky all flashing diamonds and prismatic radiance’, to borrow a phrase of Carlyle.

It used to be thought that there were few vestiges of Moorish architecture in Spain, but recent archaeological research has somewhat altered this view. We now have, for instance, a number of minarets. There is the minaret converted into the tower of the Church of San Jose in Granada, which has been attributed to the Zirids between 1016–38. Another contemporary minaret is at present the campanile of the Church of Santa Clara in Cordova. Other 11th century minarets survive at Almeria. Then there is the 12th-13th century Almohad mosque, the Hermitage of Cuatrohabitan in Bollulos de la Mitacion (Seville). It is triple aisled, and there is a freestanding minaret behind. There is the 3-storeyed tower in the town of Carpio (15 miles west of Cordova) dated 1325, whose zigzagged ramp continues the Giralda tradition. In the Muslim acropolis of Ronda is a 14th century minaret, not to mention a mihrab, and some houses—one with a fine ceiling. As for mosques, we have a partially preserved one from the 11th–12th century at the Hermitage of the Castle of Monastir la Real (Huelva) which has three aisles and a mihrab. We know from al-Himyari incidentally that Spanish mosque-cathedrals had the following number of aisles—5 in Algeciras, 3 in Cabra, 6 in Calsena, 7 in Carmona, 5 in Ecija, 5 in Jaen, 3 in Jodar, 5 in Malaga, and 5 in Tortosa. Among other mosque remains are an Almohad pentagonal mihrab (1157–1238) in the principal church of Mertola in Portugal, and a quadruplicate ribbed vault over a mihrab in the 12th century Mosque of al-Qanatir in the Church of San Marcos in Puerta de Santa Maria (Cadiz). To come now to secular buildings we may note first the 11th century Muslim houses excavated in Malaga. They include semi-detached types (i.e., two houses with a common wall), there is a good system for draining refuse water, and the walls have painted decoration, just as the Arab house in the west part of Almeria had dadoes painted with complex geometric designs. A number of Moorish baths too have become better known. There is the remains of a bath in Murcia in House 15 of the Road Madre de Dios; another bath at Torres Torres (Valencia); a 13th century bath a mile north of Alhama (Granada); A fair number of fortresses have been surveyed including that of Almeria, Guadix, Tarifa, Baños de la Encina and others. With extraordinary acumen 23 remote or deserted Muslim towns have been identified from remains and literary sources. Finally, Moorish and Mudejar buildings which have disappeared, but of which there exist early drawings or photographs, have been catalogued and described.
When the provinces of Muslim Spain were successively reconquered by the Catholic powers, the Muslim population continued to live on as subject races, and were either generously treated by enlightened kings or made serfs and slaves by bigoted tyrants. However, their indispensibility in the arts and crafts, as also in agriculture ensured them an important place in medieval Spanish society. The very fluctuation of their fortunes is indelibly written in the edifices they built for their masters. The Mudejar (a word deriving from the Arabic meaning ‘tributary’) style flourished contemporaneously with the Gothic. That two such contrasting schools could subsist side by side anywhere else in Medieval Europe would itself be surprising, but in this context they serve as a clue to the antinomious Spanish character. True, a whole building was seldom entrusted to a Muslim architect. Generally under the supervision of a Christian overseer he was assigned the cupolas and arches of a chapel, the façade and tower of a church, the ceilings and doors of a convent, or the walls and windows of a castle.

The Mudejars proved once again what superb effects they could produce given only brick, tile, stucco, and wood. It is fascinating to study how the decorative and structural forms evolved by one culture were adopted to the ends and purposes of another. The following resume of Mudejar architecture between the 12th and 15th centuries should serve to show both the widespread nature of their influence, and the broad extent of their repertoire. First of all in the sphere of painting we are fortunate in having documentary evidence of Moorish activity for their Christian masters. In 1157, for instance, Moors executed paintings in the Palace of Vilemajor, and in 1169 there is a reference to the painter Hali of Barcelona. Much later Mahoma Gali made decorative paintings for the Chapel of Sta. Maria de los Angeles at Saragossa, while in 1409 Mahoma Ramo painted the ciborium of the Cathedral of Saragossa. The brick porch of this Cathedral known as Pavorderia was incidentally added in 1498 by the Muslim architect El Rami. Other Muslim architects employed include Abdal Rahman of Segovia who worked on the Church of the Carthusians of Paular (1433–40), Maestre Hazan, who erected the Hospital of La Latina at Madrid, now demolished, Mahomat de Bellico of Saragossa who was engaged on the Chapel of the Trinity for the Countess of Barcellos in 1534, and Ezmel Ballabar and Maestre Monferriz who collaborated in 1504 with three Christian architects on the leaning tower of Saragossa which was pulled down in 1887.

It is in fact in the Province of Saragossa on scores of church towers that the finest examples of Mudejar brickwork are to be found. Here the detached belfries are most often octagonal with corner buttresses and are zoned by string courses. The intervening regions are treated with raised and recessed brick bonds forming chevrons, diagras, or basins of interlocking stars. Sometimes these are inlaid with white ceramic tiles as at Teruel, on the façade of the Presbytery (1402–13) of La Seo at Saragossa, (Plate 41) and in a cupola at the Convent of the Concepcion in Toledo (1422). A recurrent brick pattern is the mixtilinear grid, and an occasional one, as at the Church of Megallon, the stepped lozenge repeat. In Seville, the frame over the entrance of the Church of San Marcos seems to be directly inspired by the Giralda ornament, for here too are blind interlacing polyfoil arcades on columns.

Splendid instances of figured stucco work survive in the Monastery of Las Huelgas at Burgos, probably executed by captives taken after the defeat of the Muslims at Las Navas de Tolosa in 1212, or from the fall of Cordova (1236) or Seville (1248). Cloister vaults are overlaid with animals and castles in containing interlocked roundels carved in low relief (Plate 42), while a chapel has engaged screens of telescoped cusped arches, (Plate 43) an anteroom covered by three adjacent mukarnas cupolas, (Plate 44) and a domical vault on salient ribs forming a star (Plate 45). Such stellar domes of intersecting ribs occur elsewhere, as for instance, in the Church of San Miguel at Almazan, Soria; Church of the Holy Sepulchre, Vilenna (Navarre); San Pedro at Cordova; at la Seo, Saragossa (1520) (Plate 46), and Convent of the Santa Fe in Toledo (1266). In addition to this type there are the melon rind domes on gores of ribs, as at the Cathedral of Zamora and Salamanca, and the College of S. Maria la Mayor at Toro. Shell squinches occur in the cupola of the
Seo at Saragossa, and in the lantern of the Cathedral at Burgos; 141 while examples of the ‘swooping’ squinch are to be found at the Greater Church of Lebrija, at the Sta. Magdalene of Seville and at the Monastery of Sta. Clara at Tordesillas. Stalactite vaults formed by multiple cells are not very common, but one in timber was to be encountered in the Palace of the Infantado at Guadalajara, of 1480, which was unfortunately destroyed in the rebellion of 1936; there is even a stray example of the stalactite capital as at the tower of San Donizio at Jerez in the southern extremity of Spain. Stucco, however, was used more liberally in polyfoil windows with geometric grilles in Transitio Synagogue in Toledo (1357) built by the architect Don Meir Abdeil for Samuel Ha-Levi, Treasurer of Pedro I. 142 and in all-over floral and geometrical wall decoration, conspicuously at the Jewish Synagogue of S. Maria Bianca (c. 1270) (Plate 47) and the Casa de Mesa (c. 1400), the old palace of the Marquis of Malagon in Toledo, and in the Royal Chapel at the Mosque of Cordova, built in 1371 by Henry of Trastamare as a sepulchre for his father Alphonso XI, which also has a ribbed dome and wainscot revetment of azulejos tiles.

As for wood, it was used in several types of bizarre artesonada ceilings. Simplest of these was the one with cross beams carried on projecting wooden corbels, and the intervening portions treated as oblong compartments. Another more complex type has a vaulted form hipped at the sides and canted at the corners. A 15th century example of the latter may be seen at the Church of San Antonio el Real in Segovia, where the whole surface is covered with a geometric strip interlacing scattered at intervals with stalactite pendants. Even where the coffered type of ceiling is used, as over the throne room at the Aljaferia Palace in Saragossa, these flat laceria are nailed over the soffit of the beams so as to disguise them and within the coffers are set pendant pinecones. This ceiling is, like the best Moorish examples in Christian buildings, a product of the time of the Granadan conquest, and in fact dates from the reign of Ferdinand and Isabella. Another fine ceiling built by their councillor, Don Pedro de Mendoza (who was also Cardinal-Archbishop) at the Infantado Palace, Guadalajara (completed 1492), is of the vaulted type flatly groined at the ends and supported on a stalactite frieze. In the ceiling covering the dormitory in Granada of Isabel the Catholic of Portugal (wife of Charles V) not only are the laceria woven round stars attached to concealed beams, but an attempt is made to give a marquetry effect by means of black and white guiding lines. At her Franciscan nunnery of Santa Isabel la Real (1500–20) also in Granada there is a similar ceiling where a prominent feature is the tie beams pierced with geometric designs crossing the room. In later periods various types of ceilings described above continued to be made by architects who were Christian Moors or Moriscos, as is known to have been the case with the Casa de Pilatos begun in the early 16th century for the Ribera family at Seville. In Seville meanwhile the interior cupolas, for instance the Chapel of the Piedad (1415) at the Church of S. Marina and the Chapel of S. Pablo, were treated in a bold and exciting manner with laceria interlocked into polygons and stars, and with the conoid squinch fans adroitly fitted into the scheme. As for the names of Muslim woodcarvers working in Christian churches we know that Mahoma de Borja assisted by his two sons made the pews for the Cathedral of Huesca in 1401–5 (later replaced), while Ali of Ronda who was working at Saragossa in 1413–14 erected the Cathedral lectern assisted by Farrach of Ronda, Muca el Calvo, and Chamar. 143

There were other features in the Christian architecture of Spain that immediately stamped themselves as of Moorish origin. Among these are the interior fountain at the Convent of St. Isabella, Toledo, the alternating colours of the façade of St. Peter the Martyr, Calatayud, the spike merlons of the Monastery of S. Isidore del Compo, Seville, and the stepped crenellations of the Tower of San Catalina in Seville. And to conclude this brief catalogue we may mention some of the innumerable variety of arches which Muslim architecture was instrumental in popularizing. There were round horseshoe arches in relief on the tower and apse façade of the San Lorenzo Church at Sahagun; engaged intersecting horseshoe arches on the Convento Santa Fe in Toledo; serrated
arches at the House of Pilate, Seville; trilobed window arches at the church tower at Illescas, and Santo Tome, in Toledo; intersecting pointed arches on double columns at the unfinished cloister of San Juan de Duero in Soria (c. 1220); intersecting multifoil arches on the façade of the Gate of the Sun, Toledo, attributed to Bishop Pedro Tenorio, died 1399; and lastly that inevitable accompaniment of arches of every type—the rectangular aljizz border for example on the portal of the Church of San Lorenzo at Toro.

One other Moorish feature, polychrome faience struck the fancies of Christian and Jewish patrons. Pedro IV of Aragon had his palaces decorated with faience mosaic at Barcelona in 1367 and at Tortosa in 1370. Similarly, it was Sevillians who made the alcazado mosaic panels of the chapel of San Miguel in Saragossa Cathedral in 1378, and the Abbey of Santo Domingo el Real at Toledo in 1422. Glazed mosaic dados in Seville itself may be seen at the churches of St. Gill and also at Omnium Sanctorum, while at the Alcazar they reach a very high standard.

The Christian vogue for building palaces in the Moorish style gained strength when Alphonso XI built his Palace at Tordesillas in 1340–44. The entrance façade, a chapel, a bath, and a court have survived. But much better known is the Alcazar at Seville. Founded on the site of the old Berber palace erected in 1199, work was commenced on it in 1364 with the usual collaboration of Muslim architects, in this instance it is claimed of a Granadan sent by Pedro I’s friend Muhammad V (One master, Hali, worked here in 1372). Nor is the façade decoration of Pedro’s Alcazar, (Plate 48) dated by an inscription to 1364, inferior in variation and clear articulation of primary form to any part of the Alhambra. One enigmatic motif, perhaps based on the jagged notches of a key, which occurs on this façade within the inscriptive band above the balconied windows, has to my knowledge no other parallel than an identical contemporary motif from the portal of the Hospital of Muhammad V in Granada (1365–7) destroyed in 1843 but whose replica is in the Madrid Archaeological Museum. In the Alcazar (Plate 49) the rectangular galleries and uniform box saloons display a lack of imagination in planning; but there are some very varied faience dados, and walls and ceilings retain their polychromy. The great timber cupola over the Ambassador’s Hall erected in 1427 and rising two storeys in height is a tour de force of construction. Some of the woodwork at the Alcazar was executed by carpenters from Toledo. But the so-called court of the Virgin is saccharine with stucco trimmings which are prim with mechanical repetitions and made chunky with boastful escutcheons, no doubt as a result of the restorations of Isabel (1478–1504) and Charles V (1505–58). Apparently the new age of Reason could not interpret or understand the old age of Romance. Italian Renaissance came to oust Moorish and Mudejar styles which had already commenced their senescence. The surprising fact was that the fascination of these styles survived even up to the first years of the 16th century.

And while the battle of styles was being fought, the epoch of the Moors was coming to an end. For a long time the Kingdom of Granada had swayed on an uneasy keel. In the year of Columbus’ discovery of the New World (1492) this last stronghold was doomed. Unlike his brave commander who courted death outside the gates of the city, the insolent Boabdil held out for a time, and then surrendered to the combined Catholic powers, and rode away to exile. The fall of Granada spelled the end of the Muslim dominion in Spain. Cardinal Ximines took up the Inquisition, and banished half a million Muslim Spaniards from its shores. Five million more were to follow in the hundred years after.¹⁴⁴ The fertile soil of Andalusia grew parched and impoverished. The centre of authority swung northward, and the venture of the Moors was all but forgotten.

Note relating to p. 59
That the open hand talisman was prevalent in Spain is evident from the fact that its use was forbidden among the Moriscos in 1526 by Doña Juana and a junta of prelates, together with silver crescent amulets (Lomas, In Spain, 1908, p. 225; W. L. Hildburgh, in Folklore, June 1914, p. 207; and in Man July—Aug. 1942, p. 78). Hand amulets appear to have been in use in antiquity (G. Smith, Assyrian Discoveries, p. 78; Elworthy, The Evil Eye, 1895, p. 241, figs. 96–101; B. L. Goff, in Journal of the Warburg and Courtauld Institutes, XIX
nos. 1-2, 1956, p. 15) and have persisted to this day in
North Africa (E. Westermarck, 'The magic origin of
Moorish designs,' in Journal of the Anthropological
Institute, XXXIV, 1904, pp. 211-22; also Survivances
paiennes dans la civilization Mohometane).

NOTES

For further vestiges of the Saracens, see now, J.
Lacam, Les Sarrazins dans le Haut Moyen Age

2. For chronology and texts, see al-Sayyid Salem, in
Al-Andalus, xix, 1954, pp. 393f.

3. According to Ahmad ar-Razi of the 10th century
the original mosque had nine aisles and it was Abdal
Rahman II who added two others in 848. It has
been observed that the columns of these two aisles
differ from the others in that the modillons do not
have multiple lobes (E. Lambert, Art Musulman
1958 pp. 64-5, and 57, fig. 3). But see L. Torres
Balbas, in Al-Andalus, vi, 1941, pp. 411-22.

4. If the inspiration came from Roman aqueducts the
most likely one would have been the aqueduct Los
Milagros at Merida with its triple tiered arches
(see F. J. Wiseman, Roman Spain, 1956, pl. op.
p. 137) which, for example, Edrisi had seen and
admired (Description de l'Afrique et de l' Espagne,

5. For another view, its evolution through Roman
modillons, see L. Torres Balbas, in Archivos
Espanol de Arte y Arqueologia, 1946.

6. J. Sauvaget, La Mosquée Omeyyade de Médine,
1947, p. 105, n. 3. The same also is claimed of
Qasr al-Hallabat.

9. Von Oppenheim, Tell Halaf, p. 142; cf. Woolley,
Carchemish u. p. 149f.
10. F. Sarre and E. Herzfeld, Iransiche Felsreliefs, p. 3
ff. cited by V. Muller, in Journal of the American
87, 158, 165.
12. See in Van der Meer and Mohramann, Atlas of the
Early Christian World, 1958, fig. 413.
13. H. Basset and H. Terrasse, Sanctuaries et
Fortresses Almohades (Collection Hesperis, v,
1932), p. 112, fig. 36.
15. P. de Gayangos, The History of the Mohammedan
Dynasties in Spain i, p. 232.
16. Ibid., ii, p. 467.
17. Ibid., pp. 236-7.
19. Description de l' Afrique et de l' Espagne, tr.
Dozy, p. 263.
20. R. Amador los Rios y Villalta, Inscripciones
arabes de Cordoba, 1879, p. 227; L. Torres
Balbas, in Historia de Espana, ed. R. Menendez
Pidal, v, p. 475, n. 95.
21. M. Ocana Jimenez, in Al-Andalus, x, 1945,
pp. 154-59.
Fagnan, p. 282.
24. L. Torres Balbas, in Historia de Espana, op. cit.,
v, p. 668f.
25. Gaya Nuno, in Al-Andalus, viii, 1934, pp. 431-52
26. cf. Al Adhari, Bayan, ii, pp. 249-50; E. Lévi-
Provencal L'Espange Musulmane au Xeme siecle,
1932, p. 216.
27. Kitab ar-Rawd al mitar, ed. Lévi Provencal,
pp. 182-190; and Lambert in Annales de l' Institut
d' Etudes Orientales, iv, 1938, p. 75.
28. Ibn Adhari, Bayan, iii, 98.
29. E. Lévi Provencal, Histoire de l'Espagne
Musulmane, iii, pp. 32 and 133.
31. Al-Himyari, Kitab ar-Rawd al-Mitar, tr. Lévi-
32. Tabari, ii, 1790.
34. Ibid., p. 87. Other Medieval Christian examples
are also cited.
35. The Travels of Ibn Jubayr, tr. R. J. C. Broadhurst,
p. 201.
36. F. Hirth, China and Roman Orient, 1885, pp. 93-94.
38. L. Torres Balbas, Historia de Espana, ed.
Menendez Pidal, v, p. 538.
39. E. Camps Cazorla, Módulo, Proporciones y
composicion en la arquitectura califal Córdobesa,
Madrid, 1953.
40. cf. J. Strzygowski, Early Christian Art in North
Europe, 1928, e.g. fig. 65.
41. Ibn Adhari, ii, pp. 254-5, cited by R. Dozy,
Recherches sur l'histoire et la litterature de
42. Dozy, op. cit., p. 286.
43. E. Lévi-Provencal, Histoire de l' Espagne
Musulmane, i, 1950, pl. xiv.

45. This date marks the death of Mujahid, King of the Balearics, of whom Maqqari states: ‘As long as he lived, no Christian vessel dared furrow the waters of the (Mediterranean) Sea’. (History of the Mohammedan Dynasties in Spain, tr. Gayangos, ii, p. 257).

46. Umdat al-akhabar 81, al-Halabiyya, ed. Cairo, 1320 A. H., ii, 71; M. J. Karter (in Bulletin of the School of Oriental and African Studies, xxv, pt. 1, 1962, pp. 150–5) cites other variations of this Hadith. We know from the Bible that Moses’ ark was composed of bulrushes or papyrus reeds.


49. J. Sauvaget, _La Mosquée Omeyyade de Medine_, 1947, p. 50.

50. _Description de l’ Afrique Septentrionale_, tr. de Slane, 1859, p. 61.


54. See R. Velasquez, _Las ruinas de Alamiria_, 1926.

55. Ibn Adhari, _Bayan_, iii, p. 65; and Makkari, Anelects, pp. 387–8.

56. E. Lévi-Provençal, _La Pépinisule Ibérique au moyen age_, p. 189.

57. Manuel Ocana Jimenez, in _Al-Andalus_, 1949, xiv, pp. 175–83.

58. The Khazara Mosque of Deggaron in Bukhara district is distinctly related, for it has 8 parts round the central dome which is supported on 4 round piers. B. N. Zasypkin (Arkhitektura Srednei Azii, 1948, pp. 34–6) assigns this mosque to the 9th century, though 11th century would be more nearly right.

59. For roof plan and section see _Monumentos Arquitectonicos de España_; Toledo, Madrid, 1905, pl. opp. p. 103. Also see here a number of Mudéjar style buildings which are now generally inaccessible or have vanished. For San Salvador see pp. 437–9.

60. As on a contemporary Christian ivory, where there is portrayed also an upstairs gallery in the gate and a horseshoe entrance arch (J. Ferrandis, _Marfiles y Azabaches Españoles_, 1928, p. XLIX).

60a. Curious that Muqtadir was a mathematician besides being a poet and astronomer. (See M. Barrucand, _Moorish Architecture in Andalusia_, Cologne, 1992, p. 118–17).


62. E. Lévi-Provençal, _Inscriptions Arabes d’ Espagne_, 1931, no. 221.


68. Edrisi, _Description de l’ Afrique et l’ Espagne_, tr. Dozy, 1866, p. 79.


70. It is now the Church of San Juan. See L. Torres Balbas, in _Al-Andalus_, xviii, 1953, pp. 412–30.


75. M. Antuña, _Sevilla y sus monumentos arabes_, 1930, p. 86f.

76. Ibid., p. 87.

77. See L. Torres Balbas, in _Al-Andalus_, vi, 1941, fig. opp. p. 188.


82. Qirtas, tr. Beaumier, p. 345.

83. L. Torres Balbas, in _Al-Andalus_, ii, 1934, pp. 372–3.

84. H. Basset and H. Terrasse, ‘Sanctuaires et fortresses Almohades,’ in _Hesperis_, v, 1925, pp. 311–76.
89. Ibid., iii, p. 480.
90. L. Torres Balbas, in *Al-Andalus*, vi, 1951, p. 182, pl. 9.
98. Kitab ar-Rawd al-Mitar, tr. Lévi-Provençal, p. 26
102. *Rerum Rusticarum* i, 14, 4.
104. An isolated instance of such a squinch occurs at the church of S. Saturno, Cagliari in Sardinia, and frequently in Mudéjar monuments, as, for instance, at the monastery of Sta. Clara, Tordesillas.
105. A. Shaade, in *Encyclopaedia of Islam*, i, p. 278f.
108. Masalik el Absar....op. cit., p. 234.
117. L. Torres Balbas, in *Al-Andalus*, vi, 1941, pp. 62–70.
122. Ibid., ix, 1944, pp. 449–81.
125. L. Torres Balbas, in *Al-Andalus*, xx, 1955, pp. 188–95.
126. Ibid., vii, 1942, p. 420.
128. Ibid., x, 1945, p. 402.
129. Ibid., x, 1945, p. 164f.
137. For example in 1306 the architects Master Homa and Master Yahia took part in the work on the Cathedral of Seville, while other Moorish master builders are cited as having contracted to repair towers and walls at Seville in the 14th century (L. Torres Balbas in *Al-Andalus*, viii, 1943, fasc. 2, pp. 464–5).
139. M. Dieulafoy, *Art in Spain and Portugal*, 1913, pp. 139, 143, 150, 154 Muslim builders whose names have been preserved contributed the following; they reinforced the ciborium and lantern of Saragossa Cathedral (1403), built the Church of Cervera de la Canada (1426), repaired church towers and built houses in Saragossa (c. 1431), as well as roofs and chambers in its Town Hall (1467), erected the base of tower and façade of Tarazona Cathedral, the octagonal stage of the Church tower of Alfajarín (1485), a church in Epila and burial chapel of Pilar in Alagon (c. 1505), built and decorated the chapel of shells at the top of the Church of La Magdalene of Tarazona (c. 1515), and made the glazed tiles of the Cathedral of Huesca (1520–50). (See names in José Galiay Sarañana, *Arte Mudéjar Argonés*, Saragossa, 1950. See further José María Sanz, ‘Alarifes Moros Aragoneses,’ in *Al-Andalus*, III, 1935 pp. 63–87).
140. For a schematic comparison of the different types of ribbed patterns inspired by Moorish prototypes see L. Torres Balbas, in *Al-Andalus*, v, 1940, pp. 176–77.
141. Names of Muslim architects employed at the Cathedral of Burgos preserved in the archives include Muhammad of Aranda, Youza and Muhammad of Carrion, and Abdalla of Cordova. (Martinez and Sanz, *Historia del templo catedral de Burgos*, 1866, pp. 199–200; L. Torres Balbas, in *Al-Andalus*, ix 1944, p. 197).
144. Migrant Morescos have left their trace on the African Continent after their final expulsion following the edicts of 1609–11. The minarets with square shafts at Testour have octagonal superposed stages as in Mudejar towers, and one has a clock face following a Spanish precedent. The bay before the mihrab of the Great Mosque of Testour has a Renaissance domed lantern over a hemispherical dome, whilst over the mihrab niche is a broken pediment with three obelisks and an escutcheon carrying a blazon in the Italian Renaissance style (G. Marcias in *Revue Tunisienne*, 1942, pp. 147–70).
The architectural history of Islamic Egypt is capable of being understood only when we take into account the successive waves of influence that flowed into the capital immediately following each new change of dynasty. Perhaps no country in the world since medieval times can show such an unbroken series of rulers of foreign extraction nor such a spineless lack of popular resistance to them. In turn Syrian-Arabs, Turco-Iraqis, Shah-Africans, Atabeg-Kurds, Circassian, Turcomen, and Ottoman Turks shuttled among themselves this land of once age-long dynasties. The Persian traveller Nasir-i-Khusrau noted in his visit in 1048 that the Fatimid army of 215,000 men was chiefly composed of Berbers, Arabians, Sudanese, Nubians, Syrians, Turks, and Kurds. Indeed few other capitals had such a cosmopolitan population as Cairo, and it may be that the sense of being an alien hardly counted at all. Moreover, ever since its conquest the history of the whole country coincided in a unique way with the fortunes of this one city and its immediate suburbs. The question never arose of removing the capital to Alexandria which would have made it liable to naval attack, or building higher up the reaches of the Nile, which would have drawn it farther away from the focus of affairs east and west.

Until the decline of the Caliphate, the architecture of Egypt was subservient to the styles of the Imperial capital—first to that of Omayyad Damascus and then to that of Abbasid Baghdad and Samarra. The two congregational mosques that survive from these periods amply demonstrate this fact.

The Mosque of Amr, the conqueror of Egypt, was built shortly after he had taken Alexandria from the Byzantines in 641. The site chosen was Fustat ('tent'), situated ten miles north of ancient Memphis on the banks of the Nile. We know from literary sources that the original structure measuring roughly 90 feet x 60 feet had a low roof, was miserably ill-lit, and was not even preceded by a courtyard. When it was enlarged in 673 at the instruction of Caliph Muawiya, four flat-topped turrets were added to each corner of the roof following the example of the four pagan temenos towers at the Mosque of Damascus. As observed earlier these were the very first minarets actually built by Muslims. In 710 when the mosque was completely rebuilt, a concave niche was introduced as a mihrab. Only the Medinan mihrab pre-dated this. In 827 under the Abbasids this mosque received roughly a form and shape that survived until the end of the 18th century. There were seven aisles parallel to the qibla, which traversed a little over 300 feet, besides several aisles on the other three sides of the court, the bases of whose columns have been excavated in recent years. The ceiling was high enough to avoid a sense of oppressiveness and the interior was well aired and lighted by windows. On the exterior between these windows of faintly pointed contour were scalloped half-shells encompassed in shallow niches. Since the columns were still the short pillaged ones found ready-made, they had to be stilted precariously in order to obtain the requisite height. The instability resulting from this subterfuge was counteracted by soldering the arcades together with wooden tie beams embedded in the stilts. This succeeded in locking the arches together, but the net result was a vacillation between the two different moods of lintel and arch, and a heightening of ennui through indefinite repetition. Some of the carved wood architraves on the west side of the mosque with their conventionalized foliage date from the 9th century. Otherwise it is unnecessary to follow the subsequent history of this mosque as it is fraught with many abstruse archaeological problems of minor concern. Let it only be said that the pointed arch had appeared here by the first quarter of the 9th century.

The quint-point arch framing the discharging tube, as also the other arched recesses of the Nilometer
or Nile-measuring well on the island of Roda, were built in 861 by Ibn Kathir, an astronomer originally of Farghana in Turkestan, sent by the Abbasid Caliph al-Mutawakkil from Iraq. The tall graduated column in the centre of this well into which steps descend measured the annual rise of the river in flood season, for it was on the basis of this change in level that the agricultural tax was computed. As may be expected the idea of the Nilometer originated in Ancient Egyptian times, and is referred to in the works of Greek and Roman writers. Thus ancient Nilometers, though without the measuring column, survive at Philae, Elephantine, Edfu, Esna, Luxor, etc. It may be of interest to note that the 'Book of Canals', an investigation into the use of water for irrigation and laws for its utilization, had been written not long before in 830. Exactly contemporary with the Nilometer at Roda are the two immense open Cisterns of Kairouan (860–62) in Tunisia. Their thick walls are buttressed internally and externally with round topped hemicylinders (Plate 50). Kairouan deserved the epithet 'City of Cisterns,' given to it by Ibn Khordadbeh (846–85) for even before the Aghlabids the Omayyad Caliph Hisham and other princes had constructed fifteen reservoirs in the city.

Despite such occasional public works, it cannot be held that the Abbasid Governors of the Egyptian colony ruled with the interests of the people in their heart. Unfortunately they not only amassed personal fortunes, but they invested very little in permanent buildings serviceable to the community. So although Fustat perished due to a pestilence (1062–71) and a fire (1168) we may reasonably assume that the loss to architectural history, though deplorable (especially as regards the seven to fourteen-storey houses seen by Nasir-i-Khusrau in 1046) was not altogether drastic. It must also be remembered that the Muslim population of Egypt was still a minority for over 100 years after the conquest as forced mass conversions were absolutely unknown. These reasons help explain the dearth of monuments and slow progress of the early years.

Egypt's only hope of coming into her own lay in freeing herself from overseas control. In 868 there appeared a man capable of asserting the independence of the colony. He was Ibn Tulun, son of a Turcoman slave from Bokhara at the Court of Mamun, and he had received his deputy-governorship of Egypt for his brave action in service of the state. Once established, he not only broke loose from the Imperial ties, but gave Egypt possessions in Syria and Palestine. Through his actions he disproved the poet Mutanabbi's generalization that 'Arabs ruled by aliens never thrive'.

He built a hospital (873) (and we may recall here that Caliph Walid (705–15) had already set the example by having houses built for the lepers and insane), an aqueduct at Basatin (875) which still exists, a fortress on Roda (876), and founded a new suburb. This military suburb, Al-Katai (972) had seven gates leading to the Castle, one of these surmounted by two lions in plaster was named the Gate of the Lions. Here in this suburb in 876 he commenced building a mosque after the fashion of those he had seen while receiving his military training at Samarra and while residing at Baghdad.

Like the square Mosque of al-Mansur in the centre of the Round City, the Mosque of Ibn Tulun (876–9) had five aisles on the qibla side and two on the other three sides. Similarly it had the Governor's residence attached to the South side—which has, however, long since disappeared. Since Mesopotamian mosques were rarely built on arches, Tulun followed the Mosque of Amr by arranging his arcades parallel to the qibla wall. Whether or not the stucco grilles of the Omayyads had become current already in Egyptian domestic architecture, it is at least certain that Ibn Tulun employed them in his Mosque to reduce the glare from the continuous range of windows in the perimeter walls. Some of the surviving grilles tracercied with interlacing trefoils, quatrefoils, hexagons and circles date from the first building of the mosque.

Mesopotamian influence in the Mosque of Ibn Tulun is nowhere more obvious than in the extensive use of brick, the more so when such excellent stone was available in the Mokattam hills hard by. Similarly, the use of a ziyada or outer enclosure once again suggests Samarra. The purpose of this feature was both to provide an area for informal activities, and to cut off the mosque
from the din and bustle of the bazaar. However, so as not to make it entirely remote from the city, numerous entrances were left in the enclosure wall opposite the many entrances to the mosque proper. Two other features will be readily recognized as of Samarran provenance; the continuous succession of recessed roundels in squares forming a frieze along the uppermost part of the wall, and the fluted hood niches (here of gypsum) inserted between the windows (at Samarra between the piers). But there is no servile copying. At the Mosque of Ibn Tulun on the interior façade they are transformed into rosettes grooved in the form of shells (Plate 51). Samarra is again the model for the flat slab piers with colonnettes engaged like tree trunks on to the cut-away corners, and the hand-carved plaster ornament. The stucco is applied in floriated brocades of diverse patterns to the soffits of arches, to the archivolt, as well as to the bellshaped capitals of the nook columns. Between the pointed arches, which manifest slight signs of being extended into horseshoe curves, there are miniature arched openings. These serve to economize materials and relieve something of the overhead load on the piers. They are reminiscent of the tubes in the haunches of Mesopotamian barrel vaults.

It is likewise apparent that the minaret of the Ibn Tulun Mosque was fashioned after the Malwiya of Samarra with a corkscrew ramp spiralling round the tower. This is evident in spite of the unworthy rebuilding of the upper stages and the square salient base by the Mamluk Lajin in the 13th century. The Mosque is 175 yards long, there are a mile and a half of Quranic inscriptions carved on a wooden frieze just below the ceiling, and the court is two acres in area. The present fountain in the centre of the court is a restoration of 1296. The original gilt cupola on columns built by Ibn Tulun and destroyed in 986, is known to have played solely an aesthetic and symbolic function for it is stated to have been ornamented with the signs of the Zodiac,\(^8\) and the ablution tanks themselves were placed in the outer enclosure to prevent pollution. Muqaddasi says that this domed fountain was constructed on the model of that of Zamzam in Mecca,\(^9\) but whether this was so or not\(^10\) the practice of having domed baldachins in open forecourts was known in early

Christian basilicas. e.g., Constantine's St. Peter in the Vatican, which, as Paulinus of Nola tells us (Letters, 13, 11–15) served to give decorative shelter to the ablution fountain. Without doubt the most novel and intriguing features of the Mosque of Ibn Tulun are the pierced crenellations that completely surround the building on the summit of its enclosure wall (Plate 52). They have no antecedent. I have analyzed their form and meaning intensively and come to the conclusion that these merlons are a caricatured barrier of guards with their arms linked at shoulder, and that they have a talismanic function. Conceivably they were designed by the native Coptic prisoner who Maqrizi says (ii, 265) sketched the design of the Mosque on parchment, for which he was freed and given a pension.\(^10\)

The Mosque of Ibn Tulun was for a long time in a sad state of disrepair, and no wonder for it had been used at various times as a madhouse, a pensione, a stable, and a bakery. The traveller should not expect to see a myriad flickering lamps and puffs of amber cloud stealing along the chamber floor, or he will be severely disillusioned. He may, however, understand the cause of the subsequent neglect if he bears in mind the fact that twenty-six years after the completion of the Mosque, the Tulunid dynasty collapsed, and Ilkshid Governors sent from Baghdad once more resumed the Imperial rule. Their first act was willfully to destroy the Tulunid Palace adjoining the Mosque. We know this Palace to have been enlarged by Ibn Tulun's pious though sensuous son Khumarawaih (884–95) in a most extravagant fashion.\(^11\) He had turned the polo maidan into a garden planted with rose bushes and formal beds of flowers, and with rare grafted fruit trees whose stems he had coated with sheets of copper gilt. Leaden pipes supplied the water drawn by waterwheels to the canals and fountains. A pigeon tower served as aviary for a multitudinous variety of birds, while his menagerie was stocked with lions, leopards, elephants, and giraffes. In front of his Golden House he had made for himself a lake of quicksilver 50 cubits square, and here to cure his insomnia under the advice of his physician(!) he floated on an air mattress which was moored to silver columns guarded by his blue-eyed lion.
Within the palace, as we have noted before, he set up a wooden statue of himself wearing a golden crown, and others representing his feminine entourage all painted and dressed in a faithful manner.

Meanwhile, a new power had sprung up in the West. The Shi'ah followers of Ali had not been idle, and their missionary propaganda and subversive activities organized from Mesopotamia bore fruit at last. The state of Aghlabid Tunisia was undermined, and the Fatimid dynasty was installed in its place. The name of this dynasty was derived from Fatima, daughter of Muhammad, and the wife of Ali. To celebrate the event a new capital was founded at Mahdia in 916, and a small harbour was built. Its fortifications were blown up by Charles V in 1553, leaving only a fragment of a tower and some column bonds let into the masonry at the port. The Mosque of Mahdia, though renovated in the interior, still has its old monumenal entrance of 912, consisting of a projecting tunnel vault preaced by a horseshoe arch reminiscent of an enlarged key-hole, while a square minaret shaft terminates either extremity of the front facade. Both the projecting entrance and corner towers may have been suggested by the fortified palaces of the Omayyads, and we shall encounter these again presently in Egypt.

The Fatimids were too ambitious to be contained in a narrow strip of the North African coast. Gradually they extended their dominion over the whole Southern Mediterranean region, even occupying Sicily for a number of years. Westward they had to make a stop for they could never hope to dislodge the Spanish Omayyads. To the East they knew there lay a weaker opponent now suffering from floods, famines, and internal dissent. Against them the Fatimid armies had no great difficulty in obtaining swift victory in 960. The first act of the Sicilian commander Jauhar was to build on behalf of the Fatimid Caliph Muizz a new city near Fustat (and so placed to defend the latter against the Carmathians), by the name of al-Kahira, the Victorious. The foundations of the enclosure wall forming a rectangle three-quarters by half a mile was literally laid overnight. Large mud bricks were used, the wall was sufficiently thick to permit two horsemen to ride abreast on it, and there were seven gates. When completed (970–3) it continued to serve as the royal preserve for a privileged few with self-contained amenities, so that it had little direct effect on the populace. When the people eventually flowed into the enclosure at the extinction of the dynasty in 1171, the majority living in the palace are stated to have been eunuchs and women. Of the two palaces within, the greater one in the east was the Caliph’s residence together with that of his slaves and harem, and the lesser one to the West separated by a north-south artery was for recreation and overlooked gardens. A subterranean passage connected the two palaces so as to keep the Caliph secluded from the sight of his subjects, as Maqrizi says. The Eastern palace was composed of ten pavilions guarded by nine gates, of which the principal, the Golden Gate, was the one by which the officials entered on reception day. Two great halls, one of them domical, served for receptions and for banquets. In the great iwan of al-Aziz was a throne canopied by a tri-domed enclosed baldachin called a ‘sidilla.’ It was preceded by a protective grille and curtain screen which was drawn back dramatically to reveal the Caliph enthroned in splendour. Later, Alfadl (d. 1121) had a group of automata installed which consisted of statues of singing girls in musk and in amber who bowed as he entered the threshold and stood erect as he took his seat—a different version, in fact, of the statues of lions which rose and roared when the Byzantine Emperor Theophilos (c. 835) received ambassadors seated on his golden throne. A glimpse of the pleasures of Fatimid court life is preserved in the carved wood beams from the Western Palace begun by al-Aziz (975–96) and completed by Mustansir (1058–65). This woodwork portraying kneeling lute players strumming to attentive masters, dancers, revellers, and hunters pursuing hares and gazelles, had the fortune to survive since it was re-used later in the Hospital of Qalaw, which was built on part of the palace site. Nasir-i-Khusrau, who was in Cairo in 1049, says that the throne, which occupied the full width of the hall, had three of its sides in gold, and there were on it hunting scenes, racing horses and other subjects. We know that apart from the palace itself and the enclosed courtyards and dwelling rooms there was
a meeting hall for religious propagation, offices for ministers, a University known as the House of Wisdom (established in 1005 by al-Hakim), and a Library contained in 40 rooms, not to mention numerous shops, treasuries, kitchens, mills, granaries, and stables.

Apart from their Palace the general Jauhar built the Al-Azhar Mosque in 970–72. Initially the Mosque was simply designated Jami al-Qahirah, and its appellation which meant ‘the Splendid’ came within the course of a century. The Al-Azhar was converted into a theological school in 988, and thus it has remained to our own day with some changes in its curriculum. Unfortunately its prestige was such that every enthusiastic builder-monarch was bent on leaving some part of his work in it. It should not surprise us then that the entrance portal of this still most revered institution of learning in the whole world of Islam was constructed in the 18th century in a Gothic style with recessed multiple round-headed arches flanked by clustered shafts. As if approaching by deferred stages the original truth, a passage leads to another portal, this time a loftier one of 1468. At last you are ushered into a courtyard which seems to you spick and span until you learn to your dismay that it was reconstructed as late as 1892. Ignoring the plethora of minarets, all dates and styles, rising behind you, you cross the court and sigh with relief to find that the original sanctuary is almost intact.

The plan is a combination of earlier types. There are to begin with five aisles parallel to the qibla wall as at Ibn Tulun. Then there is a transept that cuts through them in the middle and leads from the court to the sanctuary wall as at Damascus. And lastly, the transept is wider than the aisles, its arcades are carried on coupled columns, and it culminates on either end in a bay carrying a dome as at Kairouan. Although the old qibla wall was pierced and the aisles continued beyond it in 1753, the original mihrab still remains in situ and is covered with carved stucco, while scrolling and meandering vines ending in half palmettes together with tree motifs and inscription texts are applied to arch spandrels and window panels.

The first Fatimid Caliph Muizz (953–75) had devoted himself to stabilizing the new state, and this had enabled his son Aziz to enjoy a period of peace and prosperity during his reign (975–996). But when Hakim came to the throne (996–1021) the heavens parted wide and the horrors of Pandora’s box descended on Kahira. Night was literally turned into day, and men ventured out with fear in their hearts wondering what new scheme would enter the mad king’s mind. The scourge was lifted when one night, shortly after having declared himself a deity, Hakim vanished mysteriously while riding his ass in the hills.

The Mosque that is known by Hakim’s name today was really begun by his father Aziz except that the arches were built on stocky Tulunid piers instead of on columns. The transept was raised above the general roof level and was apertured with clerestory windows (Plate 53) as at the Aqsa in Jerusalem. If the Azhar is only suspected to have had two lateral domes on the corners of the qibla wall in addition to the central one over the mihrab, it is absolutely certain that the Mosque of Aziz had such an arrangement, and they were borne on squinch niches. So as to equal the dignity of the sanctuary end Hakim ordered in 1003 an entrance wall with two terminal minarets, and an imposing masonry gateway projecting from the middle as at Mahdia. The north minaret was built in the form of a cylinder (on a square base), but this being inapposite to the rectilinear nature of the rest, the second one on the west corner was erected on a square substructure which changed to an octagon when the height of the wall was reached. Later in 1010 the disparity between the two minarets was concealed by building square salients round them (Plate 54). As if this was not enough, in 1087 when the walls of the city were extended so as to skirt the Mosque, the north minaret was encased in a second enormous salient whose sides measured over 80 feet but extended only up to the height of the mosque façade. Needless to say the heavily corbelled and scalloped minarets which rise out of the heart of the two salients are later work as is apparent from their style. They were built after the havoc-wreaking earthquake of 1303 which brought the Mosque to its present state of dilapidation. The walls, however, still retain much of their pierced and instepped crenellation, and the entrance and
minarets much of their bas-relief floriated Kufic friezes, interlineated upended plaques, and decorated string course mouldings. There were at this time 800 mosques in Cairo, as a census taken by al-Hakim revealed (Maqrizi, iv, 264).

So far in our narration we have only encountered one mausoleum. It is evident that the practice of celebrating the mortal remains of man was not particularly encouraged by the religion of Islam. One of the Hadith or Prophetic sayings coming down through the Caliph Ali, whether authentic or not, is typical and worth quoting: 'Shall I not give you the orders which the Prophet gave me, namely to destroy all pictures and images, and not to leave a single lofty tomb without lowering it to within a span from the ground.' For two or three centuries after the Hijra, Caliphs were buried in the humblest fashion, and it is said, some even took pains to conceal their graves. The first mausoleum known to us through literature was built by the Abbasid Caliph Mamun in 818. This was for the Imam Ali ar-Ridha who was buried next to Harun al-Rashid in Tus. If Tabari's report is reliable in what we have just related then the Qubbat-as-Sulaibiya in Samarra (862) could not have been the first mausoleum in Islam, though it is the earliest surviving. It was some time after 834 that teak-wood domes were built over the shrines of the Imams Musa and Muhammad at Kazimein. Over the grave of Ali, which Harun al-Rashid had accidentally discovered on a chase in 791, there was erected a shrine or mashhad, which became a place of visitation. According to Ibn Haukal (163) the Shahieh Abul Haija (d. 929) of the Hamdanid dynasty built over Ali's grave a qubba resting on four walls with a door in each side. The Buyid ruler Adud ad-Dowlah erected a mausoleum here at Najaf in 997, where he himself was later buried and around which a town grew. The same ruler had a monument built over the grave of the martyr Husain at Karbala in 979 as noted by Istakhri and Ibn Haukal. These buildings have not of course survived, and the plans of the present buildings, for example at Karbala and Najaf, though basically in the form of a shrine surrounded by an ambulatory, have a quite different effect from the Abbasid tomb at Samarra.

From such a beginning the Fatimids of Egypt, with the spectacular examples of the Pharaohs constantly before their eyes, lavished much of their architectural energy in enshrining themselves and their families. Such was their eagerness to leave their mark on the earth's archives that whole cemeteries were filled with canopy tombs. In this connection it is significant that the word for these qubbas, as they are known, was derived from the Aramaic qubtha meaning 'vault of heaven'. The dome was certainly a closer description of the heavenly vault than the tent erected over the graves of pre-Islamic Arabs, or their portable leather tents used as shrines and known as al-qubba. Later, in c. 1540 we actually have an inscription on a mausoleum covered by a dome of 48 feet diameter which is described as 'throwing its shade over us like high heaven'.

If the sequence of its monuments is interpreted correctly the Fatimid Cemetery at Assuan reveals how during the course of the 11th century the cubical substructures of the tombs which began by having arched openings on all four sides, thereby inviting the gaze of every passer-by, gradually sealed up the surplus entrances and became gloomy inside. To rectify this undesirable result clerestory windows were introduced in the octagonal drum. One of the distinguishing features of the provincial Fatimid mortuary style was that these drums were expressed on the exterior as concave planes. This however is not the case with the four mausolea south of Fustat, known as the Saba Banat (Seven daughters) (1010), whose domes have unfortunately collapsed. In the Assuan tombs the transition from the chamber to the drum is effected by hood niches, pendentive-cum-squinches, and even by the antique method of flat corner slabs. Where the plaster has fallen it is possible to discern that the domes are composed of baked brick, though in the walls so much mud brick has been employed that decomposition has resulted. These domes vary in shape from slightly stilted types with pancaked crowns to hemispherical, scalloped, and ovoidal forms. The arches are of the four-centred Raqqa type which are transformed in the later examples into keel-shapes, that is the curve becomes sharper at the spring and is continued to the apex by a straightened line. The alarming
change of direction from the stability of the vertical to a slope approaching the right angle is compensated by attractively carved reinforcing wooden ties.

The little private Mosque of al-Guyushi (1085) of unusual plan, (Figure 28) situated on a cliff high above Cairo, has domes over the sanctuary and over the square minaret shaft, both of which resemble the qubbas of Assuan. This minaret, which is above the mosque entrance and is of stone in the lower part and brick in the upper (as is the rest of the building), is rather similar to the minarets of Kairouan and Sfax, and very different from surviving Fatimid minarets in other parts of Egypt. These others near Shellal and at Esna (1077–81) have square substructures of varying lengths followed by tapering cylinders mounted by one, two, or even three polygonal stages of uncomfortable proportions, the last of which supports a cupola. The poor proportions of these minarets suggests that there could have been no conscious attempt to copy the Greek Pharos lighthouse of Alexandria which the Arabs regarded as one of the Wonders of the World and which survived until the 14th century. As measured in detail in 1167 by Ibn al-Shaikh of Malaga (a literary research scholar and supervisor in the construction of mosques), each of its successive stages diminished almost exactly by half; but what is perhaps more significant, the three sections, according to our author, were square, octagonal, and cylindrical as in the Egyptian minarets of Mamluk times.

At the Guyushi minaret a double row of mukarnas cells serves as a crowning moulding (Plate 55); it results in corbelling the cornice slightly outward. This is the first instance of this ornament in Egypt, and as such points directly to the influence of Persia where one example of mukarnas corbels supports the balcony of the cylindrical minaret of Baku dated 1078/9.

At the Guyushi Mosque the pair of domed kiosks above the exterior buttresses (Plate 56) may conceivably have been connected with astronomical observation since the Fatimid minister Afdal who created the observatory of Cairo in AD 1119 is known to have had it transferred to this very mosque. Previously, at the Mosque of al-Filat Maqrizi tells us that the great circle of 10 cubits diameter which was made in a mould had been placed on its terrace. The crenellations at the Guyushi Mosque which are like inverted arches may, therefore, possibly symbolise arcades resting in the sky. The punctured jewel-like stucco in the spandrels of the mihrab arch differs in style from the Azhar ornament on account of the freeing of stalks from the adjacent contact leaving a visible background, as well as in filling the outlined leaves and flowers with punched geometric patterns that have nothing to do with their plant origin.

Many Persian Shi’ahs must have emigrated to Egypt after the coming to power of the orthodox Seljuks in 1038. In the restoration of the Azhar court façade (1130), their handiwork is again suggested. The dome that was placed on the first bay of the transept facing the courtyard as at Kairouan has a meandering stucco inscription band girdling its interior (Plate 57) which is derived from the Mas’jid-i-Jami of Qazvin (1116), and ultimately from one of the plaster dadoes at the
Throne Room of Samarra (836). A star crowns the nadir of the dome, as if it were a bowl of the sky. At the Mausoleum at Qus (c. 1130) star apertures are perforated all over the dome in a further fulfilment of this idea, giving the effect of a planetarium. The author of the History of the Maghrib says that in the year 1118 when he was in Egypt he saw there a house of carved marble with the drawings of the spheres and the stars and all the climes. The present court elevation of the Azhar resembles only approximately the restored façade (Plate 58) that survived in a tattered state until 1892. The arcades of keel arches were strengthened by tie rods, and had roundels enclosing alternately tear-drop and lozenge petals above each arch. Between these medallions were scalloped arch frames. The wall was crested with an openwork star and hexagon brocade above which were pierced instep crenellations. This whole crenellated crest range rose as it came before the dome as if in homage—forming a frontispiece known in Persia as a pishtaq.

Another feature that gained added importance under the Fatimids was the conch. In the mihrab of the Tomb of Umm Kulthum it flowed out like sun ray flutes from a central spiral boss, as also in the five mihrabs of Sayyida Ruqayya (1133), though here the rays were held captive by concentric rings of cells. The scalloped shell had already played a conspicuous role in the façade of the Mosque of al-Aqmar (1125) above the joggled arcuated lintel, and again repeated in miniature at two adjacent levels (Plate 59), and in the two wings—one of which was hidden by encroaching buildings. The ribs radiate from a carved medallion; of these the main one over the entrance is composed of concentric bands pierced right through, with the name of Muhammad and Ali in the centre. As the ribs of the latter curve forward, they are cut off flush with the façade and are carved into frills. Due to the siting of this mosque between narrow alleys the visible left corner of the façade has been chamfered, and a double register of mukarnas cells, employed to join the lower canted with the upper advanced level of the walls. Due likewise to the parallel placing of the mosque front with the street outside the vaulted entrance passage is made to change direction slightly so as to become aligned with the sanctuary. (Figure 29) Finally, one notes the bold bands of Kufic following the progressions and regressions right across the exterior façade. Of course lettering had been used in this monumental manner, for example in the court façade of the Great Mosque of Susa (850) in Tunisia where the plane of the frieze was curved obliquely to enable reading from immediately below.

The scheme of ploughing up the exterior face of the walls was managed at the Mosque of Salih Talai (1160) by means of broad pilaster strips alternating with sunk arch frames, a scheme that was destined to be standardized in Egypt. The other innovation here is that the whole building has been raised on a lower storey of vaulted shops so as to bring the sanctuary up to street level. As for the portico (Plate 60) in front of the entrance (portico in antis) it occurs previously in the Mosque of Bu Fatata in Susa (838–41). The Mosque of Salih Talai has been rescued from oblivion by being drastically restored excepting the prayer hall which is richly wrought with carved wooden ties and
imposts, stucco bands and medallions, and a bronze-plated wooden door whose original is in the Arab Museum.

In view of the almost complete absence of monuments in Iraq during the 10th and 11th centuries it would be rash to presume what particular ideas the Fatimids imported from that source, but it would appear that the trilobed windows in the drum of the Mausoleum of the Prophet’s aunt Sayyida Atika (c. 1120) at Cairo have migrated from that source. In the neighbouring Mausoleum of Sayyida Ruqayya (1133), whose level is lower than the court and is preceded by a triple arched porch, the trilobed form is combined with the girdling band of the Azhar dome to form the shape of the windows (Plate 61). These windows are raised above the transition zone and are inserted in the octagonal drum. They resemble the curvilinear arch of Saragossa in so far as the arrowhead and intermediate notch are concerned. The mixtilinear window arch also occurs in the minaret of the Great Mosque of Sfax dating from the late 10th or the 11th century. If the trilobed squinches that accomplish the transition at both Atika and Ruqayya (Plate 62) are of the Yazd-Isfahan family, they have been radically modified in their detailed treatment. Thus the corner hood niches are brought down to the cornice on semicircular plans and not on a pair of blind niches at right angle to each other. Moreover between the two flanking quarter domes and the central superposed niche are spherical triangles, and the aforesaid niche itself is at Cairo a half groin on mock corner pier whereas in Persia it is alternatively a concave squinch or a barrel vault with blind tympanum. Further, in Persia the whole is encompassed by an advancing arch frame, while the trilobe outline is left unfettered in Egypt. Finally, if we add to the form of arches and pendentives at Ruqayya the gored cupola with exterior scallops we have here a building in which Persian and Maghrebian ideas have converged to produce a new and unique synthesis.

The clearest proof that the Fatimids did not hesitate to borrow architectural ideas may be seen in their domestic arrangements and in their city fortifications. The houses of Fustat survive in a very ruinous condition due to the abandonment and deliberate demolition of the city on the eve of a Crusader invasion under Amalric in 1168 (when according to Maqrizi the fire lasted 54 days), though enough remains to show that their plans were based on the Ukhaidar domestic units or bayts. These, as we have already seen, had a porch (tarna) parallel to the court (sahn) entered through an arcade of three arches each leading into a room (oda). The other three sides of the court at Fustat had wall recesses or central ivans. Usually one of these contained a cooling watershute leading by means of a canal to the paved basin in the court, as in the Ziza Palace in Palermo (1166). It is relevant to observe that such a historian as Ibn Duqmaq (iv, 118) was aware that the houses in Egypt were built for summer rather than for winter conditions. Abd al Latif (1204) specifically points out that houses were exposed to the agreeable northerly breezes, and they also had tall ventilators ‘open to every motion of the wind’. He describes meticulously how foundation piles (zarbiyyah) were driven by divers excavating under wheels of sycamore which gradually sank with the weight of the masonry wells above it. Finally, at Fustat the dar or houses already demonstrate the use of double courts for public and private occasions, and tilted off-centred entrances to prevent outsiders looking in.

Then again when General Badr al-Gamali became a virtual dictator of Egypt, he favoured his own Armenian fellow countrymen to rebuild the fortifications of Kahira (1087–92), which had been of brick and had covered a somewhat smaller area. Thanks to the excellent mason-craft of the three brothers from Edessa these works come down to us little the worse for wear. But there is nothing Fatimid or even Egyptian about the three imposing Gates known as Futuh, Zuweila, and Nasr—certainly not the round topped battlements or the semicircular arch openings of doors and windows. The gates consist of deeply projecting salients of square or rounded fronts. (Plate 63) The passageways between them are covered by groined vaults or saucer domes that continue the curve of spherical pendentives (that is to say they are pendentive domes rather than domes on pendentives), while above these are guard chambers. At Bab an-Nasr which has an inscription
frieze naming Mustansir (d. 1087), and containing a Shahi formula describing Ali as the favourite of God, a superb newelled staircase winds up to the upper galleries followed by the racetrack lines of the masonry vault. Here, as on other staircases are materials re-used from ancient Egyptian temples with hieroglyphic inscriptions and carvings of gods. Square towers are welded to the circumference walls at intervals, and through the towers passes the broad wall-walk or chemin de ronde. Below it runs a continuous tunnel vault which permits safe communication from tower to tower. Attached to the external side of the wall is an oblong box-like projection carried on single corbel rolls. (Plate 64) As it is not situated above the entrance the function of this machicolation is apparently sanitary. Columns are interjected in the walls for additional strength and to prevent undermining. The voussoirs of blind flanking arches of the tower salients are upholstered with thinly sliced pads of dressed stone (Plate 65) sometimes called godrons. Such padded arches recall the corrugated vaults of Ukhaider, but they were to enjoy a vogue in Syria thereafter. The horizontal arch over the door has broad voussoirs marked with lightning streaks. Here was the joggled voussoir which had appeared in Egypt as early as the Ptolemaic period, and then wandered in the Roman Empire, come to stay in Egypt once and for all. Relieving lintels were also anticipated in ancient Egypt. None of the classical restraint of the Fatimid gates is impaired by the ornament, and in this respect recalls the work of a contemporary Muslim (originally from Sermin) at Aleppo as attested by one of the earliest known Naskhy inscriptions. I refer to the minaret of the Friday Mosque (1089–90) whose finely incised lobate mouldings lend subdued relief to the oblong stages, while the square masonry shaft terminates in a domed lantern of the most assured design.

The last of the Fatimid rulers were weakening the state by carrying on vendettas against one another, and Cairo would have fallen like a ripe plum into Amalric’s hands. It was then that the puppet Abbasid Caliph intervened and invited the aid of the Ayubid Saladin, who had for some time been deadlocked with the Crusaders in Palestine. Saladin compelled the Christian army to retire from Cairo with their mission unaccomplished, took the reins of government into his own hands, and signed the death warrant of the Fatimid heresy which had flourished in Egypt for a little over 200 years. True to his character he implemented no mass purgation, but instead began a counter-propaganda against the Shiabs by re-educating the clergy in orthodox traditions. With this in view he built several madrasas or state endowed schools of divinity. This led to the combining of mosques with theological colleges in Cairo hereafter, and often to the inclusion of the tomb of the founder, since the institution was a charitable one and endowments were made for pupils and teachers.

The institution of the madrasa may have spread with such rapidity in order to restore the orthodox beliefs, but it need not have originated for the purpose. The earliest definitely known class arranged for a teacher was at Nishapur in Khorassan in 947. Soon after, in 951, a college was erected at Bast, and here the pupils received stipends. Citizens of Nishapur next built a madrasa for a teacher who died in 1015, and for another who died in 1027. Meanwhile, at Cairo in 988, 35 salaried lawyers were appointed by the Fatimid wazir to teach at the Azhar Mosque which had been completed earlier in 972. Madrasas, as separate entities from mosques, were founded at Cairo in 1004–5 and in 1009–10. Baghdad appears to have had its first madrasa in 1025–6. But it was only when the Seljuk Prime Minister Nizam ul Mulk founded the famous Nizamiya at Baghdad in 1065–7 for the celebrated jurist al-Shirazi that the madrasa as an institution came of age. The edifice, designed and planned by Abu Sayyid according to at-Turtushi (1122), comprised classrooms, residence and library, with bazaars and caravanserais forming its endowments. Staff and pupils had free board. Teachers had to have an official diploma, and the pupils could obtain a certificate conferring a rank of Doctor of Law and Tradition which enabled them to pursue the career of preacher (khâtib), leader of daily prayers (imám), judge (qâdi), professor (müdâris), and for the chosen few the leadership of the Ulema (müfti, or sheikh ul-Islam). Starting with the teaching of the Shafite school of cannon law, the Nizamiya
soon taught scholastic theology of the Ashari system, and it would seem even gave courses in public administration, perhaps under the influence of its founder who had written a manual for rulers. By the time the MUSTANSIRiya in Baghdad, founded in 1234 and which still survives, took over the leadership from its predecessor, it had expanded its curriculum by the additions of medicine, and such subjects in the liberal arts as mathematics, literature, and history. After this madrasas were erected at a tremendous spate; to cite only one example while there were only 6 of them in Aleppo in 1155, there were as many as 44 by the year 1260. This background must be borne in mind when recalling the promotion of madrasas by the Ayyubids.

Saladin, who was of Kurdish origin, born in Takrit in Mesopotamia in 1138 and brought up in Bosra and Damascus, was sent to Egypt on an expedition by Nuraddin in a secondary command. In 1169 he was invested with supreme military authority, brought an end to Fatimid rule in 1171, and was proclaimed Sultan in 1174. It was the flagrant massacre of Muslim pilgrims that incensed him against the Crusaders, and made him vow to dedicate himself to their expulsion from Palestine. After him the Ayyubid rulers of Egypt continued to have an interest in their possessions in Syria, and consequently in any history of the period the two lands must be regarded as bound by ties in every conceivable sense. Besides building a hospital and a dyke across the Nile, Saladin began the fortifications of the Citadel of Cairo which he extended to meet the Fatimid walls and to circumvallate all the isolated suburbs of the straggling city, which had been left defenceless after the deliberate Fustat fire of 1168. From this time on Cairo became the most outstanding medieval metropolis of Islam. The Citadel itself became the headquarters of Egyptian rulers for several centuries. In 1625 an Elizabethan traveller wrote in Purchas’ Pilgrimages: ‘This castle is environed with high and impregnable walls, and conteyneth such stately and beautiful palaces that can hardly be described.’

The most conspicuous change in Saladin’s military style as compared with the imported style of his predecessors was the use of projecting half round towers. These were usually of 20-foot width and had loopholes, one for forward and two for flanking fire, which were reached by cruciform vaulted passages. The Citadel was begun in 1176, continued for seven years until Saladin had to leave Egypt permanently for resuming his conquest of Palestine, and was not really concluded until 1207 under his successors. The site chosen for it was a spur of the Mokattam hills out of effective firing range from the higher ground beyond. Apart from being a customary practice in Syria one ostensible reason for building the Citadel was as a protection against internal religious insurrection, particularly as the Fatimids had rebelled elsewhere in Egypt on more than one occasion. In the northern enclosure of the Citadel which best preserves the work of Saladin is to be found an inscription in Naskhy characters (one of the first instances of this type of lettering in Egypt) recording its construction by Saladin’s Wazir Qaraqush in 1183–4. Two of the angle towers standing at strategic point were greatly strengthened by al-Adil, the Burg ar-Ramlia and the Burg al-Haddad, and of these, the latter became by its outer reinforcements as much as 22 metres in diameter and stood 21 metres high, acquiring at the same time three machicolations. Al-Adil also built three prodigious square towers of rusticated masonry on the south side. Of these the Burg Saffa is 25 metres a side, the Burg at-Turfa as much as 30 metres (both with a very squat appearance), while the Burg Kerkyalan with its five machicolations is three storeys in height.

Ibn Jubayr was in Cairo in 1183, and tells us that Saladin enlisted Crusading prisoners of war to work on his fortifications. He says that ‘the forced labourers on this construction, and those executing all the skilled services and vast preparations such as sawing the marble, cutting the huge stones, and digging the fosse that girdles the walls noted above, a fosse hollowed out with pickaxes from the rock to be a wonder amongst wonders of which traces may remain—were the foreign Rumi prisoners whose numbers were beyond computation. There was no cause for any but them to labour on this construction.’ This last statement cannot be altogether correct since local architectural features in the towers are frequently
apparent, but this does not invalidate the general truth of this important eye-witness account. In fact we again learn from a different source that later in 1241 another Ayyubid ruler as-Salih built the fortress on the Island of Roda with the labour of prisoners of war captured in Syria.45 Abd al-Latif (1207) refers to Saladin demolishing a number of little pyramids at Giza for constructing the Citadel of Cairo.46

The fine masonry of the Burg az-Zafar in Saladin’s city fortification produces an aspect of rock-line durability. The Tower of Victory in the north-east angle is circular on the exterior and octagonal in the interior, and has extremely thick walls penetrated by an entrance, and seven deep arched recesses ending in arrowslits. The chamber is covered by a dome whose extrados does not appear on the outside as it is encased in masonry, the load being lightened by means of three vaulted passages of diminishing size circumscribing the haunches of the dome in an ascending series, the lowest of them really being a gallery for archers providing a second range of fire. A decorative note is struck by a tunnel vault over a staircase to the right side of the tower which has a network of sunk circular coffers each enclosed in 8-pointed stars. The astute planning of the so-called new Gate also commands admiration. A storming party would have to traverse the moat over a bridge onto a stepping stone isle, and then over a drawbridge onto a deathtrap platform which was exposed to fire from three sides. Before gaining entry they would have to break their momentum and wheel to the right, and dash through a shower of burning naphtha dropped through slots above the entrance, break in a stout door as well as an emergency portcullis with the shortest possible battering ram because of the constriction of space, negotiate a left angle turn in the dark cavern of the gateway, break through another door, and then face an avalanche of arrows from point blank range! Alas, the low site on which these fortifications were built led to their early abandonment and conversion into a dumping ground.47

Meanwhile Nuraddin was himself rebuilding the Citadel of Aleppo (1170), which had the misfortune of being thrice destroyed by earthquakes in the 12th century and twice by invasion in the 13th. Situated as it is 90 feet above the city it presents an aspect both majestic and bold. (PLATE 66) It is approached from the bazaar through a round-edged barbican of excellently dressed stone that leads onto a steeply inclined ramp on high piers. This bridge crosses the 80-foot width of the moat with stone-faced glacis,48 and drives into the jaws of the great vaulted and machicolated salient. Here the passage twists to the right, then left, then left again, then twice to the right, and one last turn to the left, and after a brief stretch under a vaulted roof, emerges onto the man-made tableland with its irreparably devastated ruins.49 In the meantime it has passed several entrances with doors of rivetted iron plates—among them the Gate of the Intertwining Serpents, the heraldic Affronted Lions, and the Laughing and Weeping Lions—not to mention the laterally recessed magazines and guard rooms, overhead slots and cutaway loopholes, and a chilling mantle of gloom. Much of this, together with the stone revetment in the glacis of the moat and the bridge across it, as Ibn ash-Shihna says, may be attributed to the work of Malik az-Zahir and dates back from 1203 to 1214,50 though it is known that one of the inner gates was repaired by Qalaun later in the same century, with walls and crenellations restored by Barqq in 1348, while the barbican leading onto the bridge was restored by the Mamluk al-Ghuri in 1507. This last ruler was also responsible for the advance tower that juts out of the glacis in the southern side of the moat. We say nothing of the grand hall which was once a throne room of domed bays above the main gatehouse, for it is attributed to yet another Mamluk, Qaitbey, in 1472. In order to convey a true idea of how well fitted this Citadel of conglomerate hands was for withstanding long sieges we would have to visit in succession the deep wells, the capacious reservoirs, the subterranean canals, the vast storage chambers, the cavernous dungeons, and the underground passages leading to the town.31

Al-Adil’s Defences of Damascus (1208–17) are less strikingly situated, but are nonetheless massive for that, and in this last respect they resemble his cyclopean bastions at Bosra52 (1203–18) built in and around a Roman theatre of the time of Trajan.
Wherever it was possible Ayyubid citadels took advantage of the terrain, and it has been observed that those of Cairo and Guindi were situated on rocky eminences, those of Homs and Aleppo on the stratified tells of ancient cities, while Shaizar is on a narrow ridge, and Baalbek against an ancient temple. At Damascus the thirteen square and rectangular towers of rusticated masonry with dressed border (an ancient technique of Oriental origin) are some of them 90 feet wide and project as much as 30 to 50 feet from the galleried walls. Pointed barrel vaults are employed for roofing the stages of the towers, with groined vaults at the intersections. The dead corners of the towers are guarded by box machicolations on double or treble corbel rolls. The embrasures are narrow, but there are more than sufficient loopholes in the crenellated parapet to provide a wide range of fire. True there were no plunges for downward shooting, but the curtain has a continuous series of arrowslits at ground level which is served by a narrow vaulted corridor. Two examples of bent entrances occur.

In one of the City gates, the Bab Jairan at Damascus, Ibn Jubayr saw in 1186 an interesting clepsydra or mechanical clock made in the reign of Nuraddin Zangi (1146–73). Twelve little arched windows of brass above the great arch closed successively at the turn of each hour. This was announced during the day by brass balls falling out of a falcon’s mouth and resounding in a cup (these then dropped through a hole and ran back into the gallery), and at night by automatically controlled disks of light. A similar device is described and illustrated by al-Jazari in his ‘Book of the Knowledge of Ingenious Geometrical Contrivances’, which he compiled for the Ortokid Sultan Muhammad in 1206, though there are added automata consisting of figures of drummers, trumpeteers, and cymbalists who struck up martial music at appointed hours (it would seem in imitation of the actual institution of the tabl Khana), and a disk serving as the dome of the stucture on which the twelve signs of the zodiac slowly revolved. Jazari names his instrument ‘the clock of Archimedes’, and though basically the inspiration derives from the horloge of Gaza described by Procopius (c. 473–535) his immediate debt is believed to be to the brothers Banu Musa, c. 850. Not long after Jazari completed his treatise al-Harawi, writing in 1214, saw a clepsydra of this sort in Constantinople on the tower of the Hippodrome but with the figure of a bird appearing in each window for the duration of the hour—surely a step toward the cuckoo clock.

The Ayyubids survived only seventy odd years, and since their affairs were mainly concerned with Syria, did not introduce any strikingly new changes in the religious or commemorative architecture of Cairo. The Tomb of Imam Shafei (1211, renovated 1480 and 1772) was founded by al-Kamil at the death of his mother, who is commemorated here together with Saladin’s wife Shamsa and his son al-Aziz. It has a dome of wooden construction, most likely of Syrian origin, with an open boat as its finial. (PLATE 67) The latter is, no doubt, intended to symbolize an Ark on which the Saint’s spirit drifts up to God in company with those of the royal family, much as did Hiawatha’s canoe set sail toward a land beyond the horizon. It is notable that, in ancient Egypt, the dead body of the Pharaoh was carried in the royal barge along the River to symbolize his journey to the Next World. Although this dome is coated with a sheath of lead, the inner frame veins the surface with thin lines of latitude and longitude. The ovoidal form of the dome recalls the sugarloaf mud huts of the settled village populations of Syria, where they were evolved in ancient times for their superior stability and efficient heat conduction. The rectangular sides with chamfered corners of the chamber below it are decorated with merlon slabs, scooped sun-ray fans in arched frames, and pierced parapets. The wooden stalactite squinches serving as transitional devices to the dome may date from the first restoration since their triple-tiered form is not yet attested at the date of the erection of the monument.

The Naskhy form of writing having been introduced into Egypt by Saladin, makes a bold appearance in the frieze that runs across the ashlar portal of the mausoleum known as Thaaliba (1216). This rounded Naskhy inscription flows over a light arabesque groundwork. The scalloped mihrab of this mausoleum has five sets of radially arranged stalactites. These ever-augmenting
stalactites throttle the conch and altogether displace it eventually. This phenomenon has not yet taken place in the Mausoleum of the Abbasids c. 1240 where the Kufic appears together with the Naskhy indicating that there is still a lingering nostalgia for the older rigid styles, especially in the writing of Quranic texts. The fine lines of stucco are rendered with exactitude, but without much feeling. More important are the stained glass windows with scrolling arabesques framed by stucco, for they are some of the earliest surviving in Egypt.

The minarets of the Ayyubid period are not very happy conceptions. For example in the minaret of the Madrasa of Malik Salih (1243), the square shaft changes abruptly into an octagon, this being masked by a wooden balcony platform. (PLATE 68.) Above the latter a collection of alveoli alternating with mixtilinear voids muddle through and end by carrying a keel-shaped melon cap. Below the minaret is an ornate entrance with the usual decorative elements—a joggled lintel topped by a relieving arch, surmounting a blind stalactite arch. This in turn is flanked by rectangular stalactite panels, and there is a binding inscriptional frieze and so on. New elements occur in the adjoining Mausoleum of Malik Salih 1249–50, including the increase of the stalactite squinches from two tiers to three, and the use of marble to apparel the mihrab, both of permanent consequence in Cairene architecture.

Meanwhile, more interesting developments were taking place in Syria where the Seljuks and their governors—the Zengids—had set about reconstituting the decaying State. Variegated inlays of coloured marble may have been introduced by the Ayyubids from Syria, where for example, we know from Nasir-i-Khusrau in 1047 that the Aqsa Mosque was flagged with coloured marble, and the same was the case with the low wall round its maqbara. But if William of Tyre’s description is accurate (Historia rerum, xxxix, 19–20) then in 1167 Amaury’s French ambassadors had already seen a great court paved with multicoloured marble in the Fatimid Palace in Cairo. In 1183 Ibn Jubayr had seen the Hijr or semi-circle north of the Kaaba in Mecca tesselated with small disks of marble of varying size, and chequered with a number of mosaic patterns. Already c. 985 Muqaddasi reported that the Mosque in Amman had a courtyard paved with mosaic, though he does not specify if this was of the cube type or of geometric segments. In Syria there survive some splendid examples of mihrabs lined with marble in geometric designs in alternating colours such as at the Madrasas of Shad Bakht (1193), of Sultaniyah (1223), and of Firdaus (1235), all in Aleppo. The Ayyubids may also have introduced the use of ivory incrustation in mosque furniture from Syria, since it is found in that extremely handsome minbar with doorway and domed canopy at the Aqsa Mosque carved by four named wood carvers from near Aleppo in 1168–9 (and installed in Jerusalem by Saladin in 1187). Shortly afterward in 1171–2 it is known that an incrusted maqbara screen made by Umar was placed round the Tomb of Imam Shafei in Cairo.

Yet another significant innovation occurs at the Madrasa al-Adiliya (1171, 1222) at Damascus. Here almost for the first time a stone is held in true suspension. (FIGURE 30) It is the springing common to the twin trefoils that capacities the entrance void. This pendant enables diminutive niches to spring from its back and cover the double bay over the porch. Similarly at the Madrasa Zinjiria (1198) in Diyarbekir built by the architect Isa Abu Dirham, the joggled vousoirs of an arch alternately project to form pendants shaped so as to compose a polyfoil arch. (FIGURE 31) This fine mastery in stonework is again evident at the ruined Mashhad al-Husain (1195) in Aleppo where the vousoirs of the squinch arc are prolonged in a curve to form the hood of the niche. The resultant
lines give the effect of a rising sun. At Harran an entrance of 1192 added to the Court of the Great Mosque has a festooned arch framing the horseshoe inscribed tympanum which gives it an effulgence, and indeed festoons of this sort were used elsewhere as aureoles to frame sacred figures.67

FIGURE 31
Diyarbekir,
Madrasa
Zanjiriya, arch

Again, steam baths were at a more advanced stage of development in Syria than in Egypt where the earliest ones are difficult to date with certainty. At Damascus the tepid room soon doubles its auxiliary chambers on either side while itself retaining the demiocctagonal plan with corner exedra alcoves. The latter plan derives from the Byzantine frigidarium,68 and it is interesting to note that while in the East it is the cold room in which the bathers assemble before and after for the purpose of relaxing, the room that serves this purpose best in Western baths is the tepidarium on account of the more chilly climate.69 Eastern apodyteriums were so ample that they were sometimes provided with minstrel galleries in mezzanine floors—two of the changing rooms at Damascus Es Sourouyi and Silsile (early 13th century) are disposed in a manner reminiscent of the Audience Hall of Quseir Amra, suggesting that the latter may have served a dual function itself. In such baths at Damascus as al-Afif (c. 1172), Bzouriye (c. 1180), Sitti Adhra (after 1195), Samé (1204), and al-Joze (c. 1210), the rooms are for the most part covered by domes on squinches. These domes are either gored, or have central lanterns, or are perforated with tiny rows of vents arranged in the form of stars. The long steam room is often roofed with an elongated domical vault on mukarnas cells. In the rooms at the much later bath of Az-Zayn (c. 1320) seven different sorts are employed, and on looking up it appears as if one is viewing the work of some extremely skilful jeweller.

The Ayyubid policy of importing large numbers of Turcomans into Cairo resulted eventually in their own undoing. Though these Mamluks came initially as slaves, retainers, or mercenaries, they soon became rich feudal lords through the land they received for their services. They also began to occupy key governmental and military positions. They were noted for their immense daring and utter lack of scruples. Their practice was to conspire together to nominate one of their favourites to be the ruler, and once installed he would have to hold his own against treachery from all quarters, so that eternal vigilance became the price of power. In a system such as this it was inevitable that rulers should be enthroned and deposed in rapid succession. But despite the intrigues and sedition of these years, in the intermittent periods of stability Egypt made progress in the arts.

In this the forceful personality of the prince may have played a positive role, for cruelty and creativity are not always alien qualities. Baibars was the first true-to-type member of that dynasty in the manner in which he rose from the scullery by dint of his own wiles, and in the dastardly way in which he despatched his rivals. Once enthroned Baibars became the savour of Egypt. While the Christian and Muslim worlds were still contesting the Holy Land, a pagan power greater than them both appeared like a hurricane from the north and wrought appalling havoc in its path. It seemed then that the fate of Egypt was sealed. Baibars, however, was well advised in the tactics of the Mongols, for he had once fought under their banner. He applied the scorched earth policy to Syria, and when he had drawn his enemies to the ends of their endurance, inflicted on them a crushing defeat in 1260. He did not stop there however, he made overtures to Bereke Khan, thus sowing the seeds of disunity in the Mongol ranks, and forestalled a possible second invasion by making alliances with Byzantium, Sicily, France, and Spain. His campaigns against the Crusaders resulted in breaking their last hold on the Holy Land. Finally, he added to the prestige of his capital by inviting the now homeless Abbasid Caliphs to settle in Cairo. Baibars was a truly amazing man who combined courage with cunning, and benevolence with bestiality. The emblems
which he had carved on his monuments, e.g. in his Madrasa in Cairo, the Fortresses of Kerak and Qalat al Husn, and the Bridge at Lydda, aptly consisted of confronted lions, or panthers. His building activities included his Zahiriya Madrasa (1262) on the site of the Hall of Tents and Hall of Lotus of the Fatimid Palace, a monument at Ain Jalut to commemorate his victory against the Mongols, and a tower at Rosetta for observing enemy ships. His twin-towered House of Gold (1265) with dome supported on twelve different coloured marble pillars had a hall painted with representations of the emirs and their followers. Similarly Qalau, who destroyed this edifice in 1285, had in his own multi-pillared domed palace painted scenes of the Sultan’s fortresses, castles, citadels with their rivers, plains and mountains.

Maqrizi tells us that Baibars took wood and marble from the Crusaders’ citadel at Jaffa in 1267, and ordered that it be utilised in building the maqasra and minaret of his Mosque in Cairo. Though the Mosque of Baibars (1266–9) is now little more than a hollow shell due to its later use as an arsenal, one important innovation in its plan is evident on examination. The dome before the mihrab which had occupied only one bay up to this time, had here been enlarged to enclose an area equal to nine-bays. This could be the work of refugees from Anatolia, where such a scheme occurs at Mayyafarikin in a mosque whose domed central part dates from 1152. Anatolian influence is further suggested by the looped circumlocuting mouldings on the rear face of the main gateway, and the double chevron bands framing the northeast portal, though this last feature might ultimately have come from Romanesque France where it was common. The cusped festoons surrounding the padded voussoirs of the portal arch in the south-west entrance may be the work of Maghreb refugees who have left further vestiges (round horseshoe arches and multilobed modillions) at Lajin’s restoration (1296) of the Ibn Tulun minaret. More important still the parti-coloured masonry makes its debut in Egypt. It had been used in Baibar’s Palace, the Qasr al-Ablaq (1266–7) in Damascus, built by his architect Ibrahim ibn Ghanaim, where the exterior walls consisted of black and yellow stones. Al-Umari (d. 1349) who mentions this says that the main part of the palace comprised two confronting ivans, and the decoration consisted of marble in floor and wall panelling, as well as gold mosaic. He also tells us of the later Qasr al-Ablaq in the Cairo Citadel (1313) with a similar alternation of colours on the façade, and windows stained with Cypriot glass ‘like necklaces of precious stone.’

The Mausoleum of Qalau (1285) resembles the Dome of the Rock in that it is a centralized rotunda with its dome carried on supports, though it is even closer to the Church of St. George at Ezra in Syria built in AD 515, for in both the arcaded supports form an octagon while the exterior walls are reduced to a square. (Figure 32) Syrian influence is further suggested in the Madrasa of Qalau which opens directly across a covered passage from his mausoleum, for here the prayer iwan is treated as a triple-aisled basilical hall having stilted arcades travelling toward the qibla wall. The entrance portal of the Madrasa of his son an-Nasir Muhammad (1295–1304) is in fact a genuine Gothic work brought bodily as a trophy of victory from the Crusader’s Church in Akka, just as at Lydda Baibars had built a bridge in 1273 out of materials from the Church of St. George. We presume this to have been a policy of reprisal against the Crusaders who had thoroughly altered the Aqsa Mosque and converted the Dome of the Rock for their own use, and in turn Saladin had turned the Church of St. Anne in

![Figure 32 Cairo, Mausoleum and Madrasa of Qalau, plan](https://example.com/figure32.jpg)
Jerusalem into a school, as gathered from an inscription on the façade. The Church of Edessa provided material for building the Mosque in Harran. But, on the other hand, the Emperor Nicephorus in 965 had turned the Mosque of Tarsus into a stable for horses, removed its lamps to his own city, and had burned the pulpit.

In the Mausoleum of Qalaun four piers and four gigantic columns with Corinthian capitals support a stilted arcade on which the (restored) dome is set, and the small discrepancies slurred by transition cells. Long arcaded reveals break up the qibla wall which faces the street, but this façade is reunified by the soft print of an inscription frieze transversing below the range of windows. (Plate 71) The latter are coupled with an oculus between the spandrels and are covered by light geometric grilles. The dim light in the interior results partly from filling the windrows with stained glass set in small scale pierced plaster designs constituting some of the most splendid examples that survive in Muslim art, though much earlier use of stained glass in known through literary sources. Ibn al-Faqih (903) for example, tells us that the Dome of the Rock (691) was glazed with stained glass and we know stained glass also to have been employed at Kharbat al-Minya (c. 712), Khirbat al-Mafjar (724–43), and Qasr al-Hair al Gharbi (727). Later, the houses of Samarr (after 847) had windows covered with large disks of bulging coloured glass, and contemporary Abbasid palaces excavated at Raqqa also had stained glass. In the 10th century stained glass appeared in Tunisia, and in the first half of the 12th century at Marrakesh. Ibn Jubayr (1184) had seen 74 gilt and stained glass windows at the Great Mosque of Damascus. The successful use of polychrome glass in Cairene architecture which began at the end of the Fatimid period in the 12th century led to one experiment which had no later issue. In the Mausoleum of Ahmad ibn Sulaiman ar-Rifai (1291) polygonal glass plaques painted on the underside in green and brown were embedded in the stucco work of the walls instead of the windows.

Equally luxurious at the Mausoleum of Qalaun is the carved stucco over the entrance which is prefaced by a diminutive court. Most effective are the cavetto archivolts of arches. Polychrome marbles veneering the interior walls up to the height of the doors are here for the first time used extensively in Egypt. The cut and fitted geometrical mosaics of marble and mother-of-pearl in the mihrab are closely related to those of post-Saracenic Sicily. But despite the dim light we may state without hesitation that this building contains some of the best polychrome inlays, stained glass windows, stucco carving, and coffered or panelled painted wooden ceilings in all Cairo. The round horseshoe arches in the blind windows of the minaret are further evidence of Moorish activity (Plate 72). Whereas the crisscrossing torus mouldings girdling the uppermost brick stage rebuilt twenty years later in 1303 are possibly the work of the Seljuk Turks. This is possible also of the turban-like terminal of Malik Nasir Muhammad’s minaret (1335) in the Citadel whose shaft is boldly carved with chevrons (Plate 73). It was incidentally a Turkish practice to place the deceased man’s turban on the cenotaph. These graceful bulb finials gave a new impetus to minaret designing. The square green tiles and faience mosaic in the upper portions of the two minarets of this mosque are among the earliest examples of glazed architectural decoration surviving in Islamic Egypt. A number of Persian ceramicists are claimed to have immigrated from Persia to Egypt.

Here we may observe that Maqrizi refers to an architect of Tabriz coming to Cairo in 1330, directing the construction of the Mosque of Qusun, and basing its minarets on that of the Mosque of Ali Shah at Tabriz. In minaret designing there had already been a slight advance in the Mosque-Mausoleum of Salar and Sanger al-Gawli, built in 1304 (where the lantern of the minaret becomes circular instead of octagonal), although the minaret is obnoxiously cramped side by side with two identical domes over the mortuary chambers. The transition between one stage and the next is somewhat less abrupt, but more important than that, the ungainly and hesitant culmination of the Ayyubid minaret is circumvented by the addition of a cylindrical upper stage. Since the latter was punctured with lancets, the metamorphosis into an open colonnetted lantern became only a matter of time. The next problem to be tackled was the
intransigent square section. It was found impossible to cloak the disparity between the square and octagonal stages in the open and against the sky. So the square section was reduced in length until it became no more than a socle-like base reaching to the height of the mosque walls, and at this level it was least embarrassing to make the change. In the minaret of the Mosque of Maridani (1340) built by the architect Ibn al-Suyufi this fact was realized at last, for here the square section slips unobtrusively into an octagon by means of oblique splays (Plate 74). The long gropings of the Mamluk minaret were at an end, and now an inevitability of logic was coupled with a perfection of proportion. In Maridani a second octagonal stage followed the first now imperceptibly diminished in breadth and volume and separated by a bracelet balcony whose sill is gently corbeled out. This is repeated again, and surmounting the third stage a circular pavilion pinnacles into a concave drum supporting a convex bulb. Fleur-de-lies cresting also make their appearance about this time. They were probably derived from the heraldic emblems of the Syrian Atabegs. From Syria too come the grotto (mukarnas) portals, although they did not become a part of the permanent Mamluk repertoire until the second quarter of the 14th century, and then the earliest ones are also the most varied in their treatment. Thus at the Mosque of Amir Almas (1329) the bay above the recessed porch has a horizontal slightly undulating head with three long rows of pendants hanging (as if from a ceiling) between the cluster of cells. At the portals of the Madrasa of Hassan Sadaqa (1315) and Palace of Emir Taz (1352) the encorbellement proceeds with marvellous ingenuity though there are strictly no such stalactites or hanging members at all.

In the Madrasa of Sultan Hassan (1356-63) the gains of the past have been assembled on such a scale that, to some extent at least, sanity of proportion has been overwhelmed by striving for size. Indeed, a bare recital of dimensions cannot conjure up a vision of its really colossal size. And even if we have seen it and been duly impressed, we are left wondering whether art has here been dedicated to the greater glory of God or to the still greater ego of Man.

The dome that once bulged like a hen’s egg high above the body of the tomb, and which was described by Pietro della Valle in 1610, is now alas no more. It was replaced in 1672 by a characterless sandheap dome clasped by limpet buttresses. Not only is the volume of the dome now grossly disproportionate with the rest of the building, but its smooth surface too is quite out of keeping with the well-weathered stone below. The minaret that fell and killed hundreds of school children has been replaced by one fit for a building half the size. The other minaret stanced on a polygonal tower engaged to the southern corner seems dour and stumpy in spite of being the highest in the land (i.e. 285 feet). The streamline verticality of the side elevation shows signs of promise. The recessed oblong windows are protected by a mail of knobbled-jointed wrought iron grilling, but a thick cornice hacks across their sky-bound lines. The elevation can only be appreciated from a distance, but this is made impossible by the flagrant discourtesy of the neighbouring mosque of ar-Rifai which runs so close to it as to leave a shadowy canyon between.

The entrance portal is set slightly askew at the extremity of this 490-foot long façade. (Figure 33) It contains a door set in a gigantic arched recess which grows into an apical semidome. No less than a twelve-register grotto of stalactites intervenes between the squarebacked recess and the semidome. An alien touch is evident in the spiral rope mouldings flanking the portal, and slip-knot loop moulding decorating the sides of the porch.

A zig-zag passage leads through the anteroom and into a large open court. In its centre is a canopied fountain having a globular dome rising from a high octagonal drum with sloping eaves, the whole being carried on eight light columns. Each of the sides of the court is bored into by an enormous pointed barrel vault. The principal vault rises nearly 90 feet high and continues about the same depth inside. The cost of the wooden centering alone must have been very considerable, as Arabic historians actually attest. The back wall of this principal vault contains the mihrab, which is gaudy with the patchwork colours of variegated marbles. Here the jigsawed and dovetailed surrounds of the mihrab arch are comparatively
well-behaved, but in later years the joggles began
to claw cruelly with the reds biting into whites.
The intention was to excite the eye with flagellant
movement, though whether this was a deeper
symptom of the nervous excitability of the Arab
temperament or the social unrest of the times I
would not like to conjecture.

Other ornamental features at Sultan Hassan are
more successful, among them the magnificent
stucco frieze with mainly Kufic characters above
the dado in the sanctuary iwan, and the great
mossiplated doors, since removed to the Muayyad
Mosque, with their incised shield medallions,
pricked and embossed and set off against the open
frillerated tracery of the handle. (Plate 75).

The four open-vaulted halls of Sultan Hassan
assume a cross-shape in the plan, but this shape
does not appear on the exterior since madrasas fill
up the angles of the cross. Each of these consists
of four storeys of dwelling cells for students and
teachers around a private court with its own
sanctuary iwan. The late Fatimid domestic plan
already had two open-vaulted halls, with semi-
domed back, fronting each other across a sky-lit
quadrangle as is evident at the Qa'at ad Dardir
(c. 1150) in Cairo. Some domestic houses in the
ruins of Fustat (before 1168) were found to have
three axial ivans with the principal side treated as
triple rooms prefaced by a portico. 98 The first
Cairene madrasa to have four ivans was the
Zahiriya of Baibars (1262), though evidently the
ivans were not intended for the four rites but
simply for four different classes, and the actual
dedication of the ivans to the orthodox legal
schools had to wait until the Madrasa-Mausoleum
of an-Nasir Muhammad (1295–1303). 99 The
example must have come from Baghdad where at
the Mustansiriya Madrasa (1227–34) Ibn Fuati
reports that each of the four schools were
represented and each had a quarter. 100 After recent
restoration here it appears that there were originally
only two ivans with a third iwan serving as
entrance, but as against this we have the statement
of Ibn Batuta c. 1350 that each of the four schools
had a lecture iwan with a small wooden domed
canopy for the teacher. 101 I will deal with the actual
origin of the four iwan plan in a later place.

Initially the madrasas had mausolea attached to
them, but later there was a reversion to the
freestanding domed tombs. Because they were
much less ambitious in their scale and complexity,
they did not have far to go before attaining
perfection. The Tomb of Tankizbougha (1362) for
instance in the Cemetery of the Caliphs has not
only clarity of outline to commend it, but elegance
and repose as well. This Amir had built a canopy
tomb for himself in the Mamluk Cemetery three
years earlier, but had probably been dissatisfied
by the manner in which the octagonal zone of
transition had been corbelled on the exterior in a
collar resembling a circular saw (Plate 76). In his
second attempt, this time on a hexagonal drum,
that idiosyncrasy is left out. The beautifully cut
flutes and pipings of the dome give the lie to
March Phillip's attack on Arab architecture as employing 'the worst masonry used by other than downright savages'. The cubical substructure, the intermediate zone, and the clerestory drum are arched with pointed, round horseshoe and keel-shaped voids successively without in any way marring the unity of the whole. The interior is fluent and unostentatious with its shell-fluted hoods enounced in simple oversailing squinches.

In 1382 the Turcoman Mamluks were displaced by the Circassian slaves, but no great importance can be attached to this fact either historically or architecturally. The background had been prepared, and now Cairene architects were ready to erect their masterpiece. The multi-purpose building begun in the Qarafa Cemetery outside the city walls in 1398 by Farag, son of Barquq, set the challenging problem of combining in one structure a mosque, two mausolea, a monastery (khanqa), two schools and two fountains. The old congregational mosque plan with columned bays was reverted to in place of the vaulted ivans, except that here each of the bays of the two principal sides of the court was covered by a low dome, instead of by a flat roof. Dwelling cells for Sufis, and lecture halls were placed behind these lateral prayer halls, and kuttabs, or elementary schools, with fountains, flanked the entrance façade. Like Hakim's Mosque domes were placed in two of the corners of the sanctuary hall and a pair of minarets on the entrance wall. The colonnade that connects the two domes over-canopying the graves (Plate 77) contains the mihrab. The little dome over the latter breaks up any possible suggestion of duality between its two larger associates. The well-like verticality of these domes is typically Mamluk. Such shapes may have been deliberately evolved to minimize the outward thrust, and consequently to leave the haunches of the dome free and unbuttressed. Here a new precedent is set for expressing the transition zone on the exterior: the shoulders of the chamber block are cut off and profiled with irregular ledges which slope up to the circular drum. The gable areas between them are filled by roundheaded windows 'juggling' three bull's-eye voids. The domes are painted inside with bold polychrome radial designs. (Plate 78) The exterior surface of the dome is channelled into chevrons rising from a base of roller beads. Carved masonry domes henceforth became a permanent feature of the Mamluk style. For instance, in the Mosque-Madrassa of al-Ylgay (1373) the ribs of the dome had already been torsioned; later in the Mausoleum of Barsbay (1432) the surface of the dome was carved in low relief with arabesques and star in-fillings.

On the dome of the Mosque-Mausoleum of Qaitbay (1472–4) in the Mamluk Cemetery, the star-forming geometrical criss-crossings were insinuated with webs of arabesque foliage, leaving smooth and shining octagonal centres at regular intervals (Plate 79). Here again, as in Barkuk, were the exterior stepped gradations of the dome-transition, and the minaret poised, organic to the edifice beside the entrance, counterbalancing the dome. The minaret is impeccable in proportion and exuberant in carving, but coming as it does so long after the Maridani minaret its value lies not in its originality but in its near perfection in every respect. As usual, the dome does not cover the whole building but only the mortuary chamber. The rest of the mosque is not quite cruciform in plan. Two of the ivans have been abbreviated because they have outgrown their needs, and small recessions remain to mark where they might have been. Moreover, the tomb chamber is placed in one of the angles of the stunted cross and projects outside it. The courtyard has also dwindled and is covered over, though pierced with a raised octagonal skylight (malkaf) on squinches. In such a vestige of a court there could have been no place for a fountain. The sabil or water basin is therefore removed to the exterior. It is situated in a little recess guarded by a mesh of knobby bars beside the entrance. Over the entrance is a well-aired chamber with a parapet of the kind of turned lattice work (mashrabiyya) that guards the projecting balconies of Egyptian domestic buildings. Diagrammatically the carvings of jointed beads appear like interconnected atomic cells. This upper chamber of Qaitbay served as a primary school, and the sabil-kuttab combination enjoyed widespread popularity among the Circassian Mamluks. The beehive gloom in Sultan Hassan's entrance portal is here trained and disciplined by a trilobed frame, a feature which had already appeared in Sultan Barkuk's Madrasa (1386).
The exterior wall of Qaitbey is clamped around by parallel bands of alternate distempering, but we have already encountered the abilaq masonry earlier. The long-linked chain-mouldings imprisoning the major forms, though appearing much earlier in a related form but with loops, are distinguishing characteristics of the buildings of this manumitted slave, and it may be significant that the Turkish word kayit means restricting or binding. It is noteworthy that this ruler originally hailed from the Volga region. His fine Castle built on the foundations of the Pharos lighthouse in Alexandria still exists. Despite his prolific activity it was the age and not the man that merited praise for the consummate quality of the arts. At Muayyad’s Mosque (1415–20) the antechamber vault of multiple groins branded at the zenith by a recessed spike-end cross and flanked by mukarnas half-domes from which the pendants hang, the timber ceiling of the sanctuary painted resplendently in the miniaturist’s manner, and lastly the coloured veneers of the mihrab wall juggled into interpenetrations and repeats—all these were hallmarks of expert craftsmen who had mastered their materials, and had drawn to the fullest limits the traditional forms and media.

Now that the Mamluk style was fully matured, it is difficult to predict where it would have gone next had it been free to continue its development. In 1517, however, Egypt succumbed to the Ottoman Turks, and the importance of Cairo rapidly waned. Turkish architects were imported to build for the Turkish governors in their Imperial manner with the minor collaboration of local craftsmen. The result was sometimes quite incongruous. In the Mosque of Sulaiman Pasha (1529) in the Citadel, for instance, there is an almost comical contrast between the severe, erect marble panellings of the dado, and the chuckling profusion of the all-over painted flora above. The minaret is of the Ottoman type, there is a forecourt, and the sanctuary consists of three half-domes attached to a domed cube as at the Mihrimah Mosque at Scutari (1547). In the Mosque of Sinan Pasha (1571) at Bulaq the honours are divided evenly. The decorative features of the exterior are Cairene, as also the trefoil squinch (which resembles that at the Qubba of the Fedawiya, (1479), while the flattened dome, the multiple buttressed clerestory drum, (Plate 81) and the somewhat stocky pencilled minar are of the Stambouli type. The dome chamber is surrounded on three sides by arcaded porticoes. Finally, the Mosque of Malika Safia (1610) the wife of Sultan Murad III, is a simplified variant of the Atik Valide Mosque at Scutari (1573). The generous amplitude of the interior has been obtained by raising the dome on a hexagonal columned arcade with spherical triangle pendentives accomplishing the transition to the drum with its gallery and clerestory. The spaces between the hexagonal arcade and the square outer walls are covered by four domes, while a larger dome rises over the projecting mihrab. The loggias in the forecourt covered by domelets are again typically Ottoman, though this elevated courtyard is approached on three sides by high flights of semicircular steps. Square faience tiles were imported from Istanbul in this period, the most extensive series being those brought by Ibrahim Aga in 1652 which revet the interior walls of the Mosque of Aksunkur of 1347–8.

It must not be imagined that the building activity of local craftsmen was altogether ended. There remained some at least who retained their traditional skill and employed it in domestic building. But the architects were not prepared to depart from the already over-ripe conventions, and consequently spasms of colour and ornament had to serve as substitutes for new essays in massing and composition. A veritable pandemonium was unleashed in the Mosque of Burdeini (1616), and much of the available wall surfaces were clogged with coloured mosaic veneers juggled amid insistent white marble, all clamouring for attention.

The process of merely re-assembling old features has not yet ceased today. The Coronation Mosque of ar-Rifai, founded in 1869 and completed between 1905–11 by the Austrian Herz Bey, employs a Mamluk dome and minarets as mere units of a façade. This Mosque

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the 20th century. This is further attested by the Mosque of al-Mursi at Alexandria, completed in 1943, where the planning of the Ministry of Wakfs reveals a modicum of imagination, and the ornamental features are not devoid of interest though the whole is clearly a pastiche.

Finally, a word about the most conspicuous monument of Cairo which dominates the city from its height. It is the Mosque of the Macedonian Mehmed Ali (Plate 82), built by a Greek architect of Istanbul (1830–48) in a foreign style, symbolic of the city’s long years of bondage to alien rule. Anyone who knows the majestic mosques of that city will realize that there has been a falling away in form and decor and that there has been an aesthetic decline.

NOTES

6. Ibn Haukal had previously in 977 reported they were seven or eight storeys high. The most regrettable loss must have been the later Fatimid buildings, for as Muqaddasi says in 985/6 Fustat was the most magnificent city of Islam barring old Baghdad, which was at that time already falling to decay (tr. G.S.A. Ranking, 1987, pp. 14, 34, 36). At the time of the Conquest the buildings at Fustat had only one storey, and it appears that at the time they had objections to high buildings (Baladhuri, p. 349; Tabari, i, 2488; A. R. Guest in *Journal of the Royal Asiatic Society*, 1907, i, p. 81).

There were of course multistoreyed houses in pre-Islamic towns as at Trye and Aradus (Strabo, 753, 757). In Egypt itself many houses were 30 feet high on the Island of Pharos according to Hirtius (E. Breccia, *Alexandria ad Aegyptum*, 1922, p. 106). One suspects a considerate ancestry for skyscrapers in Arabia, since the celebrated Castle of Ghumdan in Sanaa in the Yemen is said to have had 20 storeys (al-Hamdani). The building was erected in 25 bc and reconstructed c. AD 530 (O. Lofgren, in *Encyclopaedia of Islam*, new edn., II, p. 1096).

7. This precedent is held to have led to emulation in the West in the leper houses founded by the order of St. Lazarus (P. Hitti, in *Encyclopaedia of Social Sciences*, ed. E. Seligman and A. Johnson, 1935, iii, p. 442). Harun al Rashid (786–809) had charged a Christian doctor of Judeshapur to create a hospital in Baghdad. Other hospitals erected in Baghdad date from 892–902, 914, 918, 925, and that of Adud ad-Dowlah (892) a truly palatial edifice according to Ibn Jubayr who saw it in 1184. Ibn Tulun’s Hospital was not for soldiers or slaves, but purely for free civilians according to Maqrizi (Khitat, ii, 405. See Ahmad Isa Bey, *Historie des bimaristans (hopitaux) á l’époque islamique*, Cairo, 1928, and D. M. Dunlop in *Encyclopaedia of Islam*, new ed., 1960, i, fasc. 20, pp. 1222–24).

8. There was also a jet playing in a marble basin. (E. K. Corbet, ‘The Life and Works of Ahmad ibn Tulun,’ in *Journal of the Royal Asiatic Society*, 1891, p. 542).


10. According to Maqrizi the fountain was octagonal, there was a veranda on columns around it, and a balcony with balustrade on the roof, the two last features being recorded also about the structure over Zamzam at Mecca—for which see R. A. Jairazbhoy, in *Islamic Review*, Jan.–Feb., 1962, figs. 2a and b.


11a. In 985 the Buyid ruler Samsam al-daulah’s place had a golden sedile (sitting room?) whose door opened on the garden and part of the court. (Miskawaih, tr. Margoliouth, vi, pp. 116–7).
12. The curtain between the king and his guest was already an Achaemenid idea (Heraclides of Cumaë cited by Athenaios Deipnosophistes, iv, 25, 145).
15. Maqrizi, Khitat, ii, 253f.
18. See K. A. C. Creswell, Muslim Architecture in Egypt, i, fig. 44.
23. Tabari, iii, 1407.
25. Qubbah, referring to a tent, occurs in the Old Testament in Numbers xxv, 8.
26. This red leather tent occupying the place of honour in the large tribal settlements was adopted by Muhammad and his rival Musailla (H. Lammens, L’Arabie occidentale avant l’Hégira, 1928, 138).
27. The tomb of Ibrahim Shah at Narnaul built by his grandson Sher Shah (G. Yazdani, in Journal of the Asiatic Society Bengal, August, 1907, ii, no. 8, pp. 584–5).
33. Cf. the practice of rounding the brick work at street corners in 18th century bc at Ur so as to protect passers-by from grazing themselves (L. Woolley, Excavations at Ur, 1954, p. 177).
34. This device to avoid giving an irregular frontage to streets and at the same time to enable the mosque to face the true qibla direction occurs often enough in later Cairene architecture, e.g., in the Mosques of Ganibak (1426–7) and Gauhar Lalla (1430), and in the Madrasa of Abdul Basit (1419–20). (Plans in Wiet and Hautecoeur, Les Mosqués du Caire, ii, Pl. x, figs. 24, 27, 29).
35. If the example in the West minaret of al-Hakim (1003) was not inserted later it is the earliest dated example, for the marble slab at the Mosque of Kairouan is vaguely attributed to the 10th–11th century, and that at the Qala Beni Hammad to the 11th (Farid Shafi, in Bulletin of the Faculty of Arts, Cairo, xv, pt. 1, 1953, pp. 72–6).
37. Cf. the stairs with rampant turning vault in the tower of Alexius Comnenus (1081–1118) at Athos (A. Choisy, L’Art de bâtir chez les Byzantins, 1933, fig. 51, p. 46).
38. The curtain vousoir is claimed to have been introduced into France in the Abbey church at Évron (1150–75) and elsewhere (F. H. Jackson, in Journal of the Society of Arts, lv, 1907, p. 929).
40. Ibid., pp. 189–91.
41. Mosques already had various forms of learning associated with them, and the development of the madrasas did not check but even promoted these activities there (J. Pedersen, in Islamic Culture, iii, 1929, pp. 525–37).
43. Asad Talas, L’Enseignement chez les Arabes, 1939 and A. S. Tritton, Muslim Education in the Middle Ages, 1957, p. 98f.
44. Cf. Jomard, Description de l’Égypte: État moderne, (1809–28), i, pl. 70–2 for Qalaun’s Audience Hall and Mosque of 685 n. For the layout and names of the various buildings of the Mamluk period in the Citadel, see W. Popper, Egypt and Syria under the Circassian Sultans, 1955, pp. 20–23. Some 14th century Amir’s palaces have survived in the city, e.g. that of Khairbek (1294), Yashbak (1335), Bashtak (1337–40), Manjak as-Silahdar (1346–7), and Muhib ad-Din (1353), (see Pauty in M.I.P.A.O., vol. 62, 1932, pp. 42–5).
46. Maqrizi, Suluk, tr. Chlochet in Revue de l’Orient latin, x p. 342. Creswell, cites this and illustrates a
doorway in the Gothic style from the Roda palace of as-Salih, now no longer existing (The Muslim Architecture of Egypt, ii, 1959, p. 84, fig. 39).

46. G. Wiet, L'Égypte de Muradi, 1953, p. 7. Later in 1311 a colossal female statue lying on the Nile bank at Fustat was destroyed and its stones reused in the lintels and bases of columns of the Mosque of Malik Nasir (Maqrizi, Khitat, i, 122f.).


48. Already at Ugarit in the 15th century BC the stone-faced glacis was in use (cf. Syria, xx, p. 289, pls. xlii-xlili).

49. For plan of the Aleppo Gate see Van Berchem and Fatio, Voyage en Syrie, Vol. i. cf. also the complex plans of the Ayyubid gates in the city wall of Aleppo, such as the Gate of Antioch, Gate of Victory, and Gate of Qinnasrin (J. Sauvaget, Alep., 1941, pl. lv, and fig. 34).


51. In the Institution of Cassian (d. AD 435) there is a reference to a secret passage and narrow subterranean gallery (cuniculi) from the citadel to the city (R. Ricard, in Al-Andalus, xiii, 1948, pp. 473–4) but already in Hittite architecture we encounter long tunnels serving as sally-ports (S. Lloyd, Early Anatolia, 1956, p. 134).

52. See A. Abel, 'La Citadelle Eyyubite de Bosra Eski Cham,' in Les Annales Archeologique de Syrie, vi, 1956, pp. 95–138.


54. Their earliest occurrence is the the proto-Phoenician stratum in Ugarit (13th century bc) and in the Phoenician harbour at Tyre. They are then introduced into Israelite buildings in Palestine, e.g. the Solomonic buildings at Megiddo (2nd half of the 10th century bc), venturing west to Greece through Miletus (2nd half of the 6th century bc), and east to Assyria in the 7th century bc, where the marginally drafted blocks are pecked instead of rusticated (G.W. Van Beek, in Archaeological Discoveries in South Arabia ed. R. L. Bowen and W. F. Albright, 1958, pp. 291–3).


57. A. Chapuis and E. Gelis, Le Monde des Automates, 1927, i, p. 62. Jazari had human figures appearing in the windows. A Chinese traveller reported that at Antioch the upper floor of the second gate had a water clock with a human figure and 12 balls (F. Hirth, China and the Roman Orient, 1885, p. 213).

58. The Egyptian belief was in turn paralleled by that of the Sumerians who conceived that the abode of the dead lay beyond the holy river where the last judgement took place (Ancient Near Eastern Texts, ed. J. B. Pritchard, 1955, p. 437). The Greeks too had a myth of a ferry over the river of the Underworld. Coptic grave stele from Terenuthis prove that the soul ship had survived into Christian times. Also a tomb of AD 786 has an epitaph referring to a journey by the deceased to a strange land in a little boat and the difficulty of coming to the other shore (C. Bonner, 'The Ship of the Soul', in Proceedings of the American Philosophical Society, 1941, vol. 85, pp. 84–91).

59. Such domes are represented on a bas relief from Nineveh (705–681 BC as part of the landscape, and may have been villagers’ dwellings. Significantly, the earliest true domes built by the Romans are those over the cold rooms of the baths at Pompeii (late second or early first century BC). Like the former they are of steep elliptical form with an oculus at the apex (cf. Layard, Monument of Nineveh, Series ii, p. 3, fig. 17, with Rivoira, Roman Architecture, pp. 36–8). See now P. Gilbert, 'Origines orientales de la coupole campanienne et romaine', in Annaire de l'Institut de Philogie et d'histoire orientales (Brussels) xxii, 1952, pp. 157–66.

60. The Travels of Ibn Jubayr, tr. R.J.C. Broadhurst, p. 82.


63. L. A. Mayer, Islamic Woodworkers, p. 66. A wooden enclosure was also built in the Dome of the Rock in 1196–9.

64. Among the earliest pendants in Islamic architecture are those of the coffered timber Saracen ceiling at the Capella Palatina in Palermo (1143), whereas hanging rosettes in coffers are known in Hellenic times. The canopy over the porch at al-Adilya is related in type to the canopies with median pendants protecting the heads of saints on the portal of Chartres.
65. A. Gabriel, *Voyage Archéologique*, 1940, 11, pl. LXXXIII. Exactly such an arch is found in the entrance of the Spanish Church of San Roman at Cirauqui (cf. *Boletín de la Sociedad Española de Excursiones*, Madrid, 1905, pl. after p. 250).

66. The curving of the voussoirs back to form the concave demi-dome is found already in the caldarium niches at Hammam as-Sarakh (c. 730), and goes back even further to the half dome in the Nymphaeum in Amman (Butler *Princeton Expedition, Southern Syria*, ii, A. 2, Appendix).

67. E.g. a seated Bodhisattva from Mathura (H. Ingholt and I. Lyons, *Gandharan Art in Pakistan*, 1957, pl. xi, 2).


76. Ibid., pp. 669–70.


80. Boase, in *Journal of the Warburg Institute*, 1, 1938–9, p. 3.


83. Transparent, colourless window glass was used at Pompeii. Stained glass is known to have been used in the arched windows of the Basilica of St. Paulouside-the-walls at Rome, the early 5th century Church of Gallad Pacidia at Ravena, and at a church in Lyons c. 450 though it is doubtful if the glass in the windows of the apse of Sta. Sophia was coloured (H. Leclercq, *Manuel d’Archéologie Chrétienne*, ii, 1907, pp. 650–1).

84. Le Strange, in *Palestine Exploration Funds Quarterly Statement*, 1887, p. 95.


97. Magrisi, ii, p. 316; Ibn Iyas, i, p. 204.

98. A.B. Bey and A. Gabriel, *Fouilles d’al-Foustat*, 1921, p. 77, fig. 31, types v, vi.


102. Cf. the design of the wooden screen decorated with bronze studs excavated at the Phrygian site of Gordian in Anatolia (R. S. Young, in *American Journal of Archaeology*, vol. 64, no. 3, 1960, p. 230, pl. 56, fig. 5).

103. E.g. at the Samanid Tomb at Bokhara, and subsequently at the Karatay Madrasa, Konia (1251).


105. As it has been observed, this is a sort of fan vaulting with the surface ridged and furrowed instead of the moulded ribs of late Gothic. In the 15th century it is found in Cairo, Jerusalem and Damascus (one dated example being the turret chamber Madhanat al-Ghubriya or the Western Minaret at the Greel Mosque of Damascus built
by Qait Bey in 1483), and always there are the inverted quarter conesoids springing from the corners and supporting a recessed slab or small saucer dome in the centre of the ceiling (W. Harvey, 'Saracenic vaultings', in The Architectural Review, Nov. 1911, pp. 241–5).

106. E.g. cf. the House of Qaitbey (1485) with the House Manaoui (1755). (E. Pauty, Les palais et less maisons d'époque Musulmane au Caire, 1933; Pls. xxvi-xxviii.)

107. As also the Throne Halls of the Ras al-Tin Palace in Alexandria, founded in 1834 by Mehmed Ali and completed in 1845, and of the Abdin Palace in Cairo, 1863-74, founded by Khedive Ismail. The remaining portions of the Palace were erected by French and Italian architects (Mahmoud el Gawhary, Ex-Royal Palaces in Egypt, from Mohamed Aly et Farouk, Cairo, 1954).
For centuries the Arabian Caliphs had hammered at the strongholds of Byzantium without measurable success. In the end it was the hardy Seljuk nomads from the Kirgis steppes in Turkestan who obtained the first secure foothold in the heart of Asia Minor. Tughril Beg, the grandson of the founder Seljuk of the Ghuzz tribe, was recognized Sultan at Baghdad in 1055, and it was his son Alp Arslan who defeated the Byzantines at Manzikert in 1071, thus opening up Armenia and Anatolia to Muslim colonists. The Seljuks had already subdued the various factions and consolidated the Muslim East under their banner. Their Empire, administered from their capital at Isfahan was, however, too far flung for efficient control of distant possessions, so it became necessary to subdivide the provinces among leading members of their family. Anatolia was given over to the rule of Suleiman Kutulmush (1071–86) who established an independent capital at Nicaea from about 1077, though the city was lost to the Seljuks in the First Crusade in 1097, and Konia (conquered 1069) next became the permanent capital. For a considerable time the Seljuks were kept busy vying for tribal ascendancy, and staving off Byzantine encroachment or marauding Crusaders en route to the Holy Land. But the tremendous boost of building activity in the following century is explained mainly by the fact that a certain measure of unity, prosperity, and security had been reached.

I do not imply that the Anatolians severed all relations with their compatriots in Iran, Mesopotamia, and Syria. On the contrary the oldest surviving building in their capital at Konia is known to have had as its architect a master builder from Damascus, while the pulpit dated 1155 was made by Makki a craftsman from Akhlat for Sultan Masud I (1116–56). The obvious Damascene features about this Mosque of Allaedin (1221) are the disposition of the aisles parallel to the qibla wall, and a domed transept. But this basic plan already occurs at the Great Mosque of Diyarbekir built by Malik Shah in 1091,1 and it must be remembered that it was this same Malik Shah who had rebuilt the dome of the Great Mosque of Damascus which was described by Ibn Jubayr in 1184. In other words it is not unlikely that both at Diyarbekir and at Konia the mosques are emulating the Damascus plan, which had been used by the Omayyads elsewhere as at the Mosque of Bosra (720), and of Qasr al-Hair al-Sharqi (728). At the Konia Mosque which rises on a mound (where the remains of an elaborately bracketed tiled kiosk of the Seljuk palace still stands on a tower), the name of Muhammad bin Havlan of Damascus occurs carved on the buttressed entrance façade which is of golden brown squared limestone blocks (Plate 83). This wall is pierced with a register of high semicircular arched windows flanked by colonettes, which again flank the blocked up entrance arch. In the tympanum above the joggled lintel of this arch is an inscription assigning the completion of the work to Allaedin Kaikobad I in 1220–21. Ibn Bibi states that he was skilled in ‘architecture, carpentry, sculpture, saddlery and painting’.11 He is named again in the inscription in a star panel carved on the left extremity of the façade, while the name of his elder brother Izzuddin Kaikaus, entitled ‘the Sultan of the two seas’, with the date 1219–20 occurs nearby in a blind window niche with zigzagged archivolt and framing arch rising from volutes. The portal arch itself is stressed by being enclosed in a pattern of interlacing cusps and rectilinear framing (Plate 84). This interplay of looped moulding, which is also found in contemporary Aleppo, is flatly executed with marble inlays in alternating white and grey, as if the artist was attempting to transfer a pavement idea to a wall. Again some of the column shafts in the interior are twisted at a point into link knots—a not very happy expedient which was henceforth discontinued. It is possible that these convolutions were copied from Christian
manuscript illuminations\(^2\) (we know, for example, that vast quantities of illuminated gospels had been seized from the Georgians by the Shaddadids of Ani in 1163),\(^3\) but if so this must have been accomplished also in Italian Romanesque churches where such examples of knotted columns are found. The second original feature here is the polyhedral pendentive serving as a transition to the dome over the mihrab—an advanced version of the single glacis invented in Northern Syria. This glacis is a flat (as against a spherical) triangle with its apex pointing down. Muslims had up to this time regarded the spherical triangle pendentive as too obvious a solution and one whose aesthetic possibilities were definitely limited. The glacis on the other hand was capable of a certain amount of elaboration. Since the single glacis of the Tetrapylon of Laodicea (Latakia)\(^4\) probably of the 4th century AD only succeeded in converting a square chamber into an octagon, the Seljuks struck upon the idea of faceting the plane into several adjacent triangles each of which added one side to the rim of the transition zone, and resulted, in this case, in producing a twenty-sided figure. In this way when the circular base of the dome settled over it there were no untidy edges left over. The evolution of this type begins at Aleppo in Nuraddin’s Maqam Ibrahim (1168), and the Madrasa Shad-Bakht (1193) built by the architect Qasim, son of Said, where the glacis becomes double.\(^5\) However, the most spectacular example of the polyhedral pendentive is to be seen in the Karatai Madrasa (1252) at Konia. Its plan reveals a court domed and penetrated by a lantern, and leading into a vaulted iwan which is flanked by a pair of small dome chambers, while cells for students flank the covered court. In the central dome triangles fork out into varying angles at the four corners, and the dome settles over the polygonal drum that is formed. (PLATE 85) A girdling inscription frieze mediates with its inscrutably contorted letters. The cupola of complete polychrome faience mosaic is decorated with rayed medallions that seem to have been spun with the swiftest spindles. Once order has been wrought out of chaos each pattern bursts into a catherine wheel. A similar type of polyhedral pendentive occurs at the Indje Minare Madrasa (the College of the slender minaret) erected by the architect Kelul ibn Abdallah in 1251, though instead of being covered with coloured tiles the bare bricks with recessed pointing form long striations which are appealing in their own way to the less fastidious eye. Seljuk tile revetment was on the whole reserved for interiors where it proved most effective in two tones of blue, white, and black, as is evident on the mihrab and extraordinarily attractive mortuary chamber of the Sahib Ata Madrasa at Konia, also built by the same Kelul for that prolific patron of building, Prime Minister Fakhradin in 1259. This building is really a mosque-cum-turbe-cum-madrasa with a fountain in the entrance (beside which a slab with Roman figure sculptures has been embedded). Glazed bricks had been employed for borders and inscriptions in Seljuk Iran at an earlier date (i.e. after 1058) than in the buildings of Seljuk Turkey, though polychrome tile for covering large surfaces was at a more advanced stage in the latter during the 13th century judging from existing remains. In the passage westward the blue glaze raised geometrical strip interlace above the portal of the Gunbad-i-Surkh at Maragha (1147) serves as an important link.\(^6\) The Turbe of Izzuddin Kaikaus (1220) at his Hospital in Sivas has on its entrance façade both blue glazed and red unglazed strip interlacing raised in relief against a cement background, and the work is signed by the Persian Ahmad son of Bakr of Marand (PLATE 86). Thereafter the interstices are filled with cut faience, but this stage takes place in Anatolia,\(^7\) perhaps suggested by the early practice of painting backgrounds blue. The body material of Turkish Seljuk tiles is at any rate the same as used in contemporary and earlier pottery, that is, white ground quartz. The technique in assembling the mosaics would be first to prepare a cartoon of the design, then to place sawn pieces of glazed and fired tiles on this face downward, and next to make this a solid mass by pouring liquid plaster over the back, which would settle along the bevelled pieces. Cross-canals could also be embedded in this plaster both for strengthening it and for facilitating its use as a panel ready for setting up against a wall.

The nomadic element makes itself felt in Seljuk architecture in the eight-sided tent roofs
converging to a point on their exterior and expressed as canopied domes on their interior. As a cross-section of the Doner Gunbad (c. 1275) at Kayseri shows, the masonry dome serves as a plinth support for the cone that rises above it (PLATE 87). The square masonry basement that contained the embalmed corpse probably of Shah Jehan Khatun is converted to a twelve-sided chamber (presumably a masjid for prayers to the deceased) by means of corner splays, and the cone in turn obtains a footing on a corbelled cornice which has attained a spherical plan. Sultan Saltuk’s turbe (funerary edifice) at Erzerum (c. 1170) may be one of the earliest of this type in Anatolia (PLATE 88). It is markedly Byzantine in spirit with its horizontally coursed particoloured walls, emphatically moulded semicircular arches, cushion capitals with median projections, and octagonal walls each shaped on the top as a gable. Later at Divrik (1228) the drum was omitted, and the sloping sides of the cone rose directly from the continuous zigzag of the gables (PLATE 89). Elsewhere as at the Chifte Minare at Erzerum (1253) the circular base of the cone rose without complication from a cylindrical subchamber, whereas in yet other instances as at the so-called Guduk-Minare at Sivas (1347), Tomb of Shaikh Hassan Beg son of Sultan Eretna, the square chamber revetted outside with marble, was converted on the exterior by means of triangular glaciis to a circular base, and on this the cylinder and cone reposed in turn (PLATE 90). This is the case also in the faience-clad Turbe of the famous poet Jalaluddin Rumi at Konia designed by Badradin Tabrizi in 1273–4, though the whole has been conceived as a bundle of reeds lobate in section which diminish to a point (PLATE 91). The prototype of this lobate exterior of drum and tent dome occurs at the Saltukid princess Mama Hatun’s Gumbad at Tercan (1192), which is contained in an enclosure bounded by a circular wall. The architect of this building was Mufaddal the Cross-eyed from Akhlat.

Seljuk sculptors devoted considerable attention to entrance portals. One fine example is at the madrasa of Haji Kilij at Kayseri (1249). The portal frame begins with a colonnette, and works its way outward with a plat band, a chamfered angle followed by a low relief interlace brocade, and a fillet border terminated by an engaged angle shaft. The portal of the Mosque of Allaedin at Nigde (1223), with its immaculate 3:2 proportion, has a series of overlapping frames with their inner edges notched in turn by half-stars, segment frills, and acute angle repeats, which impart to it a bejewelled effect. The entrance frontispiece of the Sirtcheli Madrasa in Konia (1234) (where the name of Muhammad grandson of Osman from Tus in Persia indicates that he executed the faience mosaic tiles covering the walls of the iwan) again combines these jewelled devices with delightful results (PLATE 92). A door with a segmental head is set deep into the face of the portal, its vousoires reticently joggled. The portal arch verges on an oval form, and is garlanded with a series of punched-out miniature trefoils. In the spandrels of the arch are shell medallions. The engaged angle-shaft of the portal is boldly channelled with vertical layers of chevrons. Chevron shafts had already appeared in Allaedin’s Mosque in Konia, 1220–21, and the Sahibye Madrasa in Kayseri in 1238. The façade of the latter is terminated with round towers of masonry with drafted margins.

As early as 1228 a second style of carving had suddenly made its debut in the Mosque-Hospital of the Mengushid ruler Ahmad Shah at Divrik. The East portal of the building is apparelled in the same shimmering network as the others we have described, but the main portal on the North is littered with lumpy and ill-assorted oddments rendered in a novel style. At first glance these appear like fluttering wing-moths and flapping lily pads. On closer inspection, however, they turn out to be giant scale leaves, some with the outlines of halberd blades. Each acts as a separate entity, and is raised several inches out of the fine-grained ashlar. The chiselling is so deep in fact that the pierced flora gives the illusion of floating without support and seems to belong more properly to stucco forms. The coffered octagons along the jambs seem to be ceiling ideas transferred to the wall. In the recess of the entrance arch are padded parallelograms arranged in enigmatic patterns. Engaged colonnettes have corbelled capitals which convert their superstructures into starshaped plans. The monolithic effect of the portal-head, the lotus
blossoms carved in profile, and the multiple horizontal mouldings constituting plinths on which the West portal stands (Plate 93), serve to subscribe a somewhat Hindu character. It would seem almost as if craftsmen from the four corners of the Empire had been employed on this structure and each assigned a separate gate. All we know is that the architect was an Armenian named Khurramshah from Akhat, and the carver of the ebony pulpit of 1240 Ahmad ibn Ibrahim, a native of Tiflis. As for the West, it too is seemingly represented, and the portal of the Hospital may well be in part the work of Crusading prisoners of war,\textsuperscript{12} probably the so-called Hospitalers who formed a separate body from the Knights Templars (Plate 94). They have left their impress on the fine verticality of the door jamb, and on the idea of the centre shaft that carries the tympanum in the manner of the trumeaux of such French Romanesque Churches as St. Trophime, Arles (1150). But the column at the Divrik hospital with ragged carvings projecting at the base may be
talismanic in intention, for it was not an uncommon practice for fever patients to tie rags to columns in the hope of effecting cures.\textsuperscript{13} The rest of the Divrik mosque is not lacking in interest. The second bay of its nave is vaulted with heavy ribs forming a four-pointed star; the third bay is covered by a domical lantern on polyhedral pendentives (\textit{figure 34}). The dome of the fifth bay which is over the mihrab is expressed on the exterior as a high-peaked cap, while the cupola on its reverse side is gored with ribs of square section, and supported by colonnettes on consoles in the drum which rises on squinches.

Marble veneering of the ashlar portal as it is encountered in Konia must originate in Aleppo, where it is to be encountered at the Jami Al-Firdaus (1235) and elsewhere.\textsuperscript{14} In the Karatai and Allaedin's Mosque at Konia it consists of intersecting multifoils which follow the archivolt, and are looped into circles at the apex. The lines are then laterally extended in a puzzling fashion. There is no evidence of relationship with the knots of Assyrian black magic which were intended to harm the enemy,\textsuperscript{15} but there can be little doubt that the Trees of Life and animal forms carved on Seljuk portals, such as dragons, lions, harpies, and double-headed eagles, are more prophylactic in intention than heraldic. This is especially suggested by the earliest of the series which is the pair of hounds on leash carved on the excavated Numairid gate of the citadel of Harran (1059).\textsuperscript{16} In fact Ibn al-Faqih (903) testifies that the pair of lions flanking the steps leading up to an underground water tank at Darband were considered as talismans.\textsuperscript{17} A 10th-11th century caravanserai at Beleuli in N.W. Khwarizm has a pair of lions in the spandrels of the entrance.\textsuperscript{18} Another conclusive literary testimony is that of al-Harawi (d. 1215), and this was actually in Anatolia. He says that in Mayyafaraiqin there was a talisman against dogs and another against serpents, the latter being the representation of a serpent with two heads which was in the Church of Mart Daris.\textsuperscript{19} The idea of the knot at the zenith may be a development of the inverted crescent above the apex of the arch used by the Sassanians, and revived in the mihrab of Alfael (1094) at the Mosque of Ibn Tulun.\textsuperscript{20}

Whatever the origin of the gymnastic type of moulding, it was eminently suitable to the Oriental temperament; like their penchant for bargaining, it made very conceivable excuse to delay arriving at the point. In the Madrasa of Indje Minare (1251) at Konia these circumlocuting mouldings are rendered in heavy torus rolls flanking the portal arch (\textit{plate 95}). As they approach the summit they bend over and terminate in the crook of a shepherd's staff. Between them a sort of key-stone slouches down like a lump of dough.\textsuperscript{21} The influence of Divrik is evident in the flat-headed portal halfdome, and in the sculptured trimmings in soft sandstone that crop up sporadically here and there. The dome that appears on the exterior is penetrated by a (modern) lantern for lighting what is in reality an enclosed court. The sanctuary ivan is flanked by a pair of dome chambers, while dwelling cells are arrayed on two sides of the court, and from the fourth side projects an entrance vestibule (\textit{figure 35}). The now incomplete minaret rises on a square masonry shaft which changes to brick and is soon converted to an octagonal base. The shaft of the first storey that rises above this has alternating segmental and angular sides, separated by reeds and ornamented with diagonally coursed glazed brick ends. The upper two stages were destroyed by lightning in 1899. At the Chifte Minare in Erzerum, a four-ivan madrasa with turbine attached built by Huand Khatun, daughter of Allaedin Kaikobad in 1253, the whole shaft of the two minarets in reeded with torus bundles. In the Gük Madrasa at Sivas (1272) built by the architect Kalyan when round towers flank the extremities of the façade, (\textit{plate 96}) reed-profiled minarets are again inserted with glazed bricks forming patterns. Here, as in Iran and in India, paired minarets are stanced on top of the portal. The Yakutiye Madrasa in Erzerum (1308) not only has glazed brick insets, but the whole cylindrical surface is cut awthwart with projecting diagonally-coursed brick bands forming a rigid mesh (\textit{plate 97}). On the other hand at the Ulu Jami and Guduk Minare in Sivas, the pointing between the bricks is recessed and the bricks are widely spaced, so that each brick seems to hover in free suspension.
The Mongol invasion of 1243 had undoubtedly brought a stream of refugees to Anatolia in its wake. This is suggested by scrambled animal heads carved in relief on the portal next to the door lintel of the Gök Madrasa at Sivas (Plate 98), which has been traced back to a Tang dynasty original. Perhaps also the squirming dragon-tail decorating the portal archivolt of the Sultan Han Mosque (1230–36) was intended to ward off the threat of the Mongols. At the contemporary Susuz Han near Burdur, where such coiled dragon archivolts occur threatening a human head, there are above in the spandrels a pair of protective winged angels. In order to make the meaning clear we may compare the serpent motif in other related Islamic monuments. On the archivolt of a gate in the Citadel of Aleppo (1203–1214) interlooped double-ended serpents are biting themselves on both ends, as though suggesting the self-destruction of evil (Plate 99). We know from Ibn ash-Shihna that at the Gate of the Gardens in a tower called the Tower of the Serpents there was a talisman which was believed to have made the bites of serpents ineffective in Aleppo. On the Talisman Gate at Baghdad (1221–2), before its destruction in March 1917 in World War I, serpentine dragons were held in abeyance by a crowned hero-figure, perhaps representing the Caliph Nasir (whose name was inscribed here) keeping his enemies in check. It is my belief that in this case the dragons symbolize the Crusaders and the Khwarizm Shahs respectively for the following reason. The Crusader's Cross which Saladin had sent to Baghdad in 1189 after the battle of Hattin (1187) was buried by order of Caliph Nasir in the threshold of a gateway, the Bab an-Nubi, so that only a small portion of it projected and this the people trod underfoot as they entered. Later an exception was made, and the ambassador of the Khwarizm Shah was compelled to kiss the threshold of this very gate under protest—therefore, partaking in the subjection and defeat of an already vanquished enemy. It was appropriate, therefore, to picture the Caliph grasping the tongues of monsters that have since time immemorial served as symbols of evil and sometimes specifically of an enemy people. On the 13th century gateway of al-Khan near the Sinjar Mountains the dragon with knotted body is being pierced by a lance held by a figure who may be Khidr, the Oriental counterpart of St. George, and the patron saint of travellers. Finally, an extraordinarily bold use of protective serpents is made on a marble door from the Mausoleum of Imam al-Bahir at Mosul built by order of the Atabeg Lulu (d. 1259) which is now at the museum of the Abbasid Palace in Baghdad. On this door, from what it must be remembered was a saintly shrine, blind niches are framed by six pairs of serpents, two repeatedly twining on the flanks and four above the lintel—ensuring no doubt that with such a multiplicity of fearsome guardians evil influences could have no chance of gaining entry. The idea may be traced back ultimately to pre-Islamic Arabia, where as at the Temple of Attar at Maain the gateway was flanked by a relief with nine vertical columns of interlaced serpents.

Returning to the little masjid in the royal caravanserai or Sultan Han situated on the road between Kayseri and Sivas we observe that it is placed dead in the centre of the forecourt (Figure 36). But in order to avoid the bustle of tired and talkative wayfarers the sanctuary has been
Figure 36 Sultan Han, between Kayseri and Sivas (A. Gabriel)
raised off the ground on a single-storey porch-kiosk which is accessible by stairs corbelled on the exterior. The solution was probably suggested by the Treasuries (bayt-al-mal) in the courtyard of Syrian mosques which consisted of domed drums forming upstairs chambers supported on rings of columns. In some ways the nave of the Grand Hall at Sultan Han is Gothic in feeling. Its pointed barrel vault of masonry strengthened with transverse ribs rises clear above the seven transverse aisles, and is interrupted at the central crossing by a domed lantern rising on spherical triangle pendentives.

Strict chronological sequence has been abandoned in this discussion of Seljuk architecture because regional influences disrupt the steady evolution of forms, and also they were not the only dynasty ruling in Anatolia. Thus the Mosque of Dunaysir (1204) of Ortokid dynasty located at Koch Hissar near the southern frontier falls into a class of its own, and seems to have arrived full-blown to perfection (Figure 37). As the arches of the flank of the main façade approach the centre they rise into an immaculate pishtaq frame which is emphasized by fine mouldings. The door-head of the portal is decorated with bowknot joggles, the enclosing arch with bi-coloured multifoils, and the surrounds with what can best be described as beaded bubbles linked together in an ascending spiral. Although this façade is of masonry, the vaults and domes are of brick. The hood niche of the squinch is filled with ring upon ring of shallow mukarnas cells delicately picked out with facets. The octagonal zone is once more smoothed into the desired shape by glacis triangles, and the ellipsoidal dome once rose high on a drum.
supported by pyramidal buttresses. The Mosque of Dunaysir, bereft of its court and with a sanctuary of the Damascus plan, lies ruined in the desert like a ship stranded on an ocean floor.

A later successor of this style in S. E. Anatolia was the Mosque of Abd al-Latif at Mardin (1371), which also inherited an admirable sense of proportion. But on the whole the 14th century which may be described as the Beylik period, consisting of independent principalities following the extinction of the Seljuks in 1308, was a much less inventive period judging from what survives, though the submerged glass palace in the reservoir at Mardin, mentioned by al-Dimashki (c. 1300) must have been a marvel to behold. If there really was such a building at Mardin it may have been inspired by descriptions of the diving bell in the Alexander Legend, for at Mardin too, according to Dimashki were doors and windows of glass through which fish could be viewed without getting wet. It was not however, simply an aquarium. Dimashki says it was intended for the king on hot summer days, when he would row across to it, and the water would be increased until it submerged the place. Such also must have been the function of the pavilion in the centre of the artificial lake in the Palace of Yahya ibn Isma'il al-Mamun (1043–75) at Toledo. According to al-Maqquiri following Ibn Bassam it was of stained glass incrusted with gold, and it was devised so as to suction the water to the pinnacle of the pavilion and then to let it flow down on all sides. Later, the Mughals built platforms with awnings in the midst of tanks and rowed across to them or crossed on axial bridges, and in one instance the whole structure was submerged and access could only be had by swimming through a tank and entering by a trapdoor.

Returning briefly to the monuments of Mardin we find that the most attractive features are the expression of the mihrab on the exterior in a buttress casing, crowned by a half dome, and funerary dome composed of angular ribs rising on a coronet of niches. Both these features occur in the principal Mosque of Mardin, while the latter also occurs in the Tomb of Sultan Hamza in the same city. The plan of this mausoleum is felicitously expressed on the exterior with tall shadowed reveals. But this type of dome does not displace the steep-pitched tent roofs of the earlier years, for as late as 1477 in the Mausoleum of Bayindir at Akhat built by the architect Baba Jan such a roof recurs. But the sealed cylindrical chamber is replaced curiously enough by an open circular colonnade which makes it reminiscent of a round Roman temple.

By the middle of the 14th century mukarnas cells began to be used as frames for the rectangular portal, for instance in the Bab-as-Sur at Mardin. After this, mukarnas within portal niches had multiplied to such an extent that it was possible to count as many as 21 tiers of cells ranged one above the other, as for example at the Ak Madrasa of the Karaman dynasty at Nigde (1409). Space, however, forbids us describing the architecture of the provincial dynasties, and we must only be content with the observation that the narthex and the cloistered court were features inherited from them by their Osmanli successors. The Aydin-Ogullari, for example, have the narthex in their Ulu Jamı in Birge (1312), and the cloistered court in their Isa Bey Mosque at Ephesus (1375).

Now we must retrace our steps to introduce these Osmanlis. A century and a half after the Seljuks had established themselves in Rum, a large tribe of Turcomans was uprooted from the pastures in Transoxiana by the Mongols, and compelled to flee westward with the enemy close on their heels. Their chieftain Sulaiman led a concourse of fifty thousand families across the whole length of northern Iran until at last they found security on the high Anatolian plateau. Like most refugees they had no hankering to settle in this land for ever, but it so happened that Sulaiman's son Ertogrul rescued Allaadın of Konia from the clutches of the Mongols, and for this he received a large grant of land to the north of the Seljuk capital as reward. It was Osman (1300–26) the son of Ertogrul who laid the foundation of the dynasty that goes by his name. The Ottoman dynasty was to survive for the incredible length of over half a millennium without a break, though often not without questionable means. It was only dissolved in the present century by that great patriot Mustafa Kemal when he inaugurated the popular New Republic in 1923.
Osman’s son Orkhan disturbed the long stalemate with the Byzantines. While the Greek Empire seethed with dissensions, he marched into Brussa and established his capital in that city in 1326. Such easy successes inflamed the Ottomans with a mounting ambition. Their aggressive campaign took them across the Hellespont and onto the European side. Then under the newly organized Janissary corps recruited by converted Christian lads who were disciplined from their childhood until they were veritable automatons, Sultan Murad (1360–89) reduced the Balkan states as far as the eastern reaches of the Danube. Suddenly the Ottomans, that obscure refugee tribe, had rocketed to fame. During his lifetime, Murad increased Ottoman territory by more than five times, a good half of which was now on European soil. Murad’s son Bayazid ‘the Thunderbolt’ (1389–1403) slew the combined host of European soldiery, extended his sway to the Parthenon of Athens, and promised to hitch his horse at St. Peters in Rome.

With my sword I’ve conquered many and many a shore, Still I sigh right sorely: ‘Ah to conquer more.’

(1460)

With the appearance of the dreaded shadow of Timur the Ottomans were threatened with extinction, but Mehmed I (1403–21) the gentleman poet set about consolidating the Empire and repairing the losses. At last approached the hour when Islam could look hopefully across the Bosphorus at the ancient capital of Constantinople, that crossroad linking two continents and two seas. In 1453, the long-anticipated siege was enacted lasting fifty-three tense days in which the land portage of the navy stands out as the most spectacular event. Finally the wall was breached and Mehmed II marched into the city at the head of his troops. The Conqueror set about demonstrating that he could be as liberal in peace as he was crafty in war.

One of his successors, on the other hand, was revoltingly cruel. This Selim ‘the Grim’ discomfited the new Shia dynasty in Iran (1514), brought the Mamluk rule to a close by investing Cairo (1517), pounced on Syria and Arabia, and transferred the Caliphate title to the new Ottoman capital where it remained until it was eventually abolished. Under Sulaiman the Magnificent (who had been reared as the apprentice of the Greek goldsmith Constantine at Trebizond), the Empire of the Ottomans extended from the Danube to the Nile, and from the Atlantic to the Tigris. The naval defeat of Lepanto in 1671 marked the beginning of the long climb down the ladder and the gradual stripping away of foreign possessions. The rise of European power and the corrupt state of affairs in the capital ensured the decline. Judging from the Ottoman contribution to science and philosophy one would not take Nabi Effendi’s boast seriously when he wrote as late as 1694 that ‘he who passes elsewhere for a wise man of the century, is but a blockhead here.’

So much for a fleeting background of Ottoman character and career. Since the early history of these peoples is steeped in military activities, it would be appropriate to say something about their military architecture first. Perhaps, since they enlisted Christians in the armies and employed Christian architects to build some of their first mosques at Constantinople, it is possible that the first Ottoman castles were built under the expert guidance of Byzantine captives. At Diyarbekir, the ancient Amida, the Muslims had already enlisted for their use the Byzantine fortifications built between 367–375 (as a Latin inscription attests), and again by a general of Justinian in 528 (as deduced from a Greek inscription at the Kharpuz Gate). Apart from Greek mason marks and Christian crosses carved in places on the masonry, the use of semi-circular arches serves as a constant reminder that the Muslims have only repaired or reconstructed a portion of those five miles of towered walls. The Mardin and Urfa gates of Diyarbekir are almost entirely Byzantine (except for some work on the ground floor in the latter by the Ortokid Muhammad, son of Kara Arslan in 1183). Of the most imposing of the towers in the curtain wall, the Kitshi Burg is largely Byzantine. The ground and first floor of the three-quarter round Ulu Badan 25 metres in diameter are likewise, though the second floor with groin-vaulted gallery serving loopholes, and the terrace with slits in square cut crenellations and box machicolations projected on mukarnas corbels.
were built under the Ortokid Malik as-Salih Mahmud in 1208-09 by the architect Ibrahim, son of Jafar. This is known from an inscriptive belt encompassing the tower, and above and below it are fabulous animal reliefs such as double-headed eagles and human-headed lions. The name of this same Ortokid ruler appears on the Yedi Kardash tower, but this time the whole of it is Muslim, having been constructed by Yahya, son of Ibrahim as-Sarafi, on the plan given by the ruler.\textsuperscript{43} In these fortifications of Diyarbekir too, an outsider was employed, for the name of the architect Muhammad, son of Salama of Edessa occurs on three of the towers dated 1088–1092,\textsuperscript{44} and it is remarkable that at exactly this time other Edessian architects were building the fortifications of Cairo. Again in 1226 Allaедин had been obliged to invite an architect of Aleppo by the name of Abu Ali to build the octagonal five-storey machicolated Kızıl Kule or Red Tower in the harbour city of Alanya which he had taken from refugee Armenians. Another architect of Aleppo, Shujauddin by name, erected some of the towers at Diyarbekir. Whether or not Bayazid’s Anadalu Hisar (1395) was erected by captive craftsmen, the fact remains that the fortifications are quite Byzantine in spirit. They were built at this point so as to deny the Byzantines access to the Black Sea. The same may be said of the Rumeli Hisar, built on the opposite shore of the Bosphorus, i.e. on the European side, by Mehmed II, the year before the Conquest in 1452, which are still in a fine state of preservation (Plate 100). The curtain walls were completed in a period of three months. These rise 40–50 feet high and are crested with flat-topped merlons and square-cut embrasures. The wall-walk dips and rises with the rolling terrain. The bastioned towers are round, square, or polygonal. Three great donjons appear at key positions, they average 80 feet in diameter and are six and seven storeys high. They were covered with conical roofs as is evident from a drawing of George Sandys in 1610.\textsuperscript{45} Chambers occur in the thickness of the walls, some provided with fireplaces. According to Evliya Efendi (1611–86) thousands of workmen and miners had been brought from Constantinople, and the architect himself was a Muslim living disguised as a monk in a monastery on the site.\textsuperscript{46} Whether or not there is any truth in this account, it may be noted that the inscription of 1452 on the north tower at Rumeli Hisar after praising Sultan Mehmed for ordering the construction of this fortress goes on to bless his servant, Zaganos Pasha (son of Abdullah) whose name is undoubtedly of Greek origin.\textsuperscript{47} The other two towers may have been built by the Vizirs Halil Pasha and Saridja Pasha, whom Ducas the Byzantine historian (c. 1460), mentions in this connection, but from the difference in character of the lower storeys one author believes that these Ottoman builders could only have increased the height of pre-existing 12th century Byzantine towers.\textsuperscript{48} Again when Mehmed was fearing a Venetian attack in 1466 his Florentine councillors and friends advised him to build the Castle of Abuse and themselves arranged its parts.\textsuperscript{49}

Byzantine architecture had influenced Ottoman mosques long before the conquest of Constantinople, as the buildings of Brussa indicate. At the Mosque of Murad I in Brussa (1363) the treatment of the façade is quite Byzantine in effect including the alternating courses of brick and stone in wall and arches, and twin windows in an arched frame,\textsuperscript{50} but the plan is unique in that there is a madrasa upstairs with chambers for students. Evliya claimed that the architect of this unusual mosque was a Frank.\textsuperscript{51} The Ulu Jami (1394–9) at Brussa belongs to quite a different tradition: in it one central bay with a lantern dome rising over a fountain\textsuperscript{52} makes it possible to dispense with the courtyard. The roof is covered by 20 cupolas of equal diameter with clerestory lighting in each (Plate 101). They rise from pendentives growing out of piers. The pendentives are generally smooth, but some have little triangles fused to them, and others have little squinches inserted at their base. The entrance façade is distinguishable only by the slight elevation of the middle dome and by the pair of minarets engaged at the corners. The interior is quite unimaginative and bereft of adornment, save for some highly suggestive painted inscriptions. This mosque, originally the work of one Muhammad son of Abdal Aziz, suffered some damage in the earthquake of 1855 and a fire of 1889.

The Yashıl Jami or Green Mosque in Brussa was erected by Iwad, the Pasha and Vizier of
Mehmed I, who, according to the inscription on the portal dated 1414–24, ‘designed, arranged, and fixed the proportions of this monument.’ Nevertheless, the plan of this edifice is clearly based on that of the Mosque of Ildirim Bayazid (1402) also in Brussa, and as such attempts to solve the problem of covering more central space with no intervening supports. The Seljuks had not been particularly obsessed by this problem. Although the Ortokid ruler Abul Muzzaffar Alpi had built a dome 13 metres in diameter and large enough to cover the equivalent of nine bays of the Mosque of Mayyafarakin (1152–80), no doubt in continuation of the tradition of Nizam ul-Mulk’s dome of 15 metres at the Masjid-i-Jami at Isfahan (c. 1085), and there was another such at the Ulu Jami at Van (where it is a mukarnas dome of hazarbat brick in two colours), they neither standardized this scheme nor saw any special virtue in it. Instead of continuing this practice of building large domes together with small ones on arched supports, the plans of the Ottoman mosques show that they either built one large dome over a single chamber, e.g. Allaudin’s Mosque at Brussa (1326), or of Haji Uzbek at Isnik (1333), or a number of them of the same size as the Ulu Jami of Brussa (1394–9) and the Eski Jami of Edirne (1404–14). The first mosque to break with these two traditions was that of Murad I at Brussa (1363) to which I have already referred.

At the Green Mosque at Brussa the plan is really a cross inscribed in a square such as was well known in the churches of Armenia (FIGURE 38). Domes are placed over all the chambers except the two flanking the entrance bay which are covered by groined vaults. The large domes over the mihrab and over the centre of the cross (10 metres in diameter) together result in producing a fairly large unrestricted space. The latter rises over a fountain, and is penetrated by a lantern (FIGURE 38). One of the noteworthy features of this mosque are the prismatic pendentives that accomplish the transition, probably a development of the exterior transition device at the Guduk Minare at Sivas. Here the triangular glacis is used in such a manner that the mediating zone becomes a succession of faceted conjoined upended triangles with alternately receding and re-entering planes. Later in Ottoman Istanbul the same crystalline form was used on capitals (FIGURE 40). The mihrab, dado, and the Sultan’s balcony are covered with glazed tile mosaic which gives the building its name. The floral arabesques, in a wider range of colours and in a freer treatment than anything Seljuk, seem to be Timurid in character and may be the work of artisans of Tabriz as were the tiles on the Minaret of the Yashil Jami at Isnik—1378–91, built by the architect Haji Musa. We need not assume that these were actually imported, although as the Spanish traveller Pero Tafur noted (1435–9), ‘they bring many things here from Persia.’ Indeed at the Yashil Jami at Brussa it is evident from an inscription on the mihrab tiles that the faience work was ‘made by the masters of Tabriz’, while Ali—son of Ilias Ali, who says in the inscription in the Sultan’s gallery (mahfil) that he completed the decoration of the mosque in 1424, is stated to have been Timur’s captive from Transoxiana in 1402. Moreover, the carved timber doors of the accompanying Green Turbe of Chelebi Sultan Mehmed (1421) were signed by yet another...
Tabrizi—Ali-ibn-Hajji Ahmed. Apart from the faience mosaic, which on the qibla wall of the Green Mosque revets up to a height of 30 feet, there are glazed hexagonal tiles coloured blue, green, or turquoise, set off with central gilt stencillings which make up the dadoes. Finally, there appears yet another faience technique, for example, on the mihrab of the Green Turbe, whose Spanish designation is cuerda seca or dry cord. This was in reality as substitute for mosaic, and enabled the inclusion of several colours on a single clay body. It was achieved by means of a greasy outlining pigment which burned dry and disappeared on firing leaving only ridges over the previously incized patterns. The technique resemble the cloisonne enamel of metalwork. Though such polychrome cuerda seca tiles appeared subsequently at Edirne in the Mosque of Murad II (1422), and at Karaman in the Imaret Mosque of 1432 (whose fine mihrab was removed to the Istanbul Museum), being revived again at the Mosque and Turbe of Selim I in Istanbul (1523), they eventually went out of favour and were displaced by a fourth technique not hitherto encountered. This was the painting in blue on tiles with a white slip under a transparent glaze, and is held to have been inspired by Chinese blue and white Ming procelain. At the Muradiye Jami in Edirne where they first occur in 1433, hexagonal tiles have underglaze patterns in cobalt on a white ground, while the spaces between the hexagons are filled with turquoise triangles converting the whole into stars. In the later development of underglaze painting tiles are simply square, and the painted patterns are seen to spill over onto contiguous tiles, while black is often used for giving the forms a sharp definition. It seems that the impetus to tile revetment for the monuments of Istanbul did not take shape until after Selim I was victorious over Shah Ismail at Chaldiran in 1514. Selim is reported to have brought back from Tabriz 700 families of artisans, most of whom appear to have been set up at Isnik. Specifically one Habib of Tabriz is mentioned in a list of 1525 as a faience worker brought back by him. The potteries serving Istanbul are at any rate known to have been situated at Isnik until they were transferred to the capital in 1726. They were then reestablished at the Tekfur Serai for fear that they would become moribund, since the demands of mosque building had appreciably relaxed. For the student who wishes to follow the designs and colours used by the Isnik potters through the course of the 16th century there is fortunately a continuous sequence of dated monuments.

We may now retrace our steps and examine Ottoman architecture at the capital from its inception. At the faience palace Tchinili Koshk built in Istanbul (1466–72), repaired c. 1580, the crossinscribed plan of Brussa was adopted (Figure 41), except that the building was raised over a basement storey, and domed rooms were added to each of the four angles, and all the rooms along the main axis of the cross were independently domed.

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**Figure 39** Brussa, Yashil Jami, plan

**Figure 40** Istanbul, prismatic capital
All these were then covered over by a flat roof with the exception of the dome with clerestory windows over the centre of the cross, which was however, too far over the centre to be visible from the front. The Persian influence in this palace is evident in the rib-fan pendentives, and the faience tile sheathing the portal. If the cupolas of the Uchsherefeli Jami, 'the Mosque of the Three Balconies', at Edirne were painted before the Conquest in 1448, as it appears they were, then we cannot underestimate the vigour and resourcefulness of this age. We see here floral details admirably disposed round a helical centre which gives rise to medallions marked out by knotted cords. In one of the domes the free vivacity of movement and torsion whirls of lines has no counterpart anywhere, and is the sort of design that might appeal to the contemporary imagination. The plan is of interest because for the first time piers are introduced to support the great dome thereby enabling the extension of space into domed side aisles. Here, too, four minarets are employed for the first time in a Turkish mosque (at the four corners of the court) and each one is differently decorated with brick inlay (such as is found in the Madrasa of Murad II at Brussa in 1447, (Plate 102) or by torsioned mouldings running spirally up the shaft.

When Mehmed conquered Constantinople he at first established the royal entourage at the Pantocrator on the third hill, but as soon as he had the leisure and opportunity he set about erecting the Yeni (New) Serai on the site of the wooded Byzantine acropolis on the promontory between the Sea of Marmora and the Bosphorus which has since come to be known as Seraglio Point. The extent and magnificence of Mehmed's Palace, between 1459–65, are described by the contemporary writer Cristoboulos of Imbros, while slightly later authorities specifically state that Mehmed imported architects from Persia, Arabia, and Greece for the project. Evidence based on the descriptions of Italian travellers of a somewhat later date seem to imply that the basic plan and disposition of buildings in what is now called the Top Kapu (Cannongate) Serai, follow the original layout, though of course the individual buildings date from various periods owing to the devastation of fires. Just as it is today, the Palace of Mehmed consisted of three great successive courts aligned on an axis with each one guarded by a gate. The first of these gates, the Bab-i-Humayun or the Imperial Gate has an Arabic inscription which mentions that the Serai wall was erected by Sultan Mehmed II in 1478.

The First Court beyond this gate appears always to have been open to the public, for the head gardener performed the executions at the fountain situated at the further end, and this act was always regarded as salutary for the populace to see. In this Court of the Janissaries, alternatively called Alai Maydan, Place of Processions, was the Imperial arsenal, a mint, an infirmary, and a bakery. Admittance to the Second Court could only be gained by those seeking audience at the Divan, and only the Sultan himself could enter it on horseback. One path on the left leads to the Hall of the Divan or Kubbealti. This court is entered through the Bab as-Salam (Gate of Peace) and the iron door in it is signed by the maker Isa ibn Mehemd, dated 1524. The present grilled oriel
balcony for the Sultan, situated high in the wall over the Grand Vizier’s seat in the Hall of the Divan is, of course, a later restoration of the Baroque period, and the two dates in connection with the work in this building are 1792 and 1819. It enabled the Sultan to observe or even spy over the affairs of the Council. A miniature in the Hunernama manuscript (1579–84) which gives much useful information on the Imperial Palace, shows the Emperor in his turret listening to an assembly of Viziers. In this Court were also the outer treasury and kitchens where great feasts were prepared. The Gate of Felicity (restored 1774) which leads out of this court into the next one has in front of it a wide eaved domed porch under which was placed a golden throne at the time of the coronation of the new Sultan, and here also certain ceremonies were observed in connection with the Bairam Festival. Opposite the entrance within the Anderun or Third Court, is the Arz Odasi, a much restored pavilion for the reception of ambassadors, and behind it is the white marble Library of Ahmed II (1719). It is believed to have been built on the site of Selim II’s twelve-columned kiosk which was in a pool. Ottaviano Bon who visited the Serai between 1604–7 also described a square lake for the recreation of the Sultan, and surrounding this was an aqueduct with thirty jets playing from it.

Attached to, and sometimes projecting into, the Third Court were the buildings of the Palace School, the Imperial Treasury, a Conservatory of Music, the Privy Commissariat where luxury amenities were stored, and the Pavilion of the Holy Mantle, to all of which the royal pages and white eunuchs were attached. The last of these buildings was erected by Selim I (1512–20) who brought back from Egypt the relics of the Prophet including his staff and seal. Later, Mehmed I (1730–54) extensively renewed this structure. The haramlik and salamlik were situated in complexes to the left of this court. Under Murad III (1574–95), who incidentally built the Court of the Queen Mother, an Italian physician employed by the Sultan was for the first time enabled to penetrate into this taboo territory, and has left us a brief description. According to this man, Domenico Hierosolimitano (c. 1580–90) there were 44 separate courts in the harem, each with its hall, chamber, bath, fountains, gardens, and aviaries. They were so disposed that it was impossible to see from one into the other, though the Sultan had access to them all by means of a secret corridor which enabled him to keep his visits to one hidden from the other. The bedsteads were of ivory inlaid with aloes, sandalwood, and coral. Once the Sultan’s children were over the age of six years they were transferred to suites communicating with their mothers’ room. We are fortunate in having this description since in 1663 a fire destroyed a large part of the harem, and only one of two portions have survived including Murad III’s exquisitely decorated room and anteroom with chimney-piece dated 1578, the quarters of the halberdiers (1586–7), and Ahmed I’s Library (1608). The restored portions after the fire date between 1665–68 and include the Court, Dining Room, Bedroom (renovated 1817) of the Valide Sultan (Queen Mother). The upstairs apartment of the chief Eunuch, with its tile panels including a representation of the Kaaba dates again from 1667, and is signed by Ali of Alexandria who has also executed the views of Mecca, Medina, and Mt. Arafat in the masjid of the black eunuchs. The four-storeyed quarters of these eunuchs suggest that a large number were employed to care for and keep the women-folk in check. In the Fourth Court or the Inner Garden, affording fine views of the Bosphorus, are those beautifully tiled and proportioned pavilions the Revan (Erivan) Koskh (1635) and Baghdad Koskh (1639), which Murad IV erected as memorials of victory. The latter, built, it is suggested, by the architect Kasim Aga, consists of four ivans converging onto a dome chamber with an arcaded portico on columns encompassing it. The chimney-piece is of gilded brass, there are sofas in the ivans, the woodwork is inlaid with ivory, mother-of-pearl and tortoise shell, the walls are inevitably tiled, and the upper windows have stained glass in stucco frames. The paved terrace with openwork parapet before the edifice, the wide eaves and above them a lanterrned dome with a companion conical chimney all add up to a picturesque effect. The buildings I have listed or described by no means constitute all those that remain at the Top Kapu Serai. I have said nothing for instance of the baths, the mosques, the
great stable, or the field for archery and dart practice. The visitor of today who is baffled by the emptiness of the vast courts and the hollowness of its rooms must remember that once the resident population of the palace was nearly 5000 persons, while a visit to the museums of ceramics, textiles, and arms housed here will enable him to picture in his fancies how these monarchs, the empire-builders and builders of great mosques, lived.

One of the first mosques of Istanbul—that of Prime Minister Mahmud Pasha (1464)—followed the Brussa formula of independent domes surrounded by smaller cupolas, but here an open porch preceded the entrance.

The Conqueror’s Fatih Mosque (1463–9) was built, according to an uncorroborated tradition, by the Greek architect Christodulos, though Turkish protagonists claim that its architect was Sinan ad-Din Yusuf bin Abdallah, an emancipated slave. Since this first of the Imperial mosques was destroyed by an earthquake in 1765 and completely rebuilt in 1771 in the prevailing style of the day, we are compelled to depend on the sketches and descriptions of travellers who saw it in its original form. We gather from piecing these together that the Selimya of Konia built some fifty years later was almost its replica (Plate 103). In the latter there is a portico of seven arches growing out of cream-coloured columns. A keyboard of seven cupolas rise correspondingly above, with a candle minaret at either extremity. The drum block rises steeply from the roofline behind these, and is capped by a lead-coated dome with a single buttressing half dome rising on the side of the mihrab.

Similarly, in the Mosque of the Agas of the Conqueror’s time, a porch, but on (Byzantine) semicircular arches, precedes the entrance. In the Mosque of Murad Pasha (1466), a pair of low domes cover the central space as at Brussa. A smooth minaret takes off from the side of the entrance façade on a square socle which is converted to the circular form by the multiple splays. The body of the building is alternately banded with brick and stone masonry. The Mosque of Rumi Mehmed Pasha (1471), a Greek converted to Islam, at Uskudar, appears somewhat like a minor Byzantine church with its large round-arched reveal containing several zones of windows. In the Mosque of Dawud Pasha (1485) a more gradual ascent from the substructure to the dome is attempted by the employment of sloping roofs and repeating members. The cylindrical minaret still has only one stage, but the height of the whole has increased. Here it rises on a bell-shaped base. The balcony is smoothly corbelled out without the intervention of stalactites, and the minaret is terminated by a pointed spire embellished with a finial of beads. The stalactite capital which is first used in wood on the 40 columns of the Ulu Jamia at Afyon (mihrab dated 1272, and mosque restored 1341), and adopted by the Ottomans at the Green Mosque in Isnik (1378), now comes to Istanbul in the Mosque of Firuz Aga (1491). The Mosque of the eunuch Atik Ali Pasha (1496) the dome over the mihrab is replaced by a hemicycle, while the lateral chambers are treated as integral domed bays. The arched voids of the exterior wall are barred with iron grilling, and plaster trellises fill the windows. Sharp cornices are introduced to demarcate the various forms.

In 1503 Bayazid II (whose mother was a French princess and never converted to Islam) turned down Leonardo da Vinci’s offer of building a huge single-arched bridge across the Golden Horn. Michaelangelo was also mentioned in 1506 in connection with this work. But some years earlier Bayazid had entrusted the Albanian ex-Christian Khairaddin with the building of his great Imperial mosque instead of his own chief architect Yaqub Sah. This Mosque of Bayazid begun in 1501 was completed in 1505, and survives almost intact to this day. As at the Uchsherefeli Mosque in Edirne (1448), where the narthex was first combined with the cloisters on the other three sides of the court, the court here plays a conspicuous role with each of its bays covered by domelets. Its high exterior wall is divided into two stories. In the centre of each side of the court is a tall portal of the old Seljuk type, only here the jagged edges of the stalactite are framed in a rising-step surround. In the middle of the atrium is situated a low canopied fountain with a wide projecting brim, known in Turkish as shadirvan. An imaginary line drawn from it in an oblique direction would just touch in succession the portal head, the porch cupola, the
abutment semi-dome, and end at last in the low lead-coated overlordig dome. This implies of course that the whole composition is perfectly stepped and graded. The first register is raised on an octagonal drum, the second on a semi-circular drum pierced by segmental voids, and the third on a spherical clerestory drum whose outward thrust is counteracted by pilaster strips and flying buttresses. In addition to these, counter-weights in the form of domical turrets fall away step by step on either side. The wind-blown fleur-de-lys cresting above the centre arch of the prefacing arcade is of the type encountered among the glazed dado tiles at the Cintra palace in Portugal (1508 and 1517). Had the pair of minarets been positioned on either side of the façade, the main structure would have looked somewhat cramped. They have instead been set back on the extremities of the two wings that project to left and right. This results in imparting a majestic amplitude to the mounting pile.

By the employment of two half domes the interior of the building was elongated in plan leaving a clear central space of 120 feet along the major axis. But this unilateral extension was not exploited visually as in Sta. Sophia (532–37) after which it was obviously modelled. At the latter the single-file storeyed colonnade leads the eye firmly along the nave. None of the Imperial mosques after this time have such closely ordered components to heighten the sense of single optical direction. Aside from this characteristic the Mosque of Bayazid has an unambitious interior with abrupt endings and horizontal zoning at inexplicable levels, though the painted ornament is not without a charm of its own (PLATE 104).

The next Imperial Mosque built in Istanbul was that of Sultan Selim I. The Selimiya, dedicated by Sulaiman in 1520, was completed in 1522. The architect of this work was not the great Sinan, as was once supposed, since the latter was involved at that time on campaigns in Belgrade in 1521 and in Rhodes in 1522. It now appears that the Selimiya, both in Istanbul and in Konya, were erected by Ali (d. 1537/8), known also as Esir (prisoner) or Ajem (Persian), since he had been brought from Persia after the Ottomans’ successful campaign. Apart from the cuerdas secas tiles there is little that is conspicuously alien about the plan or conception, which bears a striking resemblance to the Bayazid Mosque in Edirne (1485–8). In both instances the mosque sanctuary is a simple domed cube, and in both there are low laterally abutting multiple-domed entrance halls, a higher forecourt, and one-staged flanking minarets. (FIGURE 42). But in the Selimiya the cubical prayer chamber is better integrated with these other portions, and its severity is ameliorated by engaged buttresses at the angles and flying buttresses supporting the drum. The Bayazidiya on the other hand is
enhanced by being situated beside a stream, and by having in its complex a hexagonal mental hospital.

At this stage we may introduce Sinan, son of a Greek Christian known as Abd al-Mannan. Sinan was often described as Kodja Mi‘mar, the Elder Architect, in order to distinguish him from a successor of the same name. He was born in the province of Kayseri in 1489, was enlisted into the Janissary corps at an early age like many of his contemporaries, and was rapidly promoted to the rank of an army engineer by 1520. After engaging in a number of military campaigns he settled in Istanbul where he was appointed chief Architect (Mimar-Bashi) in 1539, a post which he held till he died in 1588. In his first major commission which was to erect the Mihirimah Jami after 1540 for the daughter of Sulaiman, Sinan had nothing to do with half-domes and instead livened the fenestrated lunette walls with a texture of honeycomb grilles which gives the chamber an effect of a huge lantern into which a misty light flows from all sides. At the same time he has relieved the blocky character of the exterior by means of stepped parapets and by polygonal corner buttresses capped by cupolas. Next, Sinan was ordered by Sulaiman to build a mosque in memory of the Prince or Shahzade (1543-8) to atone for the grievous wrong the Sultan had done his son. This time, starting with Khairaddin’s Bayazidiya, Sinan dispensed with the axial arrangement of a nave flanked by aisles, and developed the dome equally on all four sides. Thus the addition of two further half-domes resulted in a quatrefoil plan. Two of the four cupolas covering the side aisles were tucked onto the half domes. These so-called exedrae were derived directly from the Sta. Sophia since they were absent at the Bayazidiya. But unlike the Byzantine church there was no apse on the sanctuary and projecting on the exterior. Sinan must have realized the true function of these exedrae. From the point of view of the exterior they broke up the sheer wall, and added a stepped zone to the pile thereby graduating the ascent. In the interior they increased the area of uninterrupted central space, and built up the scale by the principle of diminution and multiplication of the parts. At Shahzade a single tier of stalactite cornice traverses right around and binds up the various parts into a single zone. In order to continue the graded development of the exterior Sinan added arched porticoes on the two flanks of the mosque. The arches are wider and consequently the bays larger than at the Bayazidiya. Indeed the arches are one-and-a-half times the length of the columns. These arches rise as they approach the centre to denote the location of the entrances. All the wall planes behind the portal are raised thereafter. And though an exorbitant number of voids invest the edifice with a restlessness, Sinan has accomplished what he set out to do: parapets, cornices, drums, cupolas and dome tumble one upon another and rise triangularly from every side. Not the blindest of bystanders can fail to be struck by the pyramidal resemblance. As for the minarets, they are polygonal in plan, each face adorned with tall carved panels.

**Figure 43** Istanbul, Sulaimaniya Mosque, plan
Since their height has been increased a second balcony stage (sherefeh) is introduced.

Another mosque built for Mihrimah, the Iskale Jami (1547–8) at Scutari, gave Sinan the opportunity to experiment by omitting the half dome toward the entrance, thus leaving only three, thereby placing it in a class by itself. Instead, the entrance approach was developed by the addition to the portico of an exonarthex, and projecting from the centre of this a porch covering a fountain.

In his masterpiece, the Sulaimaniya Mosque (1549–57) Sinan abandoned the attempt to centralize the plan and reverted back to the two half domes (Figure 43). But he compensated the other two sides, which would otherwise have been left with aisles of domed bays ineffectively camouflaging the lower areas of a bare lunette wall, by working out a system of organic buttressing (Plate 105). On either flank two buttress piers are placed on an alignment with the outer circumference of the dome which is about 90 feet in diameter. These rise as far as the parapet, are broken by string courses, re-emerge as tiny windowed cabins, and are then domed over. From the cabin, the buttresses run horizontally, then rise and are roofed over once more. After they repeat this stepping process they fuse onto the octagonal counterweights at the corners which sustain the thrust of the dome. At the base of the paired buttresses are two-storeyed galleries covered by a long sloping roof. Their horizontally stressed arcades seem to root the structure to the ground. The crest of the portal composed of sectioned fleurons falls from the edges obliquely, and rises toward the centre like the tiara of a monarch’s crown.

Even after making allowances for the strangling Turkish ancillary buildings at the base of Sta. Sophia,70 and the drudically clumsy buttresses which are also later additions on either side of its lunette arch, there is no doubt that it must have fallen far short of the marvellously controlled complexity of Sulaimaniya. True, the powerfully hunched half domes shouldering the great dome high in the air, has given way in the Mosque to jabbing little hop, steps and jumps. But then every step has a measured rise, and every line has a raison d’être that justifies its inclusion. The building does not exist for the sake of the dome as in the church of Justinian, but the dome for the sake of the building. It is no longer enthroned in the sky high above the rest, but is the natural culmination of the pile. Despite the varying size and shape of domes and arches the harmonious unity is unimpaired. By the addition of a second pair of minarets (following the precedent of the Uchsherefeli at Edirne) Sinan has made the forecourt play an intimate role in the total composition. Now the minarets not only have to relate suitably with the structure, but with each other as well.

Indeed, the whole elevation of Sulaimaniya is so unassailable that it could only have been designed from the point of view of the exterior, and this may explain why the interior does not live up to the same high standards. The interior of Sta. Sophia on the other hand attains a high degree of rationalism, and at the same time an extraordinary emotional elan. The light is subdued, and is kept out of the eyes. It descends in a golden halo from a ring of forty windows at the base of the dome, and from the fenestration in the lateral lunette arch. It falls on the strip carving of spandrels and capitals, on polychrome marble walls, on green and gold mosaic, and on columns of porphyry and verde antico. The side aisles are covered by groined vaults, and the space extraneous to the grand chamber is cut by arcades running along the long axis and emphasizing the length. Above this arcade, a second diminished tier of columns carries the women’s gallery. Both the arcades mask the shape of the perimeter walls which are lost in the womb of darkness that permeates the vaults. When the arcades approach the exedrae they carry on round it in a half curve. A pair of parapet railings following them in binding up the lateral walls to the half domes so that the boundary waves in and out. Thus the huge chamber is absolutely delimited, and the eye with its ambit ever enlarging is compelled to follow the delineated movements. A succession of scaling members swing the vision from arch to apse, thence to hemicycle and last of all to the magnificent dome hanging 180 feet above the gourd. Though this dome is over 100 feet in diameter, it does not seem to threaten with the
load of many tons, but to suggest a silken lightness. Only too well had Anthemios revealed a Divine Wisdom (Hagia Sophia) in his design, and had fulfilled Justinian’s ambition of raising ‘the widest dome to the highest point with the least signs of conscious effort’.

No wonder Mehmed the Conqueror was overpowered when he reined his horse, and for the first time entered this greatest church in all of Christendom. Far be it for him to desecrate this supreme testimony of man’s dedication to the Glory of God. Because of his intervention the mosaics were merely covered over with a light coat of plaster. From that day when the symbol of the crucifix was dismantled and replaced by the crescent banner of Islam, this building continued to play as vital a role in the society of Islam as it had in orthodox Christendom. In a sense it even increased in importance since it suckled every Imperial Mosque erected by the Ottomans. It is a tribute that the Sulaimaniya is the best of these precisely because it bears the closest affinity with its parent. And to put this even more strongly, at every point it deviates from its predecessor, at least as regards the interior, it is with doubtful benefit. For one thing, by means of the shadowy side aisles the Sta. Sophia leaves no clue as to how the lobed extremities of the central hall meet and reconcile with the rectangular outer walls. In the Sulaimaniya, the short and tall arches of the side screen leave the exterior walls exposed to view thus diffusing the self-contained volume of the centre space. It must be admitted that where there is a loss in rationalism there is perhaps a gain in romanticism, that is in the resulting picturesque informality and in the varying vistas (Plate 106). Aisles were of course, unnecessary to the Islamic ritual which has no processions. But regrettable is the manner in which the semicircular exedrae are brought down to the ground on two arches at right angles to one another, and the disparity daubed out by a slithering mass of stalactites. Nor is there a subtle building up of a scale. In the Church there is an additional exedra canopying the altar; in the Mosque the mihrab wall, with its jewelled stained glass set in plates of stucco by Ibrahim the Inebriated, is flat-backed and therefore abruptly approached. Moreover the modillion cornice and railing grille unnecessarily truncate the upward sweep with their dark belted line. The women’s gallery is absent since Muslim women are usually encouraged to pray at home, but Sinan has substituted a low tribune almost flush with the walls ostensibly for the nobility. They are too insignificant to add materially in heightening the sense of scale. The ash-grey walls lend a pious if somewhat sombre atmosphere to the interior, the alternate distemperings of the voussoirs call attention to themselves with their harsh tonal contrasts, the swarms of shiny lamps disrupt the free passage of the eye, while the monogrammatic placard blobs and the painted ornaments are hardly congenial to the wide expanse of space. We cannot blame the great master for some at least of these acquired blemishes. Much of the horticultural wallpaper designs were put on after the worst backwash of Parisian ornament spawned in the quiet waters of the Bosphorus and undermined local traditions. The rebuilt Fatih Mosque (1761–71) suffered drastically with these spurious tridimensional stencilled designs.

Neither was the Selimye at Edirne (1567–74) spared. The dome is painted on the interior like a canopy in a carnival, and spikes of wire fall from the rim in roundabout fashion to just over head height from the ground. The interior scheme is markedly original for Turkey, but there are resemblances with Sultan Qalaun in Cairo. The four piers supporting the dome have been increased to eight. A rectangular exterior is built around this columnar octagon, and again uncomfortably reconciled with it. The piers, half-engaged to the walls on the qibla and on the entrance side, are painted with mock capitals below the real stalactite capitals. From the lower capitals arches spring off from pier to pier. These arches are extended in depth in an outward direction so that they become small sections of barrel vault, against which the external wall is built. In the exterior the two zones of arches are apparent, the eight sides of the lower one being occupied by lunettes containing a double keyboard of windows. Staggered alternately in the zones are semi-cupolas playing an unimportant role in the exterior design. The mosque is hemmed in by four minarets like lanced sentinels that rise 272 feet high.
The mausolea of the Sultans in Istanbul appear to be sombre and sedate structures, but the interior of Sulaiman's Turbe (1566) is in fact bound to come as a shock, with its voussoirs of arches patterned with flashes of forked lightning. Unlike the Turbe built by Sinan for the admiral Barbarossa Hayreddin Pasha in 1541, with its chaste and severe octagon preceded by an entrance porch having capitals of crystalline form, that of Sulaiman is entirely surrounded by an arcaded ambulatory, while inside the deep wall arches have freestanding porphyry columns that help uphold the cupola. The canopy of this cupola is embedded with flowers of rock crystal around emerald cores. At the Turbe of Selim II (1574) it is apparent that the eight columns carry a smaller inner dome and that there are actually two domes, one enclosing the other. This ambitious design of Sinan succeeds in achieving a spacious interior by means of half-domes which fuse the square exterior walls onto the inner octagon. The ground space is well utilized by the numerous royal sarcophagi with turbans at the head of the male members of the family. There is a modest entrance porch with flying eaves. But on the whole none of these later Ottoman mausolea have such an attractive exterior as the Turbe of Mahmud Pasha (1462) where the face of the ashlar is embedded with overlapping polygons and cirelts of stars of pale turquoise tile following the Seljuk fashion. At best the Turbe of Prince Mehmed (1543–4) had a crested parapet below its scalloped dome, and there are engaged angle-shafts at the corners of the octagon. This latter feature is at the Turbe of the minister Husrev Pasha (d. 1545) crowned with little tourelles while the drum of the dome is engraved with ornament. Other turbes of the Ottoman Sultans interesting from the point of view of the ornamentation are at Brussa among which the most notable are the square Turbe of Ilderim Bayazid (1406), the octagonal Yashil Turbe of Mehmed I (1421), and the hexagonal Turbe of Prince Jem, really built for Mustafa son of Fatih, d. 1474 (PLATE 107).

Figure 44 Istanbul, 'Justinian's Aqueduct' (Rumpel)
apart from a number of secondary ones, 50 schools, 30 palaces, 25 mausolea, and 100 other structures including public baths, kitchens, viaducts, bridges, hospitals, boarding houses, shops, and caravanserais. Thus Ottoman architecture in its most flourishing period has the unique distinction of being a one-man achievement.

Moreover, the two Imperial Mosques built after his time followed closely in his trail. Both of them were based upon the quatrefoil plan of his Sulaimaniya. The first of these, the Mosque of Sultan Ahmed (1608–14), added one more exedra to each of the three half domes leaving only the mihrab flatbacked. This meant that the exterior could now mushroom forth with a total of 15 major and minor half domes each rising over the drummed base of the last, resulting in a perfectly co-ordinated hierarchy (Plate 108). Voids devour the drums as rapidly as the stops and gaps of a reeded flute. One would be inclined to feel that Mehmed Aga had not abandoned music for architecture as completely as he had believed. He did so, as he says himself, because he needed a more rigid discipline, whereas music he felt could not be disassociated altogether from sensuous pleasure. Because he did not bring a practised eye to his new profession he could not detect the flaws of his predecessor. Thus the exedrae half domes have been brought down to the ground in a deplorable manner with the right-angle again swashed with stalactite dentures (Plate 109). Arches spring from arbitrary points on piers or from some midway point on each other, and they vary in size and shape even when grouped in the same units. Consequently, there is no serial connection between supports, or evident relationship between arches. The load of the dome is carried on four huge cylinders (without any intermediate columns), which are fluted to disguise their lugubrious girth. The eye is hunted by glare from the incessantly doled-out fenestration now that the stained glass has gone. But above the belted cornice line, the forms are equal to the most unremitting examination, and a rare sense of spaciousness prevails. The surfaces themselves are clad in a shawl of blue-green stencillings. The painted posies and garlands in the upper areas are rendered with jewel-like delicacy, and embody a debonair freshness of vision. The tiles below the cornice are predominantly of blue enamel on a ground of white albumen glaze. At the Mosque of Rustum Pasha (1560), (with its four half-domes not on the axis but in the angles as were the exedrae), we see them at their best—these tulips, hyacinths, carnations, and roses in cartouches with serrated edged, in laminated sprays, or in braids whose tendrils bind the buds with blossoms in a cross weave. The colours represented here are a deep-toned Florentine blue, a light-hearted Alice blue and touches of enlivening Arras red. Excepting their plaster window grilles, and in the woodwork of their kursis and minbars, the Ottomans had no great passion for geometrical abstractions in their ornament. The flora retains a natural semblance despite its idealized outlines, that is to say the forms are handled without depth, shading, or perspective. The compositions in which they are arranged are rigidly symmetrical.

Were it not for the benign tamperings of philanthropy the architectural planning too would indicate a balanced development on either side of the central axis. One flank of the Sultan Ahmed Mosque is free of neighbouring buildings, and from there the minarets are seen to plunge dizzying heights—whilst against a twilight sky they seem almost startlingly alive. The dramatic effect is heightened by the addition of one more pair of minarets now making a total of six. They serve to stake out the boundary and indicate the immense area that is covered.

While the Mosque of Sultan Ahmed was built on the site of Constantine’s Palace fronting the Hippodrome on a level stretch of land, the last Imperial Mosque in the classical style, the Yeni Valide, founded in 1615 and only completed in 1660–3, is built on the foot of a slope which leads to the Golden Horn. But there is nothing new in it that we have not encountered before. The last attempt to depart from the well-trod way was made by Piyali Pasha, the Italian-born galley slave who rose to the rank of Admiral at a time when the Turkish navy measured up to any in the world. The minarets of his Mosque (1573) are centred like masts and approached from inside the building with the intention, it is said, to enable its founder to scuttle up to the watch, there to make believe of squalls and storms. However, we do not remember
this quixotic man for the unusual character of his mosque, but for the slave he freed on ransom who was none other than the author of that classic, Don Quixote.

Minor variations in plan continued after this time, but the fact remains that the mere reshuffling of features did not afford any new visual experience. European Baroque took a grip on Ottoman soil precisely because of this enfeebled native imagination. The ground was prepared by the political alliance with France's Louis XV. The Ottoman ambassador Yirmi Sekiz Chelebi Mehmed returned to Istanbul with glowing descriptions of the French palaces, and as a result Ahmed III built a palace in the manner of that of Marly, after designs brought from Paris. The style was adopted in religious architecture by the architect Simeon Qalwa in collaboration with Chelebi Mustafa in 1748. His Nuri Osmaniya Mosque (1748–55) went off on a rampage with broken cornices, wavy eaves, arching architraves, flamboyant window heads, triumphal entrances and arches with vousoirs atreble. Every feature deliberately sought to be wayward: flying buttresses have a warped twist, arches have depressed heads, capitals are sleeky bulibiform, pilasters are supernumerary, the cornice is moulded into the most impossible profiles, the quadrangle is yanked into an oval plan, the tribune gallery is turned into a royal theatre box, and finally the head of the portal is sponged clean of stalactites and replaced by greasy concentric rings of acanthus. The Kiosk and Courtyard of Osman III (1754–7) at the Top Kapu Serai are in the same vein for here there are garlanded urns reflected in the pool sunk in the paved court, while the building has undulating entablature and eaves, and the door lintel is plumped up like a pillow. Within are frescoes of landscape and surface stucco ornament in colour, carved, and gilded mirrors, and furniture upholstered with silks and brocades, all of which recall the Versailles of Louis XIV and XV.

Baroque had apparently come to stay, for it was very much in evidence in the Mosque of Nousretie at Tophane (1826) with its parapet urns, its rumpled scrolls, its wavering string courses, and its turrets with burgeoned bases. Nor was it less conspicuous in the Dolma Bagtche Mosque (1853) with its lopped-shouldered drum, or in the Mosque of Ortauey of the same year by the architect Nikogos Balian with its deeply projecting segmental cornices, drooping roofs, double angle piers flaring into turrets, and super-imposed orders carrying practically nothing (Plate 110).

In its own original setting Baroque had proved itself to be one of the most ingenious and overwhelming styles ever devised, but grafted onto an alien culture it transmitted little of its native fascination. The Europeanization of Turkey has been bolstered in recent years, but there are signs that some at least of her sons are recalling little by little the genius of their forebears. When shadows fall toward evening and the grey metallic surfaces are subdued, when a sunlit cloud etches their silhouette against the sky, or when in the nights of Ramadan they are enshrined with a necklace of golden lamps, then the Imperial Mosques of Istanbul are an inspiring sight.

NOTES

1. The mosque appears to have been repaired in many periods (see A. Gabriel and J. Sauvaget, Voyages Archéologiques dans la Turquie Orientale, i, p. 190f. and pp. 327–33). An inscriptional frieze around the court gives the following dates in clockwise sequence: on the west side of the south transept (of Malik Shah), 1090; on the west arcades, 1117–8 and 1124–5; on the north 1528–9 and 1223–4; over the entrance on the east, 1178, beside it 1163–4; and over the south arcades, 1155–6, followed by c. 1245, and returning once more to the transept, 1331. There is, however, a remarkable unity of style. A double order of columns with debased Corinthian capitals carry the entablature of the court façade. The shafts of the upper register are carved with a network of geometric relief patterns, and the intervening voids are topped by lintels whose load is relieved by almost horizontal arches above them. The lower arcades are pointed, apart from occasional broken-headed arches.


2. For example a 12th century Greek manuscript representing the Church of the Apostles in Constantinople has such knotted columns (Bibl.
Nat. MS. gr. 1208). Other examples are given by
W. Lamb in Annual of the British School at Athens,
xxi., 1914–15, pp. 37–8, who also traces the
influence of Christian miniatures in Seljuk portal
designs. (Ibid., p. 52f.).
3. V. Minorsky, Studies in Caucasian History, 1953,
pp. 93–4.
4. M. Van Berchem and E. Fatio, Voyage en Syrie,
1914–15, figs. 166–7, pl. 58.
5. E. Herzfeld, Corpus Inscription Arabicorum, Syrie
du Nord, 1934–55, i, pp. 119f., 255f., ii, pls. xliii
(a), cv(c), cx(a).
6. A. Godard, in Athare-Iran, 1936, i, pp. 135–8; and
Les monuments de Maragha, pp. 6–7.
7. D. N. Wilber, ‘The development of mosaic faience
in Islamic Architecture in Iran’, in Ars Islamica,
v, 1939, pp. 16–47. It is of course well known
that glazed polychrome brick had been employed in
Assyria by the 12th century BC and in Babylonia
and Iran by the 6th. But it is not often recalled that
the technique of glazed wall revetments was
probably imported from Egypt where it was
already in use during the First Dynasty and it is
found, for instance, in a chamber at Zoser’s Step
Pyramid at Saqqara (c. 2815 BC) and subsequently
at Tell el Amarna (1370 BC) and Heliopolis
(c. 1170 BC) (For use of faience wall tiles in
antiquity see R. A. Jairazbhoy in Pakistan
Quarterly, vii, no. 1, 1957, pp. 35–8).
8. Such cone-over-cupola structures are found in
Armenian architecture, for example at the Church
of Aghtamar on Lake Van, attributed to the early
10th century (cf. Architectural Review, vol. 123,
no. 734, 1958, p. 176).
9. A relief of the late Roman period portraying the
erection of a tomb shows it to have been of this type
with chapel above and mortuary chamber below
(see T. Schreiber, Atlas of Classical Antiquities,
1895, pl. 19, fig. 5). Cf. The Tomb at Mylassa in
Caria of the Roman period. (J. Fergusson, History
of Architecture, i, pp. 358–9).
10. The Medieval Islamic caravanserais on the Uzboj
river surveyed by the Russian expeditions were all
of circular plans. (Cf. M. Miletic in East and West
1959, nos. 1–2, p. 104).
11. F. Sarre, Reise in Kleinasien, 1906, p. 54. The
turbe of Sayyid Muhyyiddin at Ak Shehir (1224, reconstr. 1409) has an octagonal dome revetted
with enamelled bricks which is the work of Ahmad
bin Abdallah of Mosul (G. Mendel in Revue de
l’Art Ancien et Moderne 1908, p. 22).
12. Further evidence of Gothic intrusion in Anatolia is
at the Mosque of Sunghur Bey at Nigde (1335),
whose east porch has an entrance vault on
quadripartite ribs with bar tracery grilles in
tympanum, but these are evidently spoils re-used
from a church.
13. E.g., F. W. Hasluck, ‘Stone Cults’, in Annual of
the British School at Athens, xxi, 1914–15, p. 70f.;
also Christianity and Islam under the Sultans,
1929, i, pp. 195, 198. For the practice of rag-tying
elsewhere see N. Chaudhury, in Indian Culture.
14. E. Herzfeld, in Ars Islamica, x, 1943, pp. 13–70,
fig. 83.
15. G. Meier, Die assyrische Beschworungssammlung
Maql, 1937, p. 60; B.L. Goff, in Journal of the
Warburg Institute, xix, 1956, p. 13.
The pagan origin of the practice is at once evident
if we recall that when describing the rebuilding of
the Temple of the Moon God at Harran, Nabonidus
says that on either side of the Eastern gate of the
building he placed two lakhmu gods to ‘lay low
my enemies’ (Langdon, Nebabylonische
Konigsschriften, p. 222f.). Recent excavations
have revealed that steles from this very building
of Nabonidus were reused by the Muslims face
downwards before the entrance of the Great
Mosque at Harran (D. S. Rice, in Illustrated
is true, are not dogs but one of the offsprings of
the monster of chaos Tiamat (cf. Langdon, in J. R.
A. S., 1932, p. 927). However, a convent building
of Nabonidus at Ur did have two little bronze
figures of dogs (L. Woolley in J. R. A. S., 1929,
pp. 690–1) and these must clearly have served an
apotropaic function (cf. Meissner, ‘Apotropäische
Hunde’, in Orientalistische Literaturzeitung
(Leipzig) 1922, pp. 201ff.). Moreover, clay figures
of dogs are specifically referred to as being buried
in the kama or principal gate (S. Smith, in J. R. A.
S., 1926, p. 700, no. 22).
17. V. Minorsky, A History of Sharvan and Darband,
1958, p. 88, n. 1. The walls at Darband also had
figures of two lions, lionesses, and ‘a man with a
fox holding grapes in its mouth’.
18. S. P. Tolstov, Auf den Spuren der Alchorsch-
mischen Kultur, 1953, p. 267.
19. Guide des lieux de Pelerinage, tr. Sourdel-
Thomine, 1957, p. 145.
20. The immediate inspiration derived almost certainly
from the 6th century churches of Syria, e.g. the
chapel at Kokanya has a cross in a roundel at the
apex of the window while the base of the frame is
curled into knots (de Vogüé, La Syrie Centrale.
pp. 1, 120). But a magical origin is not thereby negated as Ibn Khal'dun says, the knot in the performing of magical rites stood as a symbol for 'resolution and persistence' (Prolegomena, tr. de Slane, I, p. 77). It should be noted that the Quran condemns sorcery by means of knots (cf. Frazer, Golden Bough, Taboo, 1936, p. 302).

21. A Muslim legend has it that Solomon knew 'the art of kneading stone, and moulding it into various shapes, in the same way that a pastry-cook or a baker moulds dough'. As an example of this work the local inhabitants point out some curiously twisted rope-like marble shafts in Jerusalem (J. E. Hanauer, Folklore of the Holy Land, 1935, p. 41).


22a. In 1235–6 a Mongol envoy went to the court of Kaikobad at Konia and ordered him to submit, according to Munajjim Bashi. Nevertheless in the following year a body of 10,000 Mongols invaded Rum (C. D’Ohsson, Histoire des Mongols, 1834, III, p. 79).

23. R. M. Riefstahl, Turkish Architecture in S. W. Anatolia, 1913, p. 67, pl. 125.

24. M. van Berchem, Amida, fig. 32.


26. Sarre and Herzfeld, Archäologische Reise.....I, p. 35.

27. Abu Shamah, cited by Le Strange, Baghdad during the Abbasid Caliphate, 1900, pp. 274–5.


29. F. Sarre, Die Kiosk von Konia, 1936, Abb. 25 cf. pl. 11, also W. Hartner, in Ars Islamica, v, 1938, pls. 26, 28. For further examples with affiliations East and West see E. Kühnel, 'Drachenportale', in Zeitschrift für Kunstwissenschaft, iv, 1, 2, 1950


32. A close parallel is also the storeyed altar chapel of the Roman period in the court preceding the Temple of Jupiter at Baalbek (restored in P. Collart and P. Coupel. L'Autel Monumental de Baalbek, 1951, pls. i and ii). K. Erdmann prefers to see the influence of the Sassanian Chahar tak ateshghahs or quadrifrontal fire temples (Yilik Arastirmalar Dergisi, Ankara, n Sayi, 1957, pp. 93–5).

33. Ayyubid caravanserais of Syria such as Al-Kaife and Al-Kosair (second half of the 12th century), and Khan al-Arus (by Saladin), Khan Toman (before 1189) and Al-Etne (before 1234) are far less imposing. They simply have deep entrances with flanking guard chambers, barrel vaulted galleries of rough masonry surrounding the court, and arched openings of ashlar leading out onto it (G. Sauvaget, in Ars Islamica, 1939, pp. 48–55). After the 14th century some Turkish khans served also as market with shops attached. The main half of Seljuk caravanserais are of three types; (i) Wide nave and side aisles, all three barrel vaulted and strengthened by cross arches, (ii) Square type with five barrel vaulted aisles, a dome in the centre and a barrel vault leading off from here across the aisles, (iii) Similar to the latter but with vaulted aisles running parallel to entrance (see K. Erdmann, in Kunst des Orient, ii, 1955, pp. 5–29). For yet other types see K. Erdmann, 'Seraybauten des dreizehnten und vierzehnten Jahrhunderts in Anatolien', in Art Orientalis, iii, 1959, pp. 77–94.


37. H. M. Elliot and Dawson, The History of India as told by its own Historians, 2nd edn., 'Akbar', Badaoni, 1953, p. 132.

38. The conical roof on a round substructure was evidently known prior to the Muslim advent in Asia Minor (Texier, Descriptions de l’Asie Mineure, ii, pl. cxxx).

39. It has been suggested that the purpose of this opening up was to give to the prospective occupants of this tomb or to the pious visitors a view of the fine surrounding countryside (H. F. B. Lynch, Armenia, 1901).

40. The Parthenon was converted from a church into a mosque in 1458. Thus it remained for over 200 years when a Venetian shell blew up the interior of the Greek temple. In this hollow interior a chalet-like mosque with a red-tile roof was erected.

41. A. Gabriel, Voyage Archéologique dans la Turquie Orientale, i, pp. 85–182.

42. It is interesting to observe that the inscription calls him a falcon, and below it on the keystone is actually carved a falcon, while dragons with
51a. It is related that at the time the Ulu Jami in Brussa was to be built, a woman owned a house on the middle of the site. She refused to sell it, so they were compelled to erect the mosque around it. When the house was ultimately acquired, they decided to replace it with a fountain (Tashköprülü-zade, Shakaayik-i Nu‘ maniyye, tr. Mecidi Efendi, Istanbul, 1269, p. 5).

52. Also Church of St. Peter and Mark in Constantinople. Oldest of the cross in square plan are the late Roman tombs: the Tomb of Hass in Syria and of Tabar-Bur in Transjordan (Monneret de Villard, La Nubia Medioevale, III, 1957, pp. 44–9).


54. The last faience work in the Seljuk style was in the mihrab of the Mosque at Birge (1312–13) after which the technique appears to have died out in Anatolia.


56. Taeschner, in Der Islam, xx, 1932, pp. 139–68.

57. R. M. Riefstahl, ‘Early Turkish Tile revetments in Edirne’, in Ars Islamica, iv, 1937, pp. 259–69; and A. Lane, Later Islamic Pottery, 1957. They appear to have survived until 1548 when they were used in the Turbe of Prince Mehmed son of Sulaiman (O. Aslanappa, Turkish Arts, Istanbul, n.d.).


59. Turbe of Selim I (d. 1520), Mosque of Selim (1523), Imaret of Roxelana (1539), T. of Shah Zade (1543), M. of Ibrahim Pasha (1551), T. of Roxelana (d. 1558). M. of Rustem Pasha (1560), M. of Mehmed Pasha Sokollu (1571), T. of Selim II (1576), M. of Atik-Valide at Scutari (1583). Migeon & Sakisian, ‘Les Faïences d’Asie Mineur’, in Revue de l’art Ancien et Moderne, xll, 1923, pp. 353–64.) It is the view of these authors that the new naturalism which emerged in the second half of the 16th century was not due to the influence of textiles, as was supposed, but to the realistic spirit of the Renaissance through contact with Italy.

60. The sloping lie of the land has necessitated the insertion of a second basement storey at the rear.

61. At any rate among the painted decorations of two of the domes of the courtyard there occurs the name of Murad II (1437–47), (Osman Rifaat Bey, Guide d’Adrianople, 1920, p. 6).

61a. Note however the bird and deer panels (Oktay Aslanappa, Turkish Arts, Istanbul, n.d.).

62. For plans, detailed descriptions, and history, see B. Miller, Beyond the Sublme Porte, 1931; N. M. Penzer, The Harem, 1936; and Istanbul Muzeeleri, Guide to the Museum of Top Kapu Saray, 1936. For Evliya’s statistics see Narrative Travels, tr. J. von Hammer, 1, p. 50; for the Fatih Koshk see Ekrem Hakki Ayverdi, Fatih Devri Mimaris, figs. 325f.

64. Byzantine buildings were protected above with lead sheets. Constantios (1834) cites Ducas in stating that Mehmed II reused lead sheets from Byzantine roofs for his own palace. (Ancient and Modern Constantinople, tr. J. P. Brown, 1868, pp. 89, 97). A Turkish document of 1579 records that lead was sent from Istanbul to repair the mosques of Tripoli, the Omeyyad mosque of Damascus, and to the Dome of the Rock whose lead had been stolen (U. Heyd, Ottoman Documents on Palestine 1552–1615, Oxford, 1960, nos. 100, 102). The Damascus Mosque already had roof plates of lead each of which, according to Dimishqi (c. 1300), weighted up to a 1/2 qintar or about 40 lbs. (Manuel de la Cosmographie du Moyen Age, tr. M. A. F. Mehren, 1974, p. 262). In Turkey the Mosque of Isa Bey at Ephesus was roofed with lead according to Ibn Battuta c. 1350 (tr. Gibb, u, pp. 444–5).


66. In Syria we find it at least as early as the Madrasa Kamaliya (1251) in Aleppo—on the columns around the court. (See Sauvaget, ‘L’architecture Musulmane en Syrie’, in Revue des Arts Asiatiques, viii, 1934, pl. xvi, p. 38).


68. At the Sta. Sophia such domical turrets cover staircases, which belonged to minarets originally occupying this position. (W. Emerson and R. L. Van Nice, in American Journal of Archaeology, vol. 54, 1950, pp. 28–40).


70. The numerous college buildings of the Sulaimaniya on the other hand are, as at the Fatih Mosque, kept at a respectable distance outside the rectangular enclosure. In the history of Mehmed the Conqueror by Kristovoulos (tr. C.T. Riggs, 1954, p. 141) the Mosque annexes including food kitchens for the poor, inns and baths, are stated to be well situated in point of usefulness, beauty, and size. Moreover, the sixteen madrasas attached to the Fatih Mosque make it a kind of university.

71. Safer Efendi wrote for him a Handbook of Architecture entitled Risalei-Mimariye, in which is set out details of the approach of the contemporary architect to his problems, etc.

72. The story that Sultan Ahmed built the seventh minaret for the Kaaba to satisfy the complaint of the Imam of Mecca cannot be true since Sulaiman had already built the seventh one there, and this is depicted in a 16th century miniature (J. Deny, in Die Welt des Islams, N. S. vi, nos. 1–2, 1959, p. 9). Ibn Jubayr had already encountered 7 minarets at the Haram at Mecca in 1183 (tr. Broadhurst. p. 90).


74. The French style entirely usurped the native one in Palace architecture when rulers such as Selim III (1789–1807) had Frenchmen as their intimates and tutors. It is known that the plans for the kiosks at the Sweet Waters were brought from Paris by M. Lounar, first dragoman of the French Embassy in Istanbul. The Sweet Waters Palace itself dates from 1815 and is followed by the Dolma Bagtche Palace by the architect Balian in 1853, and Beylerbey Palace in 1865.
Not for over a century after the battle of Nihavand (642) did the Persians begin to regain something of their past prestige, and this was after the Caliphate capital was moved to Persian territory. Baghdad was after all only a few miles from the old Sassanian capital of Ctesiphon. By degrees Persian chieftains were granted lands for their services, and eventually the governorships of provinces. One by one they became autonomous, and as the capital declined they were on the upsurge. The Buyids in Central Iran, the Samanids in Turkestan, and the Ghaznavids in Afghanistan each have their heyday, and end up by attempting to demolish one another. They have not finished bickering when a powerful band of Turcoman nomads makes short shrift of them all. In 1055 Tughril Beg jauntily makes his way to Baghdad, and invests that 'shining city of song' without striking a blow. He is received by the powerless Caliph who, having no other alternative, appoints him with mock ceremony as sovereign of East and West. Tughril lays the foundation of the Seljuk Empire, which is extended by his energetic successors Alp Arslan (1063–71) and Malik Shah (1072–92) until it stretches from the shores of the Mediterranean to the Steppes of Central Asia. Under the guidance of their Prime Minister Nizam-ul-Mulk, that extremely able organizer and author of an important treatise on statecraft, there is a renewed flowering of poetry, mysticism, philosophy, architecture, and astronomy in Iran.

After the tragic death of Sultan Sanjar (1118–53) the splintering process might have begun all over again. But it had not proceeded far when out of the flood gates of the North there poured that terrible visitation of the Mongols. Led by Jengis Khan, they plundered and rapined with brutal savagery. The approach of every town was marked with a pyramid mound of human skulls.

Baghdad, destroyed in January 1258 by Hulagu, was perhaps the worst hit of all. Chang Te sent by the Emperor Mangu Khan in that year reported that the Caliph's palace with its walls covered with black and white jade was constructed with fragrant and precious wood so that owing to the conflagration the air was heavily impregnated to a distance of a hundred li or about thirty miles. The practice of employing aromatic timber in construction was an ancient one, and here we may refer to but one example: an inscription of Nebuchadnezzar found in Lebanon refers to cedar with pleasant scent which he had transported for his use. Hulagu himself appears to have borrowed the idea from Baghdad, since his palace which was transplanted from Tabriz to Sultanya by Uljeit is said to have been entirely of cypress and aloe wood, later faced with faience tiles.

Only the most stubborn or isolated buildings could have outlived the Mongol onslaught, and they must be but a fraction of those that perished. How incalculable this loss must have been can be gauged from the fact that we can enumerate over 90 exactly dated buildings from literary sources that were erected before the year 1000 alone. The excavations at Nishapur suggest the wealth of art that lies under the soil from the pre-Mongol period, i.e., before the destruction in 1221. Among the finds at this site were incised, engraved and enameled vessels of glass, ceramic bowls with floriate margins and flamboyant inscriptions, carved brick friezes in a strongly relieved monumental style, gaily painted frescoes with undulating scarfbands terminating in dotted eyes and magical hands, and more particularly a (mukarnas?) niche painted in this manner.

From casual references in literature we have a tantalizing glimpse of the medieval palaces of Persia. We hear of the Tahirid ruler Abdallah building the fine suburb of Shadiakh to Nishapur where he constructed a palace surrounded by the houses of the officers of his army. Then we learn
of the Palace of the Buyid ruler Adud al-dawlah (c. 955) in Shiraz having 360 rooms with marble facings and porcellaneous colour and its library with paintings. At Siraf, a trading port on the Gulf destroyed by an earthquake in 977, were wealthy men who, according to Ibn Haukal spent as much as 30,000 dinars on the building of their houses.\(^7\) Abu Dulaf (c. 950) says that at Samiran the Daylamite king’s palace complex consisted of some 2850 large and small buildings, and the king had painstakingly gathered together 5000 craftsmen whom he kept under custody while at the same time providing instruction in crafts for others of his subjects.\(^8\) But now since the identification and excavation of the Ghaznavid Palace at Lashkari Bazaar in Afghanistan in 1948 we can begin to fill in the gap in our knowledge of medieval secular architecture. Situated beside the Helmand at its confluence with the Arghandab west of Kandahar, rise the ruins of three palaces of which the largest on the south of 550 x 330 yards is the only one so far described by the excavators whose final report has yet to appear.\(^9\) The site fits the description of Muqaddasi who says that half a league from Bast the Sultan has built a small city called al-Askar, ‘the Camp’, where he resided. Baihaqi secretary at Ghazni writing in 1059, speaks of Bast as the camp of Mahmud (998–1030) to which his son Masud (1030–41) (who, he says, designed his own buildings and was specially skilled in geometry) had made many additions, including a game enclosure.\(^10\) The avenue of approach to the southern palace is flanked by the ruins of a bazaar where coins were found dating up to the death of Mahmud. Within the large enclosed forecourt of the palace the ground plan of a mosque is visible along one side. The fortified entrance façade to the palace proper is treated with two ranges of blind arcades resting on engaged buttresses and serving to frame decorative medallions in stucco, most of them now fallen into the debris. The entrance, blocked up in a restoration and replaced by a bent entrance on the east side, opens into a cruciform vestibule between two of whose arms is a small basilical hall.\(^10a\) The vast interior court has an iwan in the centre of each of the four sides, while in between are the official quarters. The large iva\(n\) on the main axis leads into what had been regarded as a banqueting room, since there is a spacious brick-paved platform ascended by steps occupying the centre. On a colonnette which may have been part of its balustrade is painted the head of a youth with demure elongated eyes and wearing a headress. In the large audience hall which is beyond this room the side walls are entirely surrounded in their lower part (except where there are door openings) by paintings in distemper of a frieze of men. They are depicted frontally (though their faces have been lost due to burning of wood inserted in the wall at that height), they are clad in caftans of rich coloured silk held close by belts, and they bear arms resting on their right shoulder. One of the excavators was reminded of the Achaemenid royal guards represented at Persepolis and Susa, and he cited Juzjani to the effect that Mahmud had a guard of 4000 Turkish slaves who on the days of audience were ranged on both sides of the throne, those on the right bearing golden arms and those on the left silver arms.\(^11\) In Mahmud’s Palace in Balkh, according to the poet Farukhi, the two-winged building in the midst of a garden had alcoves decorated with wall paintings including the portrait of the king both feasting goblet in hand and engaged in battle armed with lance.\(^12\) We also know that one of Mahmud’s palaces was decorated with pictures of himself, his armies and his elephants,\(^13\) and that his son Masud had indecent pictures painted on the walls of a pavilion in Herat which were plastered over when his father came to hear of them.\(^14\)

The audience hall at Lashkari Bazaar, circumscribed by a corridor, overlooks the river on one side. In its middle is a raised water basin with a channel in the pavement leading off on both sides. These went through to small private courts, each with its own basin, and around which there were self-contained suites of rooms for dwelling. We know from Minhajuddin and Juzjani that the palaces at Bast were destroyed by Khudud in 1149, so that we now have a date for the destruction by fire. But we also have a partly preserved date some time between 1155–64 which suggests that the palace was reoccupied by Ghurid governors,\(^15\) and we can attribute to them the closing up of doors, the carved terracotta geometric
panels at the entrance, and the little private chapel inserted in the audience hall where the stucco revetment consists of small scale floral elements enclosed in hexagons in contact with a border of inscriptions. The palace was probably abandoned after its destruction by the Mongols in 1221.

Other medieval Muslim fortifications recently surveyed and published are in Sistan on the S. W. frontier of Afghanistan. At Tar O Sar there are three concentric, approximately oval fortified walls, each wall having interesting examples of bent entrances. In the ruined buildings between the walls we not only find polyfoil and exaggerated horseshoe arches and vaulted squinches, but also stepped niche arches in corbelled brick probably of the 11th or 12th century. The fortifications of another site at Chakansurak are ingeniously contrived. The enclosure wall is engaged with round tapering towers covered with domed turrets, and the rampart has arrow-slits at the end of embrasures for bowmen. A square advance tower stands to some distance in front (like the albarana tower of Andalusia) and is connected to the enclosure by a ramp rising into a wall walk bristling with angled loopholes. The entrance to the enclosure is inserted obliquely at the foot of the ramp and is therefore quite effectively protected.

Returning to Iran proper we find that one of the earliest surviving Islamic structures is the Mosque of Damghan (c. 775) and it is still closely modelled on Sassanian forms, here of course, adapted to a new ritual. There are plaster covered cylindrical brick piers and elliptical arches with the barest suggestion of veering on a point. The arches run toward the qibla on the longitudinal axis, but are parallel to it on the lateral sides of the court. The same is the case at the Mosque of Nain (960) except that here there is greater irregularity which suggests restoration at later dates. The carved stucco revetment is also of uneven character. Thus the typically Iranian flat-backed circumscribed mihrab arch is narrow and jammed with coarsely perforated pendulous lumps, whereas in the soffits of some arches are well-spaced rosettes and palm-leaves stiffly enchaîned together with due regard for architectural form, while the cylindrical piers have been carved with interlacing straps. It would seem that from Samarra stucco styles had been disseminated on the one hand to Nain in Persia and beyond, and on the other to the Ibn Tulun Mosque in Cairo (876–9), and thence to the Coptic Monastery of Deir as-Suryani (914) in lower Egypt. We must assume that they prevailed in the lands between for we have another vestige in the south side of the 11th century Karmathian Mosque at Manama in Bahrain.

Ever since the Palace of Ukhaidar was built it was realized that an even more economical form of enrichment could be obtained by manipulating the building materials themselves into devious patterns. The technique of hazarbaq brickwork was over a century old when the Tomb of the Samanid rulers was built at Bokhara (between 913–43). The bricklayer had used the bricks in header, stretcher, and soldier bonds to form pearl band, chequerboards, dentils, and herringbone diapers. The result is that the walls do not seem to be compounded of terracotta and oven-baked brick, but something that more nearly resembles wickerwork cane. These crocheted walls have been given a slight batter as if to counteract the thrust of the dome (FIGURE 45). The angles of the tomb are cut away and hinged with cylindrical piers, and the entrance arches in the centre of each side are placed in sunken frames. The cubical chamber with its weighty hemispherical dome bore a general resemblance to the old fire-temples of the Zoroastrians some of which were preceded by a vestibule porch or surrounded by an ambulatory, which latter in this instance had become a gallery at clerestory level. The four cocoon-like domes surrounding the main dome might have been modelled on the Fire Temple at Gura (399–428). Such a building might well be expected of the Samanids who openly expressed pride in their Sassanian ancestry.

The practice of erecting canopy tombs was still in its infancy in the 10th century, but thereafter it began to gain ground rapidly. Already in 1056 the octagonal domed tomb at Abarqah known as the Gumbad-e-Ali, commemorating Amidal Din Shamsal Dowlah, has an immaculate proportion. It is also sensitive to texture despite its use of smoothly-faced rubble stone—the interstices of mortar imbuing it with a rustic effect. Here for the
Figure 45 Bokhara, Tomb of the Samanid rulers (Rempel)
first time alveoli cells (mukarnas) are made use of to flare the cornice forward for no other reason than to demarcate firmly the sub and superstructures. The situation of this feature in the cornice reminds us that the Arabic word mukarnas derives from the Greek equivalent koronis meaning cornice.22 Previously, for example at the round funerary tower of Ladjin (1022) in Mazenderan there was a register of blind arches at the cornice.23

With all this we are left in the dark how such a complex scheme as the Tomb at Imam Dur, north of Samarra, could have been built as early as 1089 by a Shia Arab, Muslim ibn Quraish, as a mashhad for the son of the fifth Imam, and this surely brings eminence to its architect Abu Shakir Abul Faraj. For here the first mukarnas dome appears well-nigh fully fledged. It still grows out of the cubical chamber which is reinforced at the angles with engaged cylindrical buttresses as at Bokhara, but there the resemblance ends (Figure 46). Above it is an octagonal drum followed by three successive octagons with concave sides superposed one upon another. Filling part of these concave planes are bulging quarter domes, while the circular uppermost stage culminates in a little cupola. The interior of this fantastic dome is clouded with soft moulded plaster made somewhat confusing with endlessly dentated lines. When this type of mukarnas dome was emulated by Nuraddin24 at his Maristan (1154) and Mausoleum (1172) in Damascus the character of the interior became clarified. Tiers of ‘alveoli’ cells mount upon one another in orderly array, and this inward corbelling goes on equally from all sides instead of from the corners alone. When the area is contracted sufficiently the shell-fluted dome of small diameter surmounts it. In Syria mukarnas was applied to entrance vaults with great effect.

**Figure 46**

Imam Dur, Mausoleum of the son of the 5th Imam (Herzfeld)
The system of cells and corbels with fluted conch inserts in the entrance vault of the Zahiriya Madrasa (1277) at Damascus seems so involved in its alternation of planes, rotation of axes, and in juxtaposition of angular with curvilinear shapes that the most expert mason today might puzzle as to how the blocks of carved stone were interlocked together. Stalactite vaults in Syria seem to be carved on a succession of oversailing lintels, but from the portal of the castle at Sahyun (118), part of which had fallen and was repaired, it is evident that the niches and corbels are carved in groups on masonry blocks.25

In Iraq the contemporary technique was rather different, since the material was brick. At the so-called Abbasid Caliph Nasir’s river-side Palace at Baghdad (1179–1225) an exciting vista is produced by the recently restored honeycomb vaults covering the full length of the cloisters of the court (PLATE 111). One cannot help marvelling at the proficiency that went into this cellular multiplication, nor suppress the feeling of inspired fantasy that motivated such a theme. Despite this being a pre-Mongol building, a considerable proportion of decoration has survived in the unrestored parts, particularly in the surviving iwan and this is largely due to the fact that it is not executed in plaster as at first it appears, but has tenuous incised designs contained within geometrical bounding lines carved on the brick itself.26 This technique is known as hasiri, and it would appear that the varying sizes of bricks were precut before being assembled into their respective positions on the wall. The steep canyon corridor behind the dwelling cells of the court, which communicates with the various halls now employed as a museum, was probably roofed as at present with light streaming through its ceiling vents. The Avesta has the word rocanam meaning an opening for smoke and light in the roof, and it is suggested that the Achaemenid palaces had this feature since there were so few windows in the vertical walls.27 In one case, in the Tomb traditionally though erroneously held to be of Sitt Zubeida, wife of Harun al Rashid, in Baghdad (c. 1151), the mukarnas cells of the dome are pierced, and through these the sky is glimpsed, and the light flickers through (PLATE 112). The exterior form of this dome recalls a pinecone. It is notable that a domical chamber in the Imperial Palace at Constantinople in the 13th century was described as a Persian work and named after the Arabic and Persian machrutha, for pinecone.28

Meanwhile yet another type of tomb chamber had made its appearance in the Caspian littoral under the Ziyarid dynasty. In its simplest form it consisted of a tall cylinder of brick covered by a conical roof. Although the Gunbad-i-Qabus at Gurgan (1007) is the earliest of this type that survives (and the earliest inscribed Islamic monument in Iran), it embodies a subtlety and daring never equalled in later times. Like the Pharaohs of Egypt, Qabus ibn Washimigir figured larger in death than in life, but unlike them he did not smother his corpse deep in the terrain, or raise a triangular tumulus above it in an attempt to ‘choke the sky’, to use a phrase of Ibn Jubayr. Instead, he had his coffin hung 150 feet above the ground29 in the ‘war-head’ cone—according to Jannabi30 in a glass coffin suspended by chains.31 A window opened to the outside world and let in the sun every dawn.32 The title Shams-almaali which he had received from the Caliph meant ‘Son of the Heights’. Here also he must have felt nearer the night stars that he had devoted himself to studying all his life. It was to him that the astronomer al-Biruni had dedicated his Chronology of Ancient Nations, c. 1000, a technical treatise on the computation of time by the ancients. Looking at this tower, it is easy to think of the poet-astronomer as a passenger in an enormous rocket, an impression heightened by the eye-flux caused by keen-edged buttresses (FIGURE 47) that seem to slice through the air.33 The shaft has a 50 foot diameter at the base, and the brick foundation is claimed to be over 35 feet deep.

Within the next three centuries, many such tombs were erected in northern Iran. In general their shafts become stockier, their flanged buttresses increased in number, and their cone was made to rest on niched or trilobed squinches. Thus they no longer resembled rockets but giant fire extinguishers, or to put it in the language of nomads, clumps of reeds and cornstalks bound in sheaves. The most notable of these are at Rayy (12th century34) (PLATE 113), Varamin (1289), and
Bistam (1313) (the latter built by the architect Muhammad ibn al-Husain), with 21, 32, and 30 flanges respectively, and Radkan East (c. 1281) with a bundle of 36 reeds (Figure 48). The prototype of this last is the Dzhar-kurgane minaret (1108–09) with its reeded form executed in mosaic brickwork and linked at the top by squinches.\(^{34}\) The Minare Kishmar (c. 1300) built by the architect Mirza is a combination type with alternating flanges and reeds engaged to the exterior, and there is an interior dome carried on eight piers surrounded by an octagonal ambulatory. In northeastern Iran tomb-towers are of a somewhat different type. They consist of tall octagonal chambers roofed by polyhedral tent domes. Among them are the Mausoleum of Yusuf (1162) and of Mumina Khatun (1186) at Nakhchivan, and the Gunbad-i-Kabud or Blue Dome (1196) at Maragha, erroneously thought to be that of the mother of Hulagu Khan. The latter, built by the architect Ahmad Muhammad, has its exterior walls panelled with engaged arches and punctuated with angle shafts (Plate 114). The surfaces are agitated with raised intersecting glazed or unglazed terracotta strips. These brick mausolea are invariably built over masonry basements of varying heights, which are not always below ground level. The same holds true of those with square chambers such as the Gunbad-i-Surkh (1147) (the Red Tomb) built by Muhammad ibn Bandan with its wonderfully pleated angle shafts (Plate 115), and the Round Tower or Se Gunbad (1167), all of which are at Maragha. Despite the cylindrical shape of the exterior at the latter, the inner chamber has a square plan, and the entrance is contained within flat frames that do not follow the curved plane of the walls.

The flanged tower motif was disseminated eastward as was natural since Mahmud had conquered Gurgan.\(^{35}\) Of the two Minars of this type at Ghazni the earlier was built by Masud III between 1098–9 and 1114–15, and the latter by Bahramshah (1117–8, 1148–9). A shaft of stellate plan was set over an octagonal socle, and, as is evident from drawings by early travellers, this was surmounted by a cylindrical stage of roughly the same height, which has since fallen. The earlier surviving shaft is ornamented with square and oblong panels filled with raised terracotta bonds and inscriptions (Plate 116). The flanged tower then ventured to Delhi with still more substantial modifications. In Iran generally minarets were of a cylindrical shape either with a slight or noticeable taper. They rose on square or octagonal plinths, had as many as three diminishing stages, and for the most part were unbroken by windows. They stood at or in close proximity to the north corner of mosques, were of great height, and carried their
galleries on flared cavettoes or on mukarnas corbels. The curved surfaces were covered with brick bonds constituting herringbones, frets, keys, channels, rhombus, and other mosaic patterns, as well as glazed or unglazed collars of inscription. The Manar of Barsian (1098) was probably appropriated to the service of a later mosque. This is suggested by the fact that it passes uncomfortably close to the dome, and is incongruously stationed behind the mihrab of 1134. We list below a number of the Iranian and Transoxanian minarets in approximate chronological order: Termes (1032), Sangbast (first half of 11th century), Damghan-minarets of the Tarik Khana and of the Masjid-i-Jami (c. 1058), Sawa—Masjid-i-Maidan (1060), Kashan—Masjid-i-Jami (1073), Uzgan (second half of 11th Century), Termes—Mar Yaqub, and Kirat (both late 11th century), Isfahan—Chihil Dukhtaran (1108), Dowlatabad (1108—9), Sawa—Masjid-i-Jami (1110), Husrawird (1111—12), Gar (1121), Sin (1132), Bistam (first half of 12th century), Isfahan—Ali and Sareban (both second quarter of 12th century) (Plate 117), Bokhara—Kalyan Mosque (1101, 1131), etc.... This type of brick minaret also found its way to Mesopotamia, where a particularly fine example is at the Jami-al-Kabir of Mosul (1148). It is bonded from socle to summit with a network of sunk or raised concentric stepped lozenges, diagonally curved chevrons, and intersecting tangent circles in various combinations, while the compartments which contain them are marked off by cable borders, diamonds, and interlaces (Plate 118). A yet more elaborately ornamented minaret adorned over its full length of about 200 feet have come to light only in 1957 at Jham off the beaten track in Afghanistan, on the site of what is believed to have been the capital of the Ghurid kings at Firozkoh destroyed by the Mongols in 1222—3. A bold band of blue-glazed inscription names the Sultan Ghiasuddin (1163—1202), 'companion of the Emir of the Faithful', 'glorifier of Islam', whose brother's name is found on the Kutub Minar in Delhi, the first stage of which was erected by their general Kutubuddin. Fortunately, all the three tapering and successively shortened cylindrical stages at Jham are preserved and surmounting the last is a colonnaded drum presumably once supporting a cupola. There is apparently a double spiral staircase wound round a central newel, a considerable feat of construction considering the restriction of space. Along the shaft of the first stage numerous star-shaped, hexagonal, circular, and oblong compartments containing complicated geometric arabesques are carved in terracotta relief which are in turn enclosed by a zig-zagging band of Kufic inscription spelling out the 19th Sura of the Quran, 'The Chapter of Mary'.

Architectural tradition in Iran cannot be divided into water-tight compartments based on dynasties. There were no doubt preferences of type and style, but there was also a continuing activity that freely drew on the devices of the past. Thus the Seljuks were quick to adopt the trilobed mukarnas squinch which had appeared in the Duwazda Imam (a tomb chamber commemorating the 12th Imam) at Yazd (1037) before their arrival in Iran. Such squinches have now also been found in Uzbekistan at the Mausoleum Arab Ata (c. 977). What little remains of the entrance façade of the caravanserai known as Rabat-i-Malik (1078), north-east of Bokhara, built by Shamsul Mulk, testifies to the robust taste of Transoxiana architects. But the rhythmic succession of semi-cylinders composing the exterior wall and giving it an illusion of depth and power was an old standard method of construction in Transoxiana and even the linking sequence of squinches above the cylinders appears to have been anticipated. In these instances the walls were built on a talus and the entrance elevated above the surrounding terrain.

The most significant Seljuk work that survives in Iran is the Masjid-i-Jami at Isfahan. This mosque was initially built by the Arab conquerors in the First Century of the Hijra, and then rebuilt in 840—41 and enlarged in 908—32. On Tughril Beg's investment of the city in 1050 the Mosque was destroyed by the inhabitants for procuring wood according to Nasir-i-Khusrau, but as this same writer calls it a 'superb mosque' in 1052, it seems that the Seljuk conqueror had rebuilt it. The large quantity of wood used in its construction suggests the use of a timber ceiling. The Jami of Nishapur as built by Amr ibn Layth, c. 895, appears to have had a timber ceiling, for it was described as having
a sloping roof with painted and gilt carvings and arabesques.⁴⁰ In the Isfahan Mosque an inscription in the collar of the large dome over the mihrab (PLATE 119) states that it was built for Malik Shah by order of the Prime Minister (Nizam-ul-Mulk, c. 1085). From the analogy of later Seljuk mosques (Ardistan and Gulpaigan), it would seem that this domed chamber was preceded by an iwan, though the present structure with its mukarnas and faience is of course much later (PLATE 120). This disposition of an iwan leading to a domed chamber originates in palace architecture, and one example of it was al-Mansur’s Palace (762–66) in the centre of the Round City of Baghdad as described by al-Khatib.⁴¹ The piers of the court façade at Isfahan were also different in Seljuk times as became evident when a pillar of oblong plan with rounded edges was disinterred from later masonry. As for the iwan on the sanctuary side we have an interesting example of it at Nizir. One scholar believes that it belongs to the category of a mosque-kiosk in which the domed chamber, or here an iwan, was the central portion later dignified into a congregational mosque by the addition of an arcaded court. This view has been opposed by another scholar who contends that this iwan was not erected in 951 and then extended, but that in 1164–5 the Seljuks inserted it in a pre-existing mosque, as in fact they had inserted elsewhere—in Isfahan (1088), in Mayyafarikin (1166, with the present wing dated 1227 as inscribed on a mihrab), in Barsian (1134), and in Ardistan (1158). If this view is accepted then we must conclude that the building of a domed maqbara for the Sultan was the contribution of the Seljuks to Iranian mosque architecture.⁴²

How the individual bays of the prayer hall were vaulted at Isfahan in the Seljuk period is not definitely known, but it is plausible that a number of the still surviving vaults, especially the ribbed ones of more robust section, were built after the fire caused by the Isma'ilis in 1121. I believe that the broken-headed arches here (PLATE 121) are a clue of the date since such arches are first used in 1116, in the Seljuk court façade of the Great Mosque of Diyarbekir.⁴³ It is a mistake to regard the Isfahan ribs as merely decorative in contrast to the Armenian ones; that they are constructional is evident from the fact that in cases where the brick infillings have fallen the ribs themselves (even the thin ones) have survived—they serve in other words as armatures in which the interstices have been pinned. As Armenia had succumbed to Alp Arslan in 1064, following which Nizam-ul-Mulk had married the Armenian king’s daughter, we cannot rule out the possibility of some architectural liaison with Isfahan. An Armenian precedence has been urged by some scholars,⁴⁴ but in resolving this issue two factors must be borne in mind; the first that Moorish ribbed vaults long antedate any others and the Isfahan ones may have come from the Maghreb, and second that the chronology of the Armenian examples has not been conclusively established.⁴⁵ At some instances in the latter, moreover, there are characteristically Muslim features present, as witness the mukarnas capitals in the porch added to the Church of the Holy Apostles at Ani, and the mukarnas dome at Horomos.⁴⁶ In fact Muslim influence entered Armenia as early as 989–1001 when the architect Trdat introduced pointed arches and clustered piers at the Cathedral of Ani as also at Arates,⁴⁷ that is long before the Mosque that was built and which survives in a fair state in Ani (1073).⁴⁸

Apart from the variety of the ribbed vaults (some with an oculus) at the Isfahan Jami (PLATE 122), there are mukarnas ones in the oldest part of the south oratory (PLATE 123), and above the plaster covered cylindrical brick piers it is a joy to follow the gradient sweeps of brick as they delineate the arches, squinches, groins, and armatures of rib. Elsewhere in Iran ribs were seldom employed in oratory vaults.

The barrel vault on the sanctuary side of the Isfahan Jami has since been prefaced by a pishtaq or framed frontispiece, and, in order to provide a gradual transition to the domed chamber a half dome has been backed against the portal.⁴⁹ The roots of the half dome on squinches lay back in the grand hall of the Sassanian palace at Sarvistan (early 5th century), the cross vaulted halls of Qasr Kharana (710 or earlier), the Ukhaidar Mosque (c. 750), and in the gateway leading onto the lofted terrace of the Palace at Samarra (836). It had been employed by the Seljuks in Syria in the Tomb of Safwat-ul-Mulk (1110) at Damascus,⁵⁰ and
previous to this in the lavish portal of the Jurjir Mosque of the Buyid period c. 1000. In the above instances the mediation between the flat backed base and half dome head of the portal is accomplished rather ineffectively by means of simple hood-niches, whereas in the iwan at Isfahan there are four tiers of large niches. The earliest mukarnas portal in Islamic architecture dates from the late 12th century in Syria, but the earliest Transoxianan example known to me is in the Mosque of Magok-i-Attari at Bokhara of the 13th century where a mukarnas squinch of three registers mediates between the half dome and the rectangular base of the portal.

Each of the four portal half domes in the four ivans at Isfahan being quite different in design, we can safely assume that they date at different times, (FIGURE 49). However it seems likely that four ivans
were employed in the Masjid-i-Jami of Isfahan by 1121. The four-ivan plan originates in domestic architecture. The scheme of two ivans confronted across an open court was first introduced in Parthian times, and the example at Kuh-i Khavaja has been attributed to the 1st century AD. The Parthian palace excavated at Seleucia (AD 120–200) similarly had two ivans opening north and south of the court. This was adopted by the Sassanians at Ardashir I’s Palace at Firuzabad (c. 250 AD). Another Parthian palace excavated at Ashur (1st century AD) seems to have had three or even four ivans in the typical Islamic style. In Muslim architecture the earliest dated example of four ivans is the palace excavated behind the mihrab of the Abu Dulaf Mosque at Samarra (859–61). After this we must list the cruciform houses at Bamiyan and at Rayy, and Nizam-ul-Mulk’s edifice at Khargird (before 1092) and the Ghaznavid Palace at Lashkari Bazaar (c. 1020) which I have already described. The cruciform plan was fully naturalized in the 12th century in all sorts of structures when it was introduced in the inner courtyard of Ribat Sharaf (1114) and in the Mosque at Zawara (1135). Since the cruciform passed westward through such examples as the Hospital of Nuraddin at Damascus (1154) its appearance in the Cairo Madrasas may be regarded as excessively late.

Be this as it may, in Isfahan we have the full and final development of the mosque plan. In a sense one might say it is even overdeveloped, for in 1088 Taj-ul-Mulk, a rival of the illustrious Nizam, built a domed chamber north-east of the Mosque which was later incorporated into it by the extension of galleries. If it were built in rivalry, as it has been suggested, it would scarcely have been smaller in size, though it must be admitted that the shape of the dome is certainly more compact and sensuous, and its transition more accomplished (PLATE 124). In this so-called Gunbad-i-Khakhi there is an octagonal as well as a hexadecagonal drum, both of which have their equivalent in the interior (PLATE 125). In Nizam’s dome there is a lack of continuity between the squinch area and the supports which consist of junctioned cylinder piers of quatrefoil plan with flat abaci in place of capitals. There is also a mean timidity between the piers. In the small domed chamber on the other hand, the load-bearing arch is satisfactorily related to the blind framing arch, and the flabby pier roll is broken up into angle colonnettes alternating with pilaster strips. One pair of these punctuates the arch flanks, another pair carries past and rises as far as the cornice and provides a visual foothold for the squinch niche which descends at that point. This continuity enables the squinch to appear as if it impregnates the whole chamber from the ground right up to the base of the dome. Within the trilobed outline are the mukarnas niches and quarter domes. Not content to let the circular rim of the dome settle on the octagon, another interposed range of squinches with slightly concave backs are employed to attain a sixteen-sided figure, over which the dome-base fits with scarcely a ripple of displacement.

Attaining such perfection in the construction of transition devices did not mean the end of experiment and repetition of the same formula elsewhere. The Masjid-i-Jami at Qazvin (1113) had a simple groined squinch niche, and the Mosque of Gulpaigan (1105–17) had squinches consisting of four registers of mukarnas cells. At Ribat Sharaf (1114, restored 1154), a fortified caravanserai between Meshad and Sarakhs, the uppermost lobe of the trilobed squinch has been compressed into a gaping orifice, and another is composed of a stepped triangle of oversailing bricks.

Seljuk dome shapes tend to vary: that of Gulpaigan has a steep flat ascent, and its surface is veined by a thin gore of ribs. It is preceded neither by a pishtaq screen nor by a barrel vault as these have presumably collapsed leaving a clear view of the high drum. Each transition device is expressed on the exterior as a half pyramid. This is the case also at the Masjid-i-Jami at Ardistan, where the dome has a pointed apex and the contours are crisp. The latter was rebuilt in 1158–60 under Abu Tahir by the Isfahan architect Mahmud ibn Muhammad. He now designed it in the four-ivan form, and placed barrel vaults to take the thrust of the qibla iwan. This iwan is attractively stuccoed with scimitar-sharp inscriptions and
bifurcating palmettes (Plate 126). Mortar joints in the dome chamber are emphasized to form stepped lozenges and diagonals.

Flowing over the brick walls of the sanctuary at Qazvin is a stucco inscription band that trifoliate as it rises and meanders into pouched loops as it falls (Plate 127). A decorative trifoliate range without the under loops occurs on the walls of a Buddhist cave at Bamiyan. At Qazvin each of the exposed bricks is separated from the next by a header plugs decorated with interconnected stucco weaves, a diaper device that imparted a gem-like scintillation to the surface. At Ribat Sharaf where this feature once again appears, the bricks are plastered over, and then incised to simulate brick oblongs. Simulated brickwork over plaster is first encountered in the mausoleum at Sangbast attributed to the Ghaznavid governor Arslan Jadib (early 11th century) in the curved plane of the archivolt enclosing the squinch (Plate 128), and it could be that the technique was invented to circumvent the use of curved bricks. Once established, it became an acceptable form of practice to deliberately disguise the brickwork and then imitate it in plaster.

It used to be thought that hazarbafl or brick mosaic was largely confined to minarets and to interior surfaces in Iran until the recent discovery of the two octagonal mausolea at Kharrazaq northeast of Hamadan dated 1067-8 and 1093. Apart from their splendid and accomplished brickwork, there are within paintings of birds and hanging lamps, and the domes are the earliest instances of double domes. Rich examples of mosaic brick on exteriors are found in Transoxiana. In the so-called Mazar Alamberdar, situated 10 miles north of Kerki, they are contained in the tympani of blind arches (as at Ukhaidar) while the octagonal drum, the circular drum above it, and the dome of 10 metres internal diameter, are all of plain brick.

Closely akin in style of brickwork is the superb Talhatan Baba Mosque in the Merv Oasis with its triple arched entrance façade, and rear wall decorated with blind arches on engaged columns of brick. In South Turkemenia the surface of the bricks themselves are often carved in relief with patterns such as pointed crosses, knots, pearls, horseshoes, zigzags, etc.

The Seljuks were weakened by the invasion of the Ghuzz Turks, and their empire was further reduced by the Khwarizm Shahs. The latter established an impressive capital at Kunya Urgench, which was flooded and destroyed by the Mongols in 1221 like so many other cities. The Mausoleum of Sultan Tekesh (d. 1200) however survives—a unique combination of kubba and tomb tower, whose flanged drum is surmounted by a cone clad with blue glazed brick mosaic.

In exact contradistinction with Anatolia, Iran is almost totally devoid of buildings dating from the 13th century. Reference has been made to one or two tomb-towers of this period, and to this should be added the numerous mihrabs painted in gold glaze probably made at Kashan between 1226 and 1333, and now scattered in various museums together with the star and cross lustre tiles used as dado and sarcophagus revetments, the earliest of which appear to be those in the Tomb Chamber of the shrine of Imam Reza at Mashad, dating from 1215. A slow beginning was made after 1250 when Hulagu became a subsidiary to the great Khan at Pekin taking the title of Il-Khan, and built his astronomical observatory at Maragha with slit dome and library annex (c. 1258). Inside were representations of the celestial spheres, epicycles and deferents, phases of the moon, and signs of the zodiac.

The Mongols rapidly acclimatized themselves to the Persian style of building: thus we hear of Ogudai (1229-45) building a Persian palace for himself at Kerchagan, a day's ride from Karakorum. Carpine (711-13) claimed that the Mongols employed the best Saracen craftsmen. On the other hand a city called Tun in Kuhistan (120 miles south of Nishapur) had been built originally on the plan of a Chinese town according to Mustawfi. Ghazan Khan renounced Buddhism and adopted Islam together with 10,000 Mongols in 1295. When the iconoclastic zeal of the convert had worn off, he put by his vandalism and became a veritable champion of progress. His zeal was such that he decreed a bath and mosque to be built in every town throughout the land. (Once he had built Buddhist temples at Kabushan.)

Ghazan's complex of buildings in a suburb to the west of Tabriz was begun in 1297, and included
a monastery, hospital, observatory, library, palace, and religious schools. Most conspicuous was his own twelve-sided mausoleum, in which the monarch himself was consulted about the position of the window in the crypt. The twelve sides were adorned with the twelve signs of the zodiac in carved relief, and in size it is known to have rivalled the mausoleum of Sultan Sanjar at Merv, for its dimensions were furnished by the historian Wassaf. It is notable that Ghazan began his mausoleum (in 1299) five years before he died in 1304. The collegiate garden-city of his minister Rashiduddin was also a stupendous undertaking; it was here that the latter compiled the celebrated Universal History between 1306–10, of which many copies were transcribed, some containing illuminations heradling the introduction of many Chinese motifs in Islamic miniature painting. But apart from fragments of glazed tile to be picked up on the site, and the crumbling remains of a gigantic tower faced with ashlar blocks at the base, no vestige survives of the buildings mentioned by Rashidaddin in a letter to his son.

At any rate, the little that remains of the Mosque of the Prime Minister Ali Shah (c. 1315) at Tabriz conveys some slight notion of the cyclopean scale on which these pacified Mongols could build. The lateral walls of the iwan are more than 30 feet thick, and the exterior junction with the sanctuary wall, whose mihrab is flanked by arched windows and emphasized by a bastioned tower, describes smooth curves in brick. The vault, which has since fallen, once straddled nearly a 100-foot width, sprang from a height of about 80 feet and was about 160 feet in depth. Hamadallah Mustawfi says in 1340 that this hall which was even greater than the Palace of Ctesiphon fell because it was built in too great haste. Ibn Battuta tells us that the Sultan Abu Ishaq (d. 1356) determined to build a vaulted palace in Shiraz like the Aywan Kisra, and that this work which was then 30 cubits high was being superintended by a son of the substitute of Ali Shah. He also reports that Ali Shah's Mosque was paved with marble and its walls faced with qashani (glazed tiles). The great iwan at Tabriz is known to have been attached to a court with columned arcades. This contained an enormous pool with a central platform supporting playing jets, and four lion gargoyles spouting water in all four directions.

Coming now to the progress of funerary monuments we must recall that in the Mausoleum of the Samanid rulers was a high gallery at squinch level circumscribing the chamber and opening outside by means of a band of link-framed window arcades. Similarly the mausoleum outside the
medieval city of Sarakhs, presumed to be that of Abul Fadl a Persian mystic who died in 1023, has a high circumscribing gallery. It is lighted by slit windows and reached by two stairs. The exterior walls are treated with blind arches and pilasters, and the dome is 10 metres in diameter.\(^7\) The huge Seljuk mausoleum of Sultan Sanjar at Merv (1157) built by the architect Muhammad ibn Atsiz has a tall cylindrical drum that is almost equal to the height of the chamber wall, and three ranges of (ruined) arcades are situated around it at receding levels. The lower wall mass has been left bare as if to emphasize its great bulk. The profile of the dome is stepped thrice so that the crown is comparatively light, and this broken profile of the dome-extrados was once disguised by the thin membrane of a second outer dome. Within the interior of the inner dome are ribs branching and intersecting and rising in groups of four (FIGURE 50).

The true successor of the Merv tomb was the Mausoleum of the Mongol ruler Uljeitu at Sultanis, built between 1307 and 1313, during which time the ruler became a Shi'ah in his beliefs and hoped to augment the sanctity of his memorial by bringing there the remains of Ali and Husein from Iraq—a scheme which was not fulfilled because of his return to the orthodox faith before his death. The dome, which arises amid a huddle of hovels (once it was the capital of the land), has the shape of a tense pointed helmet with a diameter of nearly 80 feet and an apex reaching a height of 165 feet above the ground. The flaking surface of this dome revealed that the thickness of the inner dome is progressively reduced in steps and that this impaired contour is cloaked beneath the thin diaphragm of the outer dome. Cells of brick grid the two together. Such a dome cannot be termed double in the true sense of the word since the outer shell serves only to disguise the lightened crown of the true dome. Each of the eight corners of the octagonal terrace is weighted with a minaret of which, today, ugly stubs remain. A single minaret in connection with a tomb would be unusual, but eight of them are quite exceptional. Two-storeyed arcades exactly equal in height surround the interior (FIGURE 51). But if the intention has been to economize materials, reduce the load of over 20-feet thick walls and concentrate it at limited points of support, that intention has been well achieved. (The deep arched voids in the interior walls of the octagonal domed Mausoleum known as Chelebi Oglu (c. 1330), in the near vicinity, which is built over a vaulted masonry crypt, are a manifestation of the same intention.)

The upper arcade of the Tomb of Uljeitu is treated as a pseudo gallery opening only onto the interior, but above this is a true gallery which only opens onto the exterior. The latter is now difficult of access due to the collapse of intra-mural stairs. This gallery is roofed by vaults that rise over independent bays, either on single or double glaci pendentes; where single, they form a lozenge-shaped compartment overhead, outlined by a decorative border in relief (PLATE 129), and where double they form a star-shaped compartment containing a multiple-groined parasol vault. Iran's finest decorative paintings are preserved on these surfaces in maroon, ochre and green, with designs.
ambassador Contarini had seen three beautiful bronze doors at the mausoleum in 1474–5 which were higher than those at St. Mark’s in Venice, and were ‘worked with knobs made in damask work with silver’. 

The exterior of the building was revetted with blue faience of which remains can be seen on the dome, minarets, mukarnas cornice, and arch spandrels. On the base of the dome the glazed bricks are set in a bond, not forming the usual geometric patterns, but Kufic lettering spelling the name of Allah. Similarly, the mausoleum in the town of Barda (1322) in Azerbaijan is revetted with the name of Allah in brick in an oblique mesh, and the Karabaglar Mausoleum at Nakhchivan (first half of the 14th century) has Kufic glazed brick on its 12-lobed exterior. 

Already by 1340 in the Rabenou mihrab, originally from the Madrasa Imami at Isfahan and now in the Metropolitan Museum in New York, faience mosaic was at the height of its splendour. Whereas earlier designs had been purely geometrical, here geometricized foliage begins to make its appearance and the range of colours is widened to include russet brown and green.

We have once again to attribute the finest stucco work of Iran to Ilkhanid patronage. The Uljeitu mihrab (1310) at the Masjid-i-Jami at Isfahan demonstrates how separate ensembles can co-exist one on top of the other without resulting in hopeless confusion. In the tympanum, inscriptions weave adroitly through the foliage while in the rectangular border frame, they float unkeyed on a ground of foliate scrolls. These tendril rings subscribe a vortex motion to the composition, and the superposing of separate decorative systems results in a sort of spatial counterpoint. 

Where, however, spatial depth is sought merely by thickening the crusts of plaster the result has been, as in the Tomb of Pir-i-Bakran at Linjan southwest of Isfahan, a huddle of twisted and ill-sorted forms. This building with its tunnel-vaulted iwan flanked by three-storeyed buttressing walls was probably a meeting hall for initiates of the saint who died in 1303, and after whom the building was named. The building was converted into his
mausoleum in 1313, by placing his grave at the head of the iwan, which was then partitioned by a decorative screen, and the mihrab was set into a low wall built across the open end contrary to all precedent. The plaster-work here is not a little reminiscent of that in the sanctuary wall of the Gunbad-i-Alawiyan at Hamadan, where it occurs in almost suffocating profusion, particularly on the multiple angle colonnettes with vase capitals which are perforated to resemble parterres of white daisies in close array. While the plaster revetment may well date from about 1315, the chamber with its fallen dome has one feature in common with earlier buildings: the four angles are buttressed with tower flanges star-shaped in plan (figure 53). Thus the corner towers of the Sultan Han caravanserai between Kayseri and Siwas (1230–36) have such flanged towers rising on octagonal socles, while the engaged salients of the portal of the Divrik Hospital (1228) also in Anatolia, are of substantially the same order. This would confirm the supposition that the mausoleum at Hamadan (whose vaulted crypt is a place of pilgrimage for barren women), was a pre-Mongol one dating from the time of the prosperous and eminent Alawi family (c. 1200–500).

Although the palaces and astronomical observatory of the Il-Khan rulers do not survive, some religious structures do. The irregular plan layout of the monastery or Khanqah at Natanz indicates that the shrine complex grew up over a number of years and was aligned along pre-existing streets. Moreover, the disappearance of earlier buildings had left the surviving ones as a random conglomerate. The dated buildings include a four-ivan mosque with two-storeyed arcades (1304–9), a portal with elaborately decorated terracotta bonds in relief and panels of faience insets (1316–7), and a cylindrical minaret (1325). Another contemporary shrine complex of this character is that of Bayazid at Bistam (1299, 1313), but it is in the Masjid-i-Jami (1302, 1306) of this town that an interesting minor variant of the broken-headed arch appears formed like a Chinese pagoda roof by its maker Husain ibn Abu Talib of Damghan. One notable building in the Natanz complex is the Tomb of Shaikh Abd as-Samad (1307), which is covered by a mukarnas cupola coated with whitewashed plaster. The stepped ground plan of this mausoleum complicates the corbelling of cell which have to spring over grilled windows on corner squinches. An eight-sided tent dome appears on the exterior over the chamber, and it may be that the outer dome helps suspend the inner one in just the reverse fashion to the tomb tower at Radkan, where triangular braces transfer part of the load from the cone onto the false inner dome which, however, has since fallen and uncovered the device.

Such fallen constructions are a blessing from this point of view for they often enable us to envisage the hidden devices at work: The entrance to the Masjid-i-Jami at Varamin (1322–6) built in the reign of Abu Said has a flaking mukarnas half-dome whose corbelled shell is now seen to be wedged to structural half-dome by means of embedded horizontal beams. Later, ropes and hanging strips of wood were also used to hold up the decorative mukarnas vaulting. The falling of one whole side of the groin-vaulted bays of the court has likewise been a fortunate though fortuitous event at Varamin, for it gives us a cross section enabling us to appreciate its graded composition (plate 130). The exterior of the dome over the mihrab is progressively stepped so as to lighten the crown, but there is no indication that a
diaphragm shell once concealed this irregularity. The domed chamber at Varamin is converted to an octagon by means of mukarnas squinches contained within frames, and the octagon once more converted into a sixteen-sided zone by means of eight groined devices alternating with eight windows (windows in Seljuk domes were rare). The canopy of the dome is conceived as a vast petalled flower made up of radiating intersecting bricks that form an ever enlarging grid of lozenges as the base of the dome is reached, and within these lozenge compartments are plaques of Kufic phrases and these too enlarge as they descend, enhancing the sensation of the dome receding into the sky itself.

Abu Said (1317–25) was the last of the Mongol rulers of any note, but his penchant to carouse and display his pomp led to his neglecting state affairs, and under the care of his minister the decentralization of Iran began all over again. The Muzaffarids, who gained ascendance in the Eastern parts, are notable for having erected large halls covered with transverse vaults, for example, a pair of oratories flank the dome chamber at the Masjid-i-Jami of Yazd (Plate 131); which were erected in 1362 by Amir Ruknad Din Shah Hassan. The one on the east has lantern penetrations on squinches in the middle of the transverse vaults (domestic houses of Yazd incidentally are conspicuous for their badgir or air-shafts in the ceiling opening outside in attractive wind-catching inlet heads) with further fenestration in the side walls, and in the west hall groin vaults instead of lanterns interrupt the transverse barrel vaults. In the similar structure the Khan Orta (1356) at Baghdad, the transverse vault is stepped twice, and each time the end wall is pierced with windows. In the middle again there are eight-sided domes on squinches. This warehouse-market has ground floor shops, and a second storey of independent rooms also opening into the central hall but served by a continuous corridor.

The most ornately decorated monuments of this time survive not so much in Iran as in Turan, particularly in the many domed mausolea in the Shah Zinda (The Living King) cemetery in Samarcand of which the two most splendid are the Tomb of Bayan Kuli Khan (1358) and Shujuk Bika (1371).

In the 15th century it was Turan’s turn to dominate the scene both politically and artistically under the Timurids. For this it had to thank the Mongolid-Turk Tamerlane who after the guiles and near-escapes of his exciting youth, enlisted the tribes of Transoxiana in another bid for world conquest. All the land in a great triangle from Moscow and Damascus to Delhi fell into his clutches, and once more the tales of terror and tyranny were repeated, and once more the cities tumbled and all was left ‘roofless, desolate and bare’. Ibn Khaldun condemned the ‘absolutely lastarily deed’ of his troops when they turned the Mosque of Damascus into a shambles. It was one of Timur’s malicious practices to tear down the monuments of his predecessors when he found it hopeless to rival them, and another was to decapitate his architects if they could not comply with his extravagant wishes. A miniature painting represents either Timur or one of his overseers lashing out at a terrified labourer. The Spanish ambassador Clavijo (1403–6) testifies that Timur found the tomb of his son in Samarcand too low, ordered it to be demolished, and gave the workmen an ultimatum of ten days to re-erect it, which they miraculously did by working night and day. On the other hand, Timur’s own palace at his native town of Kesh was, according to the same acute observer, still incomplete after 20 years work on it. Clavijo believed it had been started by a previous Sultan since the figure of the Lion and the Sun over the entrance and over the crown of each arch in the façade, was as he knew, not the armorial bearing of Timur. He describes a reception hall of square plan with upstairs apartments and galleries—‘so marvellously wrought that even the craftsmen of Paris who are so noted for their skill, would hold that which is done here to be of very fine workmanship’. He also describes one of Timur’s garden pavilions in the suburb of Samarcand as cross-shaped in plan with an arched alcove in each of the arms and a raised dais for sleeping on, while his detailed description of the furnishings is unparalleled and of considerable value in picturing the lavish surroundings amid which Muslim potentates lived. Babar says that in Timur’s Bagh-i-Dilkusha (Heart Delighting Garden), in the eastern suburb of
Samarcand, the kiosk was painted inside with pictures of his battles in Hindustan. According to Sherafaddin Ali Yazdi the Friday Mosque that Timur had built near the Iron Gate in Samarcand with its 480 pillars of hewn stone each 7 cubits high necessitated his having stone cutters brought from Azerbaijan, Fars, and India, while his Bagh-i-Shimal at Samarcand was built by workmen from Syria and Baghdad who excelled in mosaic work and in the constructions of fountains and jets. None of these buildings survives so that we are fortunate in having even a cursory description of them.

Timur's tomb, the Gur-i-Mir, at Samarcand was built c. 1405 and completed by an Isfahan architect in 1434, when an entrance façade flanked by minarets was added. The mausoleum consists of a square chamber expressed on the exterior as an octagon with entrance openings on four of its sides. These entrances widen into bays before entering the domed chamber, thus emphasizing the cruciform arms of the interior plan. Eight commemorative slabs inscribed with the names of Timur, his sons, ministers, and saints, are in the centre of the chamber, while their remains are in a vaulted crypt below. A greenish jasper band above the alabaster dado has a gilt inscription telling the deeds of Timur. Above this a new medium of decoration appears, for blue and gilt patterns are formed in relief by means of pressed paper. The octagon then becomes a steep cylinder, or, if you will, a bared neck ready for the scimitar. On the exterior surface of this drum runs a vertically articulated mauve inscription in glazed bricks. The skull of the ovoid and slightly bulbous melon dome*4 is chequered with square and oblong blue glazed bricks forming lozenge grids. The internal dome which serves as a ceiling for the chamber is at least 30 feet lower than the dome that appears on the outside (Figure 54). These two are welded together by a set of radiating spokes geared upon a hub of masonry, and by this means they have succeeded in resisting the most devastating earthquake shocks. Both the slightly swollen shape of the dome and the system of internal trestle supporting a second dome were probably derived from Damascus, since it is definitely known that workmen had just then been imported from there. In 1184 Ibn Jubayr had described Malik Shah's dome built in 1082 on the Great Mosque of Damascus as a sphere within a large sphere with its 48 ribs curving over it and meeting at the summit in a circle of wood. But the view that the double dome itself was imported by Timur is untenable, since it is clear that the Mausoleum of Sultan Sanjar, c. 1157, had a double dome*8 just as did the two Seljuk mausolea discovered in 1965 in Kharraqan; another 12th century Seljuk double dome was over the mausoleum of Abu Said at Meheh,*9 while on stylistic grounds a number of undated buildings with double domes are assigned to the Mongol period in the 14th century (these include the tomb shrine at Ziaret, the Haruniya at Tus, and the three mosques situated S.E. of Isfahan.

*4. **Figure 54** Samarcand, Gur-i-Mir, cross section (Rumpler)
at Dashti, Kaj, and Eziran). In these cases there is apparently no system of internal trestles nor a great space between the outer and inner domes. At any rate the permanent adoption of the double dome in the Timurid period, the suppression of the squinch on the exterior, and the omission of the masking gallery resulted in a high drum which became a characteristic of Iranian architecture from this time on.

With Shah Rukh (1404–1447) the centre of the Timurid Empire shifted to Herat and Meshad. His wife Gawar Shad’s Madrasa at Herat was built between 1417–37 by the architect Qiwanuddin (as stated by an inscription in the local Museum). The isolated minaret which survives in the Bagh-i-Sabz may have belonged to this madrasa, but the four minarets nearby which mark the corners of a building of which now not a trace remains, are claimed to belong to the Madrasa of Sultan Husain Baikara (1487–1506). These slightly tapering cylindrical minarets are preserved to a height of over 120 feet, and it is apparent that they were completely sheathed in gleaming cobalt blue mosaic tiles within a white band forming a net of lozenges and stars. Inside the Mausoleum of the Timurid Rulers at Herat, popularly called the Gunbad-i-Sabz, there were once six tombstones of black marble. Of these the earliest was that of Baisunghur (d. 1433), and there was also one of Gawar Shad (d. 1456). The exterior of the dome is reeded like that of Timur, but the interior is a complex tour de force of construction (Plate 132). The interior ground plan is again a stepped square with entrance openings on three sides, but with a pentagonal apse terminating the fourth. There are apparently three layers of dome. The internal one covers only a part of the chamber, and is therefore supported on arches thrown up from quarter domes rising over the corners of the chamber. The intervening zones between the cupola and the entrance bays are made up of half domes flanked by quarter domes, fused to the walls by means of clustered cells, whilst the entrance bays are themselves crowned by small domes flanked by half domes. All these surfaces are coated with plaster painted with polychrome designs.

Timurid art was primarily an art of colour. Without it even the Masjed-i-Gawar Shad at Meshad (1405–19) would fail to impress and all the separate sections of polychrome tile would begin to clamour all at once and demand equal attention. The whites would be so stark that they would seem to advance out of the surface and to impinge on the quiet modulations of their surrounds: the eye would soon tire of following the staggered blurrings of brick, and the jig-saw counter of tile; it would become impatient with the vermicelli choppance of Naskhy; it would deplore the coiling vine stems in the spandrels, as it does the massive flurry of white-washed stalactites at the dead-end of the main iwan which towers like a vaulted crevasse. But cast away the photographs, venture into the court, and you are engulfed in an ocean of colour of which the impression that remains in the mind is of a rusted blueberry cream made up of blues tinted with white, in places over a ground of biscuit brick. These tiles have been cut into fragments of every shape and size, and joined again so unerringly that each pattern seems composed of a single piece.

As for the proportions of the ensemble, designed by Qiwanuddin (d. 1438), an architect of Shiraz (who also built the Khargird Madrasa and in his capacity as an astronomer composed a new calendar), Meshad was definitely a step back from Varamin. The three ivans are scarcely subservient to the fourth; the frame of the main iwan cuts off a view of the turquoise dome with its white finial spelling Allah’s name; and finally the minarets which flank the portal are made to grow from the ground so that they spend their force by the time they have cleared the portal head. After the Madrasa of Bibi Khanum (1399–1419) (a Chinese princess who was Timur’s favourite wife) at Samarqand it became a regular practice to engage the minarets to either side of the portal. The latter had eight minarets in all—two pairs flanking the entrance and sanctuary portal, and one on each side of the four corners of the outer enclosure (as at Damascus). So, too did the Madrasa of Ulugh Beg at Samarqand (1417–20) have a minaret at each of the four corners in addition to having four lofty domes and a succession of two storeys of cells each divided into two cubicles for students. In the Chihih Sutun (Forty Columns) garden palace in the suburb of Samarqand which Babar attributed to Ulugh Beg, again there were four corner towers. They gave access to the
four-doored banqueting hall, while on both floors were pillars of stone, fluted, twisted, and polygonal. 103

It was characteristic of Ulugh Beg that he would have had inscribed on his other Madrasa at Bokhara the words: 'To acquire knowledge is the duty of every Muslim', he himself had a passion for astronomy, and in the Observatory he ordered the architect Ali Kushji to build in Samarcand (1428) the task of compiling his famous astronomical tables was begun. According to Babar it had three storeys, but the only remains are part of a quadrant of large dimensions unearthed in 1908. In was cut into the hillside, and had an arc 208 feet long, the purpose being 'the larger the instrument the more accurate the observation.' 104 With it the coordinates of 1018 stars were observed and the length of the year was accurately measured. 104a We know that within the building were wall paintings portraying 'the nine heavens, the nine heavenly spheres with degrees, minutes, seconds and tenths of seconds, the skies of rotation, the seven planets, the fixed stars, the terrestrial globe divided into climates, with mountains, seas, deserts, etc...'. 105

In Iran, the Blue Mosque at Tabriz (1465) was built in the reign of the Turcoman Jehan Shah of the Qara Qoyunlu (Black Sheep) dynasty. Here the mosaic cartouches on the piers are separated by red plaster simulating brick so that the structural core seems to show through, and there are fine geometric faciaence dadoes. Like the Green Mosque at Brussa there are two principal domes—one over what may have originated as an enclosed court, and a smaller one over the mihrab, whilst the sides and front of the former are surrounded by domed aisles (figure 55); all the ruined and fallen parts have just been rebuilt with steel frame reinforcing.

But the Mausoleum of Khwaja Abu Nasr at Balkh (1416) is still a picturesque and untended ruin. Here the two-storeyed niched façades are chamfered back to form an octagonal exterior. The four portals and eight niches 'devour' up the solids of the edifice reducing all extraneous materials to a minimum. The Mausoleum of Mulla Hassan, c. 1530, at Sultaniya belongs to the same tradition, since the octagonal arcades surrounding the domed chamber consist of framed entrance ivans alternating with two-storeyed niches, through the lower of which a corridor passes permitting circumambulation (plate 133). Finally, in this sequence follows the Mausoleum of Khwaja Rabi (1617–22), north of Meshad, built by Shah Abbas for a companion of Ali who had ruled here. The exterior is once again 'swallowed' by four entrance ivans and two-storeyed blind niches in the four chamfered corners, but the masonry is still further reduced by means of paired rooms flanking each of the ivans making a total of eight. The structure with the perforated plan in which walls are reduced to a minimum culminates in the Safavid period in the Palace of Hasht Behist at Isfahan erected by Shah Sulaiman c. 1670, and redecorated by Fath Ali Shah. It too has a deep iwan in the centre of the four sides with chamfered corners forming an exterior octagon of unequal size; however, the backs of the flat-roofed ivans which are supported on timber columns are splayed so as to permit doors to be set in communication with the four dome-chambers which surrounded the central chamber. The dome of the latter with its celerestory windows is the only one of the five

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**Figure 55** Tabriz. Blue Mosque, plan (Survey of Persian Art)
which emerges on the exterior. A jet in an octagonal basin plays in the centre of this hall.

This takes us back to the prototype, the Ak Qoyunlu (White Sheep) Uzun Hassan’s Palace in Tabriz completed in 1486. Fadullah briefly describes it as an octagon surrounded by a platform (suffa) and having a niche (taq) in each side. ‘Like a turquoise throne it stands in the centre of the Sahibabad garden.’ An anonymous Italian merchant in 1507 supplements this description. He says that the palace is called Astibisti (Hasht Behist = Eight Paradises) as it has eight divisions—four corner rooms and four ante-rooms before the four entrances all enamelled and gilt. A flight of stairs leads to the upper rooms, anterooms and the dome. The height of the structure is about 90 feet, and its platform is 5 feet high and 15 feet broad. In the centre of the platform is a narrow meandering marble water channel. On the ceiling of the great hall were paintings in gold, silver, and ultramarine of battle, embassies from the Ottomans, hunting scenes on horseback with dogs and falcons, and other animals such as elephants and rhinoceroses. In this central hall of round plan with a round carpet Assambey (Hassan Bey or Uzun Hassan) used to give audience. Though there were no windows in this chamber, the hall was brilliantly lit through the full length windows in the surrounding rooms. For an approximately contemporary building serving as an audience chamber we have to go to Baku where in the 15th century Khan’s Palace is a well preserved octagonal domed pavilion of masonry. It is surrounded by an arcaded gallery raised on a platform with a crypt below, and is situated in the midst of a courtyard.106

Regarding the palace at Tabriz the Italian also refers to the Harem with a stream flowing through its central hall situated a bow-shot away, which was ‘so large that a thousand women might conveniently live there in separate rooms’. The Hospital was equally large, and even more beautifully ornamented than the Harem. The frescoes from the Palace were carried away by the Ottomans in 1558, and reset in a kiosk built on the Bosphorus especially for the purpose.107 The Tarekhana Palace at Herat also had its hall painted with scenes of battle under the order of Abu Said Mirza (crowned in 1451), and the description Babar gives of it closely resembles the palace of Uzun Hassan at Tabriz and the Mausoleum of his own son Humayun in Delhi.108

Another literary source Mirza Muhammad Haidar (1546) helps fill out the picture of architecture of this time. He describes the Transoxanian city of Yarkand. Mirza Aba Bakr (1463–97) made it his capital, and built there a citadel 30 gaz high with a very high fort (ark) inside. In the suburb were about ten gardens with lofty buildings containing about 100 rooms each. These rooms were fitted with shelves and recesses in the wall (tak and takcha bandi); they had ceilings of plasterwork, dadoes of glazed tiles (kashi) and frescoes. Along the public roads were avenues of white poplar (safidar) with water channels running by most of them.109 Incidentally, the Hospital in the Shah Zinda Cemetery had a large canal traversing it.110

Under the Shaibanids (1500–99) it was the turn of Bokhara to prosper, especially after its reconstruction by Abdul Aziz Khan (1540–49). The city now had more than ten congregational mosques, more than 200 ward mosques, and 150 madrasas. The city was divided into 200 wards (guzar) of 30–60 houses, each with its mosque, school, and water cistern (hauz). Each ward was on one of the main streets, from which side streets (paskucha) and cul-de-sacs (dalon) ran off. The bazaar crossing the city from east to west had domes at the intersections.111 There are impressive remains in Bokhara of the 16th century including the Kalyan, the Char Bagh, and the Khoja Zainuddin Mosques, and the Miri-Arab, Abdul Aziz Khan, and Kukeltash Madrasas. In them there are attractive combinations of intersecting ribs, intersecting net pendientes, mukarnas, and geometric arabesques in the transitions and half domes.112

Meanwhile, in Iran itself Shah Ismail (1499–1524) had assumed supreme control, and had inaugurated the Safavid dynasty. The scions of this family were, after a long interval of foreign rule, true sons of Iran in respect of race, and they openly adhered to the Shi'a faith. One of Shah Ismail's few buildings was the Tomb Mosque at Ardabil (1524) which still survives.113 His successor Shah Tahmasp (1524–76) made Qazvin
his capital, and built an Ayvan-i-Chihil Sutun there in which according to Qadi Ahmad (c. 1606), the monarch himself painted one or two scenes, including an episode from the life of Joseph. Opposite his talar, Chardin says that Tahmasp had built a palace on the sketches given him by a Turkish architect. The greatest Safavid builder, however, was Shah Abbas (1587–1628) who made Isfahan his capital. Although Shah Ismail had built a palace in Isfahan in 1505, and had widened its Maydan in 1509, it was Shah Abbas who set about seriously replanning the city. A vaulted bazaar with two-storey shop bays lit through overhead roundels connected the old Seljuk Jami with the northern end of the new Imperial square, and was completed by 1620. The enormous circuit of this square measuring 500 x 174 yards was also niched out with a double tier of shop alcoves. The town square was no new feature in the East; there was one for example in Nineveh in 676 BC. Later, from Appian we learn of the public squares of the Persians where people assembled to seek justice or to learn the laws. In 985 Muqaddasi wrote of a great town square (rahabah) at Firuzabad in Iran. The Friday Mosque built in the suburb of Nishapur by Amr ibn Layth the Saffavid, c. 895, faced the public square called the Review Ground, while the Governor’s palace faced the adjacent square. In Samarcand there is the eminent Registan Square, on one side of which is the Madrasa of Ulugh Beg built in 1420 after the plans of the ruler, on another side is the Shir Dar Madrasa (1648) of Jalangtash-Bahadur of the Astarkhanid dynasty, and on the third side is the Tilla-Kari Madrasa of 1660. Finally, I may mention the maydans of Syrian towns; the Maydan al-Akhdar of Aleppo for example measured 750x70/50 cubits according to Ibn Shaddad (1216–85), while in the Maydan at Damascus processions and military parades were held, and polo was played.

On the south of the Isfahan square Shah Abbas built the new congregational mosque, on the left a Royal Chapel, and facing it on the opposite side a pavilion called Ali Qapu from where he could review his 40,000 cavalry twice a year according to Manucci. Above the gateway-cum-guardroom was a platform covered with a flat roof on tall timber supports, no doubt corresponding to the wooden tower (alkushk) in the esplanade outside the city of Bish-dagh from which the Uzbeg Sultan witnessed archery exercises. At Ali Qapu cramped stairs led to the various floor levels which contain the rest rooms. Their only interest derives from the murals, portraying some fauna including peacocks and gazelles, as well as ‘moon-faced darlings’. The vaults of the upper storey are riddled with niches of a curious shape, now empty like the nests of bats, but once filled with jars of crystal, cornelian, agate and the like, as Chardin had observed.

The gateway leads to an open palace-pavilion in a garden setting. Its porch is built on the ancient talar scheme of a high flat roof on timber supports. Of these the central bay, under which was a water basin with jet, is emphasized by elevating the roof over it, and the four supporting columns are carried on bases consisting of crossed lions seated on their haunches. This porch, which was no doubt inspired by its Achaemenid prototype (Shah Tahmasp had taken the Mughal Emperor Humayun to visit the ruins of Persepolis in 1544), consists of twenty columns, despite this palace being called the Chihil Sutun or ‘Forty Columns’—evidently because of the reflecting pool which doubled the number. The Qazvin palace also had twenty gilt and ornamented pillars, and there were in it pairs of chained lions with golden basins full of water before each. In the Isfahan palace, at the rear of an iwan opening into the talar was a canopied throne-niche at the sides of which were ancillary chambers, and at the back a large triple domed audience hall at right angles to the main axis. The walls of this hall are covered with wall-paintings; Chardin says they represented Abbas the Great’s battles against the Uzbeks. According to Kruinski the original palace was destroyed by fire, and the present building dates from Shah Sultan Husain, or after 1694. In the garden long reflecting pools emphasize the main axis of the palace to which they serve as preface and epilogue, while the plot is divided into sixteen parts by means of rose-bordered paths.

If Safavid domestic architecture was revivalist to some extent, their religious style was the culmination of a long and well-tested tradition. The
Masjid-i-Shah (1616–30) at Isfahan, built by the architect Abu Ali Akbar, might not be absolutely free of blemishes, but it was as near perfection as Persia ever attained. The Mosque is entered from the Maydan by a rather stilted gateway clad in faience mosaic tiles. Little white flowers fill the mukarnas cells in its canopy, while a glazed cable moulding rises from an alabaster urn and encompasses the portal. The plan of this gateway is like a concertina with one flap open so as to swivel the approach to face Mecca (Figure 56), a device noted earlier at Cairo. Over the sanctuary rises a subtly swelling dome; the ivan arch below swings away into a swallow-sweve, and between the two lies a parapet of text (Plate 134). In the half-dome of the portal are intersecting ribbed pendentives, and on the dome itself a pattern of vine in tile spiralling away like eels in a turquoise sea. Minarets are engaged beside the portal but do not descend to the ground. The lateral halls are covered with domed bays on groined pendentives.

Because the Mosque of Lutfullah (1603–18) is attached to the interminable arcades of the piazza it has no separate identity. Its dome too has a full seductive swell which becomes warm and saffron when the light is dying. Its surface is active with bold inlaid vineswhims that become dervishes. A guard stripe marks where the spring of the dome begins, and below it a frieze of Naskhy goes romping on its way (Plate 135). The fenestration of the drum is grilled over with rambunctious vine careering merrily, and between these is the name Allah interspersed on a puzzling block. Sunbeams flicker through the grilles into the dark chamber. Inside, the faience in the canopy of the dome is so conceived that from a rosebush thicket in the zenith a shower of eye-shaped peacock plumes come floating down on all sides, enlarging as they fall (Plate 136). The eight arched panels of the octagonal chamber are framed by coil-spring mouldings. Between their spandrels eight kite-shaped pendentives go up to meet the circular rim of the dome. A deferred corridor leads from the maydan entrance into the chamber from such an angle that the mihrab appears on the opposite end from the door, where indeed it should.

After these fine buildings of Shah Abbas, the tempo of architecture was slowed (except for the building of baths, caravanserais, and domically vaulted bazaars), its quality deteriorated, and there was an abrupt political decline. One can hardly point to half a dozen notable buildings in and after the turbulent 17th century. One of these is the Shrine of Imam Reza at Meshad whose main ivan is furrowed with a myriad facet surfaces glimmering with gold. The dome with gilt copper plates executed by Kamal al Din Mahmud of Yazd (1606), plating completed 1676 and operation seen by Chardin in 1673 is not nearly as successful as this furrowed ivan in the Old Court erected by Ali Shir Nawai (c. 1490) and plated in 1734, or the gold minaret (1730) as flat sheets reflected a dull and sullen glare. The Persian monarchs particularly Nadir Shah (1736–47) and Fath Ali Shah (1797–1834) thereafter took upon themselves the task of gilt plating the domes of the Shahid Shrines in Iraq including those of Ali at Najaf, Husain at Kerbela, Imam Musa at Kazimein, and Imam Mahdi at Samarra.
1. Quseir Amra, wall painting.


3. Qasr al-Hair al-Gharbi, statuary, grille and blind arch at back of gallery.


8. Khirbat al-Mafjar, statue of owner, presumably the Caliph.


9. Jerusalem, the Dome of the Rock, an early flat mihrab in Cave
10. Jerusalem, the Dome of the Rock.

11. Jerusalem, the Aqsa Mosque.

12. Damascus, the Great Mosque, mosaic and marble window grille under west portico.

13. Kairouan, the Great Mosque, minaret.

14. Kairouan, the Great Mosque, main façade of court.

15. Kairouan, the Great Mosque, dome over mihrab.
16. Tunis, the Great Mosque, dome at the head of nave.

17. Samarra, the Great Mosque, Malwiya minaret.

19. Samarra, Jausaq al-Khakani Palace, the Bab al-Amma.

20. Cordova, the Great Mosque, sanctuary arcades.

22a. Cordova, Madinat al Zahra, pilaster capital.

22b. Cordova, the Great Mosque, mosaic over mihrab niche.

21. Cordova, the Great Mosque, creasing over door of San Esteban.

23. Cordova, the Great Mosque, ribbed vault in maqsura.
24. Cordova, the Great Mosque, ribbed vault at head of nave of al-Hakam, now chapel of Villaviciosa.

25. Cordova, the Great Mosque, decoration over doorway in west façade.

27. Toledo, Mosque of Bib Mardom, side elevation.

28. Toledo, Puerta Visagra.

30. Saragossa, Arches from Hudid Palace.

31. Saragossa, Arch screen from Hudid Palace.

32. Saragossa, Corbels from Hudid Palace.

33. Seville, the Great Mosque, mukarnas vault over entrance to Court.

34. Robat, Morocco, Minaret of the Mosque of Hassan.
35. Seville, the Giralda Minaret.

36. Granada, the Alcazaba of the Alhambra.

37. Granada, the Alhambra, Court of the Myrtles.

38. Granada, the Alhambra, azulejos dado.
39. Granada, the Alhambra, Court of the Lions.

40. Granada, the Alhambra, Hall of the Two Sisters.

41. Saragossa, La Seo Presbitery, façade.

42. Burgos, Las Huelgas Monastery, stucco revetment of cloister vault.
43. Burgos, Las Huelgas Monastery, arches in chapel.

45. Burgos, Las Huelgas Monastery, ribbed dome over chapel.

44. Burgos, Las Huelgas Monastery, cupolas over vestibule of chapel.

46. Saragossa, Le Seo, lantern.
47. Toledo, Santa Maria Bianca, aisles.

49. Granada, Hospital of Muhammad V, detail over portal, now in Archaeological Museum, Madrid.

48. Seville, the Alcazar, entrance façade.

50. Kairouan, Aghlabid Cistern, buttressing.
55. Cairo, Guyushi Mosque.

56. Cairo, Guyushi Mosque, kiosk and cresting.

57. Cairo, al-Azhar, cupola at head of transept.

58. Cairo, al-Azhar, court façade.

59. Cairo, al-Aqmar Mosque, entrance façade.
60. Cairo, Mosque of Salih Talai, portico in antis.

61. Cairo, Mausoleum of Sayyida Ruqayya.

62. Cairo, Mausoleum of Sayyida Ruqayya, interior.

63. Cairo, Bab al-Futuh.
64. Cairo, machicolation on Fatimid wall.

66. Aleppo, Citadel, bridge, and barbican.

65. Cairo, Bab al-Futuh, detail.

67. Cairo, Mausoleum of Imam Shafei.

68. Cairo, Madrasa of Malik Salih, minaret.
69. Cairo, Mosque of Baibars, north-east portal.

70. Cairo, Madrasa of an-Nasir Muhammad, entrance.

71. Cairo, Mausoleum of Qalaun, façade on street.

72. Cairo, Mausoleum of Qalaun, minaret.
73. Cairo, Mosque of an-Nasir Muhammad, minaret.

74. Cairo, Mosque of Maridani, minaret.

75. Cairo, Madrasa of Sultan Hassan, bronze doors, now at Mosque of al-Muayyad.

76. Cairo, Tomb of Tankizbougha, Mamluk Cemetery.
77. Cairo, Khanqa-Mausoleum of Barquq and Farag.

78. Cairo, Khanqa-Mausoleum of Barquq and Farag, cupola.

79. Cairo, Mausoleum of Qaitbey.

80. Cairo, Mosque of Muayyad, vaulting of vestibule.

81. Cairo, Mosque of Sinan Pasha at Bulaq.

82. Cairo, Mosque of Muhammad Ali.
83. Konia, Mosque of Allaedin, façade.

84. Konia, Mosque of Allaedin, entrance.

85. Konia, Karatai Madrasa, iven, cupola and pendentive.

86. Sivas, Turbe of Izzuddin Kaikaus, decoration flanking entrance.

87. Kayseri, Döner gunbad.
88. Erzerum, Turbe of Sultan Saltuk.

89. Divrik, the Great Mosque, east portal and tent dome.

90. Sivas, Guduk-Minare.

91. Konia, Turbe of Jalaluddin Rumi.
97. Erzerum, Yakutiye Madrasa, minaret.

98. Sivas, Gök Madrasa, animal heads on right of entrance.

99. Aleppo, Citadel, arch over entrance.

100. Bosphorus, Rumeli Hissar.
101. Brussa, Ulu Jami, south side.

102. Brussa, Mosque of Murad II.

103. Konia, Selimiya Mosque.

104. Istanbul, Mosque of Bayazid.

105. Istanbul, Sulaimaniya Mosque, west flank.
106. Istanbul, Sulaimaniya Mosque, interior looking south-east.

108. Istanbul, Mosque of Sultan Ahmad.


109. Istanbul, Mosque of Sultan Ahmad, interior looking north-east.
110. Istanbul, Mosque of Ortakuy.

112. Baghdad, Tomb of 'Sitt Zubeida'.

111. Baghdad, Caliph Nasir's Palace, cloister.

113. Rayy, Tomb Tower.
122. Isfahan, Masjid-i-Jami, oratory vault.

123. Isfahan, Masjid-i-Jami, oratory vault.

124. Isfahan, Masjid-i-Jami, small dome chamber.

125. Isfahan, Masjid-i-Jami, small dome chamber, squinch.

126. Ardistan, Masjid-i-Jami, iwan from sanctuary.
127. Qazvin, Masjid-i-Jami, squinch in sanctuary.

128. Sangbast, Mausoleum of Arslan Jadib, transition zone.

129. Sultaniya, Mausoleum of Uljeitu, gallery vaults.
130. Varamin, Masjid-i-Jami.

131. Yazd, Masjid-i-Jami, lateral hall.

132. Herat, Gunbad-i-Sabz, vaulting.

133. Sultaniana, Mausoleum of Mulla Hassan.
137. Isfahan, Bridge of Khaju.

138. Delhi, Kutub Minar.

139. Ajmer, Arai din ka Jhonpra, inscription on pier of sanctuary portal.

140. Ajmer, Arai din ka Jhonpra, sanctuary screen.
141. Ajmer, Arai din ka Jhonpra, carved and coffered ceiling.

142. Delhi, Tomb of Ilutmish, mihrabs and squinch.

143. Delhi, Alai Darwaza to Kuwwat-ul-Islam Mosque.

144. Delhi, Tomb of Firuz Shah, cupola.
145. Delhi, Tomb of Firuz Shah, cupola.

146. Delhi, Tomb of Bare Khan.

147. Delhi, Masjid-i-Kuhna.
148. Delhi, Masjid-i-Kuhna, interior.

150. Ahmadabad, Jami Masjid.

151. Ahmadabad, Mosque of Rani Sipari.

149. Pandua, Eklakhi Mausoleum.

152. Ahmadabad, Mosque of Sidi Sayyid, window grille.
156. Gulbarga, Jami Masjid, transverse vaulted gallery.

157. Bidar, triple moat and fortification.

158. Bijapur, Gol Gunbad.

159. Bijapur, Jami Masjid, from the court.

160. Bijapur, Jami Masjid, aisle next to the court.
161. Bijapur, Mosque of Ibrahim Rauza.

162. Fatehpur Sikri, Divan-i-Khas, throne capital.

164. Fatehpur Sikri, Jami Masjid, transverse view through sanctuary.

163. Fatehpur Sikri, Turkish Sultana’s House.

165. Fatehpur Sikri, Salim Chishti’s Tomb.
171. Delhi, Fort, Diwan-i-Khas.

172. Agra, Fort, Amarsingh Gate.

173. Delhi, Jami Masjid.
174. Lahore, Tomb of Asaf Khan.

175. Agra, Taj Mahal.

176. Lahore, Badshahi Mosque.
Persian Shias also delighted in silvering the back of glass, and in sheathing vast interior surfaces with mirrors. The effect this achieved may be seen at its best at the Shrine of Qumm dedicated to Fatima al-Ma'suma, the sister of the Meshad saint. Illuminated by powerful lights at night the multitudinous cells of the stalactite half-dome sparkle and gleam with depth upon depth of intense reflection. Needless to say for the modern taste the effect is quite insufferable by daylight.

Hitherto square painted tiles had played a subsidiary role. Now they began to displace the laboriously fitted faience mosaic each of whose colours had to be fired in separate operations because of their varying temperature requirements. The new haft rangi or septochrome process lacked the glossy luminosity of the latter; nor did it demand such meticulous execution in the fitting together. Nevertheless the royal theological college of Isfahan, the Madar-i-Shah (1706–14), proved the splendour of which it was capable. From the point of view of composition the sanctuary portal, the bulbous dome, and the flanking minaret are perhaps a little too compact, but the reflecting pool and green trees in the court draw the attention away from this. Moreover, when it is seen through the avenue of chenars which border the water-coursed boulevard outside, the dome flashes like a blue Kashmirian shawl with pirouetting arabesques and reflecting high-light tints.

Shah Abbas’s boulevard Chahar Bagh, which is 150 feet wide, continues on and leads to the river which is straddled by the bridge of Allahvardi Khan, a minister of Shah Abbas. This bridge, carried on 33 arches, is 10 yards wide, 388 yards long, and was erected c. 1610. The roadway for beasts and wheeled traffic is supported on groined vaults protected by high walls which are flanked by galleried footpaths intended for pedestrians (Figure 57). Piers are buttressed against the force of the current, while the ends are strengthened with round bastions. An unusual feature of this bridge is that it contains some gaily painted rooms, evidently intended as private pleasances. When Shah Abbas II erected his own bridge, the Pul-i-Khaju (c. 1650) on the same river at Isfahan, he further developed the idea of a pleasure over the water by constructing two halves of an octagonal structure with radial ivans (over which is a pent-house reached by stairs) projecting out of the middle, together with chambered galleries on both extremities of the bridge (Plate 137). The water is dyked up on the upper side by a platform and the excess carried off laterally for purposes of irrigation. The lower side of the bridge is treated as a promenade with successive steps leading down to the water level. Thus this bridge is equally effective for leisured recreation while rendering a practical service to the community.

NOTES

1. E. Bretschneider, Chinese Medieval traveller to the West, pp. 82–3.
4. See Herzfeld’s list in Der Islam, xi, 1921, pp. 163–7, 40 of these were Arab and the rest by provincial Persian dynasties.
6. C. Schefer, Relations due Voyage .... 1881, Appendix, p. 278.

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7. The Oriental Geography of Ebn Haukal, tr. W. Ouseley, p. 104. The site is now being excavated, and a mosque has been found (D. B. Whitehouse, in Iran, v, 1967, pp. 141–2).

8. Abu Dulaf...tr. V. Minorsky, 1955, p. 34. Similarly we have the report of Clavijo (1403–6) that the Jalarid Sultan Uways (1356–74) had 20,000 chambers and apartments in his Daulat Khana Palace at Tabriz (C. R. Markham, Embassy of Ruy Gonzalez de Clavijo, p. 89).


10. Baihaqi further attributes to Masud the cantonnement of Bast, the new serai at Ghazni, and the palace, parade ground and ‘admirable’ serai at Nishapur (Elliot and Dowson, The History of India..., ii, p. 61).

10a. Farukhi’s reference (Divan, Teheran, 1922, p. 131) to the pavilion of Mahmud’s brother Yusuf as enabling one to look through doors in four different directions must imply a cruciform hall in the Abbasid manner (but cf. A. Bombaci in Encyclopaedia of World Art, VI, 1962, p. 303).


15. Ghiasuddin’s winter capital was in Zamin-i-Dawar 40 leagues from Firuzkoh where he had a pavilion in a garden full of a variety of trees, while adjacent to it was the game enclosure, according to Minhajuddin (tr. Raverty, p. 386). The main city of the region was Dawar which, says Muqaddasi, was three marches on the bank of the Helmand above Bast (Le Strange, Lands of the Eastern Caliphate, p. 347).


17. At Nishapur c. 950 a Tahirid is stated to have imitated ancient constructions, and at Kermanshah the proposed plan of a chief’s dwelling turned out to be identical to that found while digging its foundations (Abu Dulaf...tr. Minorsky, 1955, pp. 45 and 59).

18. Other 8th century mosques known from literary sources include Hajjaj’s Bull Mosque, Qazvin (700); Samarcand (712) and Bokhara (713), both by Qutaiba; Balkh (725); Nishapur (754) by Abu Muslim; Sari (757); Isfahan by Mansur (759–70); Qazvin (790) and Amul (793–4), both by Harun; and Bokhara (795) by Yahya Barmaki, to mention only a few. (cf. V. Minorsky ‘Geographical factors in Persian Art’, in Bulletin of the School of Oriental Studies, ix, pt. 3, pp. 621–52).


21. See E. Herzfeld, Archaeological History of Iran, 1935, figs. 12, 13.

22. E.g., the late Greek lexicographer Hesychius defines koronis as ‘the finishing piece placed on the building’.

23. A. Godard, in Athare-Iran, 1936, 1, p. 112.

24. It is from Nuraddin’s extension of the Harran Mosque that the earliest mukarnas capital dates (1174). It is fortunately inscribed. Nuraddin was a prolific builder, and a chronological list of his works has been compiled. (N. Elisséeff, in Bulletin d’ Études Orientales, xiii, 1951, pp. 5–39).


26. Another fine example of carved brick of this period is the 100 metres inscriptional band on the Harba bridge of al-Mustansir dated 1231, 90 km. north of Baghdad.


29. Was this a reminder that he had been assassinated (in 1012) by being stripped of his cloaks and blankets and left to perish from exposure? (cf. The Kitabi Yamin, tr. J. Reynolds, p. 412) Alternatively this may be an example of the practice described by Ibn Battuta, which he says he had seen other kings do also. He says that Saru Khan, ruler of Magnesia, d. 1345, had his son embalmed and placed in a wooden coffin with a lid of tinned iron; the coffin was raised on high trestles in a domed chamber without a top. He says that this was so that its odour should escape, and after this the dome would be roofed, and the boy’s coffin placed where it could be seen on ground level (tr. H. A. R. Gibb, ii, p. 447).

31. Benjamin of Tudela (1166–71) says the Seljuk ruler Sanjar had the Prophet Daniel’s coffin placed in a crystal coffin and suspended from the middle of the bridge over the Tigris at Shushan, in the hope that it would settle the dispute for its possession between Jews who lived on one bank and Muslims who lived on the other. (ed. Gruenbut and Adler, 1903, p. 70). Note that the Zoroastrian Dakhma or Tower of Silence, ‘is ideally separated from the ground by means of a golden thread which is supposed to keep it suspended in the air.’ (Ravaet, ap. Spiegel: Uebersetzung des Avesta, u, p. xxxvi, J. Darmsteter, The Zend Avesta, S.B.E., iv, 1880, p. xci, n. 4.)

32. The Avesta recommends that the corpse be laid on the highest summits, or ‘if they cannot afford a building they will lay the dead man on the ground... beholding the sun’ (Vendidad. Farg. vi, 45, 51).

33. A. Khatchatrian argues that the flanged star-shape of this tower was inspired by a building such as the Church of Berger at Ani, with flanged exterior and star-plan interior and dated by him in the early 11th century but by another recent author as in the 13th century (see Cahiers archéologiques, vi, 1952, p. 91f, and Arts Asiaticques, u, 2, 1955, pp. 137–44).

33a. 1139 is only the date of its lock.

34. B. N. Zasypkin, Arkhitektura Strednej Azii, 1948, fig. 42, pp. 64–5.

35. The dissemination from Gurgan to Ghazni obviates Indian astronomical influence in the latter, a view advanced by Diez (‘Die Siezgesturme in Ghazna als Weltbilder,’ in Kunst des Orient, 1, 1950, pp. 37–44).


37a. There is another example of double spiral staircase at Samiran (P. Willey, The Castles of the Assassins, 1963, pl. opp. p. 96). Moreover, the Ottoman minaret at the Uç Serefeli Jamı at Edime in Turkey has three spiral staircases superimposed one on top of the other (G. Goodwin, A history of Ottoman Architecture, 1971, 1987, p. 99).


38. Cf. G. A. Pugachenkova, Development of South Turkmenian Architecture ..., pp. 132–7 (Big Nagim Qala is assigned to the 6–7th century). But note that a continuous succession of half round buttresses goes back at least to the Kassite period at Ur (L. Woolley, Ur Excavations, v, 1939, pl. 34), and later juxtaposed semi-cylinders ornamenting exterior walls are found in Assyria at Khorsabad (G. Loud and C. B. Altman, Khorsabad, u, 1938, pp. 37–9; pls. 83–5).


41. G. Salmon, Introduction topographique a l’histoire de Baghdad, 1904, pp. 86–7. It can be traced back further to Sassanid Palaces e.g. at Damghan and Kasr-e-Shirin (c. AD 600) (A. Godard, L’Art de l’Iran, 1962, figs. 180–81).

42. J. Sauvaget, ‘Observations sur quelques mosquées seldjoukides...’ in Annales de l’Institut d’Etudes Orientales (Faculte des Lettres d’Alger). iv, 1938, pp. 81–120, and A. Gabriel, In Memoria Hamil Edhem, i, 1947, pp. 211–18, esp. p. 213. A. Godard (‘Les anciennes mosquées d’Iran,’ Arts Asiaticques, iii, 1956, Fasc. 1, pp. 48–63, and Fasc. 2, pp. 83–8) has returned to the issue and offered further examples of what he believes were mosque-kiosks subsequently transformed; these include the Masjid-i-Jamı of Barsian, Burujird, Natanz, Marand, Urmia (now Rezaiya), Qumm, and Sawa. I may point out that five of Shamsal Mulkg’s mosques in Bukhara c. 1068 had courtyards—two with minarets (The History of Bukhara, tr. R. N. Frye, 1954, p. 51).

43. See J. Strzygowski, L’ancient art Chrétien de Syrie, fig. 84.


45. The Haghat-porch, for example, may be as late as c. 1180.

46. Der Nersessian, Armenia and the Byzantine Empire, pl. vii, 1, and p. 80.


48. E. Diez, Die Kunst des islam, pp. 41–2, 540, and Abb. 221.

49. Similarly at the Masjid-i-Jamı of Qazvin, Qumm, Natanz and Sawa, the fronting ivans date from much later than the domed chambers (for relative dates see A. Godard in Ars Islamica, viii, 1941, pp. 6–7).


52. E. Herzfeld, Iran in the Ancient East, 1941, pls. xci, xciii.

53. L. Waterman, Preliminary report upon the Excavations at Tal Umar, Iraq, 1931, Pt. 1, p. 19, fig. 7. The ivan is suggested to be a direct modification of the megaron that prevailed in this region under Greek influence, rather than be traceable to the Hittite hilani as Bell maintained (ibid., Pt. 2, 1933, p. 31).

54. E. Herzfeld, Archaeological History of Iran, 1934, pl. xvi, p. 98.

54a. W. Andrae and H. Lenzen, Die Partherstadt Assur, 1933, pl. 11.


56. A. Godard, 'L’origine de la Madrasa, de la Mosquée et du Caravanserai a quatre ivans,' in Ars Islamica, xv–xvi, pp. 2–5, figs. 2, 3, 5. Creswell holds that the Rayy ruin is a house not madrasa, and Khargird is a mosque not a madrasa (Muslim Architecture in Egypt, ii, pp. 132–3).

57. It would appear to have arrived early in the Caravanserai of Anoshirvan, the Ziyarid Prince, at Ahuvan (near Simnan) between 1029–40 (E. Herzfeld in Zeitschrift der Deutschen Morgenlandischen Gesellschaft, 1926).


59. Since it does not have a mihrab and could not have had a religious function Sauvaget maintained (op. cit., p. 89) that this domed hall served the Sultan as a place for disrobing and resting before prayer, and for receiving good wishes, on the occasion of the two annual festival prayers.

60. The composite quatrefoil pier built up of brick has an ancient origin and is found, for instance, at Tello in Chaldea (De Sarzec. Découvertes en Chaldée, p. 62), and in Susa where the bricks give the name of Sutruk Nahunte (G. Contenau, in Revue d’Assyriologie, 1941, vol. 38, p. 52). In the Sassanian Palace of Sarvistan the piers of the oblong halls are double, while at Qasr Kharana they are treble. In Khusrav’s Palace at Qasr i Shirin four trefoil piers form a square suggesting that they carried a dome (J. de Morgan, Mission Scientifique en Perse, 1894, cartes, pl. 10). At the Parthian site of Nissa before 1st century AD are four quatrefoil piers in a square hall (G. A. Pugachenkova, op. cit., pp. 79–80).

61. Siroux regards the dome chamber of the Masjid-i Jami of Burujird to be pre-Seljuk of the 10th century, and the flat tent-like exterior of the dome to be a transformation by the Qajars (in Bulletin of the Institut Francais d’Archéologie Orientale, 46, 1947, pp. 239–58).

62. Trust funds for mosques had long been in use. We hear of Adud ad-Dowlah restoring the suburban mosques of Baghdad to their trust funds in 979. (Ibn Miskawaih, tr. Margoliouth, ii, p. 443). Ibn Talun (863–83) had bequeathed several houses whose revenues were assigned to his Mosque (Maqrizi, iv, 83).

63. J. Hackin, Archéologie Bouddhique, Tokyo, 1933, fig. 47.


64. A. M. Pribiutkova, Pamyatniki arkhiitekturni xi veka v Turkmennii, Moscow, 1955, pp. 65–75.

65. Ibid., pp. 77–110.


72. Now at the Cambridge University Library. R. Levi, in the Journal of the Royal Asiatic Society, 1/2 (1946), pp. 74ff. He claims that there were 24
caravanserails, 1500 workshops, 30,000 beautiful houses, besides gardens, baths, shops, mills, weaving and dyeing establishments, paper factories and a mint. It is regrettable the Rashiduddin’s *Book of Animals and Monuments* in which he set out rules for building monuments (domestic, religious, funerary and military) is now lost (D. Wilber, in S. P. Sehrr-Thoss, *Design and Colour in Islamic Architecture*, 1968, p. 257).

73. *Nuzhat al Qulub*, tr. Le Strange, ii, 1919, p. 80.

The Taq e Kisra’s dimensions are: depth 150 feet, span 84 feet and height 105 feet.


75. Ibid., ii, p. 345.

76. The fortified exterior of the courtyard has been preserved in the drawing of Hommaire de Hell, *Voyage en Turquie et en Perse*, 1859, Atlas, pl. lii.

77. R. A. Jairazbhoy, *Oriental Influences in Western Art*, Bombay, 1965, cf. p. 281. According to Rubruquis, a Persian William Boucher had already made for the palace of Mangu Khan (1266–80) at Karakorum a fountain with four silver lions from whose mouths spouted water into four silver basins. But the silver tree in front of the throne and the triple ailed hall of audience (H. H. Howorth, op. cit., i, 1876, p. 191) seems to be Abbasid ideas. The four spouting lions with ornamental pools next appear to have been copied before 1334 in the audience hall of the Palace at Birje (cf. Ibn Battuta, op. cit., ii, p. 442).


79. Some of it closely resembles the contemporary polychrome plaster revetment in the tent domed octagonal Imamzada of Ali ibn Jafar at Qumm (1301 and 1339), one of the many mausolea erected on the outskirts of that city.

80. C. R. Markham, *Embassy of Ruy Gonzalez de Clavijo to the Court of Timur*, p. 93.


84. This feature, however, is not an innovation as floral scrolls moving behind inscriptions occur at least by the first quarter of the 11th century in illuminated books, e.g. Quran frontispiece of the Yemen prince (1025) (Sakisian in *Ars Islamica*, 1939, fig. 7). For a sensitive visual analysis of this mihrab and plea for an introspective approach toward Islamic architecture see E. Schroeder in *Journal of Near Eastern Studies*, xv, April, 1956, pp. 97–8.

85. Other examples are the Masjid-i-Jamis of Isfahan and Abarquh.

86. This Jami had been begun under Mongol rule by Rukn ad Din Muhammad in 1323 and completed by his son and minister in 1331. The decorative faience, however, dates from many periods: 1375, c. 1415, 1417–24, 1436, 1442, 1453, 1455, 1456, 1470, c. 1514 and 1703 (see M. Siroux, ‘La mosquée Djoumeh de Yazd,’ in *Bulletin de l’Institut Francais d’Archéologie Orientale*, 44, 1947, pp. 119–176).

87. One of the earliest references to an air-shaft to convey cooling breezes down into a sitting room is in an inscription of Sargon ii (722–705 BC) (cf. Luckenbill, *Ancient Records, Assyria*, ii, p. 73).


89. The Lion surmounted by the sun occurs as a zodiacal symbol in the second half of the 12th century on a pier of the Tigris bridge of Jazirat ibn Umar. (*Ars Islamica*, v, 1938, p. 119). See now Ahmad Kasravi Tabrizi, ‘The history of the lion and the sun’ (pamphlet in Persian), Tehran, 1930; also *Hunar va Mardan*, nos. 32–3, 1965, p. 21f.


91. Ibid., pp. 227–8.


94. The melon dome is already represented in pre-Islamic times in this region in the murals of Panjikand S. E. of Samarcand. The building in the painting is claimed to be an adyton of a Persian fire temple, with the persons under the dome mourning for the god Siyavush (A. L. Mongait, *Archaeology in the USSR* (in Russian), 1955, pl. opp. p. 292. Note that the stepped crenellations are pierced).

95. For the mechanical and mathematical features of this dome see M. D. Limongelli, ‘...la stabilité de la coupole au Mausolée de Tamerlan a Samarcande,’ in *Bulletin de l’Institut d’ Egypte*, iv, 1921–22, pp. 77–92.

96. Prior to this the mausoleum of Timur’s sister Kuchuk Bika (1371) in the Shah Zinda Cemetery at Samarcand, had a reeded single dome as Creswell observes (‘The history and evolution of the dome in Persia’, in *Indian Antiquary*, xliv, July 1915, p. 149). However, the stupa of Idiqut Shari in the oasis of Turfan has a stilt and appears to be a double dome (Monneret de Villard, ‘Sull origine
della doppia cupola persiana', in Architecture e Arti decorative, i, 1921, pp. 315–24). There is no evidence that the sculptured bulbous domes of Buddhist India had any influence on those of Persia and Muslim India despite the presumption of Havell and W. Born (cf. 'The Origin and distribution of the bulbous dome', in Journal of the American Society of Architectural Historians, III, 1943, p 48).

101. The restoration of these tiles which is almost perpetually in progress surprisingly reveals that the craftsmen are capable of repeating the best work of their forbears, and it is instructive to see the drawing of the cartoons, the cutting of the mosaics, their glazing and their assembly in much the same manner as they must have been done originally.
103. The Babar Nama, tr. A. S. Beveridge, i, p. 80.
107. L. Bronstein, in Bulletin of the Iranian Institute, N. Y., 1946, p. 167. The building, however, was still there c. 1650 when Evliya referred to its wall polished like Chinese paper, though he calls it Dihsheeti-Beheshi or 'the Terror of Paradise,' and confuses it with Jahan Shah's Mosque (Tr. J. Von Hammer, ii, p. 135).
117. The market of Trajan at Rome similarly consisted of a covered hall flanked on both sides by shops. Assuming that at the time there were such markets in the East, it is possible that it was Apollodorus of Damascus who introduced them into Rome for he was the architect of Trajan's Forum (R. M. Riefstahl, 'Mercati e fonachi coperti nel 'Oriente Islamico,' in Roma, x, 1932, pp. 159–70; and in Parnassus, iv, no. 6. 1932, pp. 17–19). Most of the markets of Mosul were roofed, c. 985 (Al-Mugaddasi, tr. Ranking, p. 225). As Ibn Jubayr described it in 1184, the entire market at Harran was roofed with wood, while great plastercoated domes occurred wherever the market intersected. A dome at the crossing of four markets exists at Isfahan, and is held to date from c. 1522, under Shah Ismail (M. Siroux in Mélanges Islamologiques, 1, 1954, pp. 23–7).
118. Tr. A. Heidel, in Sumer, xii, 1956, nos. 1, 2, p. 15.
120. G. Le Strange, Lands of the Eastern Caliphate, 1905, p. 256.
121. Ibid., p. 383.
127. Another example of this was at the Sultan's Palace at Tiflis. As described by Chardin in 1672, the State Room (110x40 feet) had gilt and painted pillars
35–40 feet high, and the hall was open on the side of the river. *(The travels of Sir John Chardin into Persia and ye East Indies*, 1686, p. 215).


131. Columns rising from urns must go back to the earliest period of Muslim architecture in Persia as evident from the representation on a bronze vessel (e.g. see L. Ringbom, *Graltempel und Paradies*, 1951, p. 78f.). But they are of course much older in India (S. Mayassis, *Architecture Religion Symbolisme*, 1, 1964, fig. 547).


133. Architectural gilt plating has a long history and has been traced elsewhere by the present writer (see Art and Cities of Islam, 1964, pp. 41–51).

134. This was a late development since Chardin reported that the Persians did not (in 1672) know the technique of silvering their glass over and imported these goods from Venice (Sir John Chardin's *Travels in Persia*, ed. Penzer, p. 275). Mirror glass may have been imported, but window glass was in general use in Akbar's time (Abul Fazl, *Ain i Akbari*, tr. H. Blochmann, i, p. 224), in Mughal India. Window glass existed in the dome of the bathroom of Mardawij in Isfahan in AD 934 (Miskawaih, *The Eclipse of the Abbasid Caliphate*, tr. Ahmedroz and Margoliouth, i, 1921, p. 355).

135. In the medium of pottery a seven-coloured technique was already out of vogue when the Kashani Abulqasim wrote his treatise on pottery in 1301 (now in the Istanbul Library). But this may have referred to the minal wares particularly from Kashan and Rayy, where the additional colours were fixed by a second short firing (Ritter, Ruska, Sarre and Winderlich, *Orientalische Steinbücher und persischen Fayencetechnik*, Istanbul, 1935, and A. Lane, *A Guide to the Collection of Tiles*, 1939, p. 7 Victoria and Albert Museum).

136. Superstructures on a bridge are encountered as early as 1059 in the description of the bridge across Ghazni river by Bihaiqi. This massive bridge which was destroyed by a flood had its top securely covered over, and each side of the roadway was flanked by a row of shops (Elliot and Dowson, *The History of india...*, ii, pp. 114) as the Ponte Vecchio (1345) at Florence. The bridge at Jaunpur in India built by the Kabul architect Afzal Ali in 1564–68 for Munim Khan at the suggestion of Akbar has 28 kiosks over projecting buttress piers, but they are stated to have been added as late as 1847 (M. Fasih-ud-Din, *The Sharqi Monuments of Jaunpur*, Allahabad, 1922, p. 41). However, one of the inscriptions dated 1564 was on the third kiosk (A. Führer and E. W. Smith, *The Sharqi Architecture of Jaunpur*, p. 17).
The History of the Muslims in India begins with a foray led by a plucky teenager of the tribe of Quraish. Muhammad bin Qasim landed the fleet sent by Hajjaj the Governor of Iraq at Daibul at the mouth of the Indus, and after defeating the Raja who had molested Arab trade with Ceylon, annexed the lower Sindh Valley on behalf of the Omayyad Caliph (AD 711–712). This was the fateful year in which Spain was being invaded in the Western extremity, while at the same time the frontiers of the Arab world were being pushed rapidly up into Central Asia. The young conqueror had the good sense to respect the natives’ rites, and gave orders for equitable taxation.

No vestige of the Arab occupation of the Sindh Valley stands above ground, but recent excavation has revealed many traces of it at a site now known as Bham bore (but which may conceivably be Daibul), situated about 40 miles east of Karachi on the northern bank of the Gharo Creek of the Arabian Sea. There are signs of the settlement coming to a sudden and violent end in the 12th or 13th century. Of the eight Kufic inscriptions so far found two give dates for the Mosque, AD 727(?) and AD 907. This Mosque measures 128 feet x 122 feet; it has a brick-paved courtyard 75 feet x 58 feet; on three sides of it were cloisters with two rows of pillars, and three rows on the west or sanctuary side where 33 pillar bases are discernible. Curiously, there is no sign of a mihrab in the qibla wall. This then is the earliest mosque built by the Muslims so far discovered in the Indo-Pakistan subcontinent.

The small Arab colony in Sindh could not have achieved anything spectacular localized as it was, and the intruders must have lived relatively peaceably with the natives. It was not until about the year 1000 that India had to fear alien depredations. Then out of the Afghan passes the Ghaznavid ruler Mahmud began his brigandage. Systematically, summer after summer his plunderers poured into the plains, despoiled the temples, reaped a harvest of treasures and were gone. Demonstrating his zeal by his iconoclasm, Mahmud exploited his lust for lucre, but cared little for colonization or conversion. It is claimed that Mahmud built a minar in the Fort at Lahore, and a mosque known locally as Khisti Masjid. The Ghaznavid Empire was brought to an end when in 1149 the Ghorid ruler Alaudin Husain came from the fort and town in the north at Firuzkoh which was completed in that year, and burnt, sacked, and plundered Ghazni in such a manner for seven days and nights that he earned the title ‘World Incendiary’. We have already had occasion to note that a pair of richly decorated and inscribed 70-foot minaret towers of stellate shafts on octagonal socles survived the sack. As is known from a traveller’s sketch in 1840, there was an upper cylindrical stage which raised one of the minarets to twice its present height, while the hollow interior had ill-preserved stairs. Mahmud’s own mausoleum is known to have been later defaced by Amir Chuban in 1325, but still existing is his white marble sarcophagus with a dated Naskhi inscription (1030, the earliest Naskhi on record) listing his titles and with a prayer for God’s mercy on the Sultan. The carved doors of sandalwood which were in the entrance to the garden leading to the tomb, were brought to India in 1842 and are now in the Agra Fort. One unidentified sarcophagus at Ghazni clearly reveals Indian influence in its decorative carving, but it is believed to be much later and contemporary with the Delhi Mosque. We know from Girdizi that there were 53,000 Hindu slaves in Ghazni in 1018, and from al-Utbi (c. 1020) that trees had been brought from Hind and Sindh, presumably on elephants. It was on his return to Ghazni in 1019 with a large number of elephants, plunder, and captives that Mahmud founded the Friday Mosque of Ghazni known as ‘the Celestial Bride’. From al-Utbi’s description we gather that the mosque was square with expansive porticoes which were
domed. The gates were lofty and projecting, the pavement was of white marble, and the wall surfaces were painted in lapis lazuli and gold like an enamelled garden. Mahmud built a college where students obtained a daily maintenance, and teachers a salary from its endowments. A covered passage led from the maqsura in the mosque to the palace to ensure the Sultan's privacy. Elsewhere al-Utbi refers to the fish ponds, the gold and silver ceilings of this palace, and a golden peacock preceding the throne whose slabs were joined with gold wire and silver nails. This must be the throne of gold and silver which Mahmud had built from the booty he had acquired in 1009. Al-Utbi says the nobility followed Mahmud's lead and erected mansions, mosques, gardens, reservoirs, and aqueducts. All this then must have perished in the Ghorid invasion, for when Ibn Battuta visited Ghazni in 1332 he found it a heap of ruins. We are lucky enough that the inscribed sarcophagus of Mahmud's father Subuktegin (d. 997) survives, and a mihrab with polychrome arch from the time of the Ghaznavid ruler Ibrahim (1059–99).

Recently, the local Museum has been enriched through clandestine digging at Ghazni. Marble slabs, some carved on both sides showing that they served as screens, depict figurative themes of considerable interest. There are guards armed with clubs standing within pointed horseshoes arcades with double-headed eagles in the spandrels; there are rows of dancing girls, an equestrian smiting a lion who has leaped on his horse, a mahout on an Indian elephant, and a slab with fabulous and hybrid creatures woven into a floral arabesque design. Systematic excavation carried on by an Italian mission in 1957–58 in the Ghaznavid palace (situating about 300 yards east of the minaret of Masud III) have uncovered further slabs with carvings of a vegetal nature together with inscriptions. The pavements here were of marble slabs or of brick mosaic, and there were also found carved stucco work with traces of colouring, as well as square glazed tiles with polychrome repoussé designs. Most astonishing of all was a white marble statue of a triple-headed Hindu god excavated in the northern sector of the palace. Girdizi records that the fragments taken by Mahmud to Ghazni from Somnath (in 1025) were placed in front of the gate of the Mosque, but al Biruni has a more detailed account of it. Similarly, Ibn Battuta says that near the eastern gate of the Jami Mosque in Delhi were two idols of copper connected together by stones. People trod on them while coming in and going out. Rashidaddin had already remarked that 'an idol is only fit to be used as a threshold upon which travellers may tread.' On the Muslim conquest of Ajmer in 1192 we know from Minhajuddin that five gold pinacles and two large gold humay 'each about the size of a large camel', were sent to the Ghorid ruler Ghiasuddin who set them up on his castle in Firuzkoh, as a trophy of victory.

Muhammad Ghor sent his Turcoman slave to subdue northern India. This man Kutubuddin defeated Prithvi Raj Chauhan in 1191, and founded a capital on this site, once the ancient city of Indrapat and henceforth to be known as Delhi. In 1195 Kutubuddin was appointed vicerey of the Muslim dominions in India. In commemoration of the event he set about erecting the 238-foot tower known as the Kutub Minar (1199). To the flanges of the Ghaznavid type of tower were added reeds, so that curved and angular members alternated round the central core containing a staircase (Plate 138). The shaft having tapered to a certain length, a balcony was corbelled out from it on an intricate system of oversailing pointed niches. The grey masonry was decorated with horizontal bands of closely articulated inscription on red sandstone. Kutubuddin's successor Ilutmish delegated his architect Amir Koh to continue the tower (1200–20), adding first a stage made up solely of reeds, and another above it solely of angular flanges. The fourth and fifth stages are a blot upon the structure, for they neither respect the verticality that was intended nor the warm patina of the materials employed. They were restored in 1369 after destruction by lightning, and Hindu architects Nana, Salha and two others have signed their names on the third balcony. The original battlements were replaced in 1828 by balustrades designed by Major Smith, whose addition of two further storeys were based on the false presumption that it once had seven. What there was in fact was a white marble cupola on the top with several golden balls around it according to Ibn Battuta.
and this domed lantern on the summit survived until Mughal times as depicted in a miniature. The taper is from 47 feet at the base to 9 feet at the summit. The fame of this minaret had carried far, and Abulfeda (d. 1331) was able to describe it fairly accurately as of red stone, polygonal in form, and ascended by a staircase of about 360 steps. We can safely say that there was little exaggeration in his statement that this minaret was unparalleled in the world.
Beside the minar, Kutabuddin had begun the Kuwvat-ul-Islam Mosque (1191–95) on the plinth of the Hindu temple of Rai Pithora (Prithvi Raj) (Figure 58). The cloister round the court, in which stands the iron pillar dedicated to Vishnu of the 3rd century AD,27 was simply a flat roof on archless supports, with corbelled domes over the entrance bay and in the sanctuary. The pillars were ornamented with Hindu designs, including bracelets, armlets, chaplets, garlands, link chains terminating in bell or tassel-rosettes, and the kirtimukha or 'glory face' from whose gaping mouth falls a festoon of pearls. The plaster coating that embalmed these columns appropriated from 27 temples28 has long since fallen off, and there is now nothing to distinguish the mosque from a temple but the well-proportioned screen of arches that was erected on the west front in 1197. The latter was meant to mask the makeshift construction, and to endow it with an appropriate Islamic accent. It was certainly worthy of the Minar scale but alas too grandiose for the now dilapidated peristyle prayer hall it sought to hide. The arches of the screen, three of which are over 50 feet high and eight more of half the size, have been constructed on the corbel principle: instead of the normal radially laid voussoirs, flat stone slabs resting on one another are cut into the arch form indicating that the work has been executed by Hindu masons. The same is true of the dome above the entrance which is corbelled, not vaulted, by means of overlapping courses of masonry assembled without cement. Here it is interesting to note that Marvazi refers to an 11th century Hindu who describes the Muslim mihrab as 'stones built and laid in tiers.'29 Arches and vaults constructed in this manner exert no lateral thrust, and the dead weight is carried vertically down. Since representations of Hindu gods here have not been defaced we may assume that they were originally disguised in stucco.30 In a parallel case when the Samanid Muslims re-used the gates of the Magian fire temple at Bokhara for the extension of their own Cathedral Mosque in 902, they are known to have erased the face of the idols without obliterating their bodies.31

At the Delhi Mosque even the arch screen betrays the Hindu touch in the border of meandering tendrils running up the flanks of the piers like beanstalks, and in their cabbage leaves which give the impression of breaking into a swirl of waves. In Itutmish's extension of the screen (1229) (he tripled the area of Kutubuddin's Mosque) which was intended to integrate the Mosque with the Minar, the Hindu carving has been deliberately excluded, so that the freehand impressionism has been replaced by patterns with an unmistakable tautness of line. The arches have nevertheless been constructed by the false method, and again their apices conclude in reversed curves, reminiscent of the ogee arches of Buddhist icon frames. The other early type was the foliated arch. It was introduced in the mihrab dated 1199 of the Ajmer Mosque, but at this time the lobes constituted no more than a wavy line, and the keystone cusp ended in the ogee peak. Another inscription, apart from that on the mihrab, states that the building was entrusted to the supervision of Abu Bakr of Herat in 1200, while two other inscriptions on the north minaret and on the central arch of the façade (Plate 139) each refer to the completion of the Mosque under Itutmish, i.e. between 1210-36. Above the central arch lopped-off stubs remain (Plate 140). This scheme of paired minarets above the portal links it with the Seljuk architecture of Anatolia, where the earliest example of it appears somewhat later in the same century. In this Mosque of Ajmer the flat ceiling is carved with popular Jain motifs such as lily pads, and the interior of domes with concentric rings of cusped patterns recessed one within the other (Plate 141). The roof of the aisle nearest the façade is flat, the next one to it has five small domes each covering a single bay, and over the sanctuary end are five large domes each covering the equivalent of nine bays, and each is carried on a set of columns forming an octagon. Although as many as three heavily moulded temple columns have to be stacked one on top of the other to reach the requisite height, the ceiling still falls short of the arch screen summit, and consequently the domes cannot be viewed from the court. Between the angles of the octagon and the rim of the dome are inserted flat slabs to cover the overhang.

The squinch niche appeared soon afterward in the Tomb of Itutmish (1235) (situated beside his
extension of the Delhi Mosque), though its back was filled up crudely, which is all the more conspicuous against the proliferated low relief carving of the walls, (Plate 142). Ilutmish had himself built a tomb in 1231 for his son Nasiruddin Mahmud (d. 1229) in Delhi at a place now known locally as Sultan Ghari (Figure 59). Within an enclosure wall which is on a 10 foot plinth with round corner towers covered with domes, is a courtyard containing an octagonal cell sunk in the centre of it. This is the mausoleum to which steps descend, while its roof supported on four central columns projects above the ground level.32

In Allaudin Khilji’s gateway to the Kutub enclosure, the Alai Darwaza (1311), the true arch exerting lateral thrust appears in India almost for the first time, and consequently has a normally pointed apex drawn from two centres. The pointed portal arch has a slightly horseshoe curve (Plate 143). Projecting from its intrados is a series of barbed knobs33 emulating a raised portcullis, but also suggesting a garland of buds.34 It was perhaps intended to combine the illusion of strength with the appearance of delicacy. But on the whole the effect of sharp-edged deep relief carving of the façade is cruel and cryptic, and seems to reflect the builder’s personality, for Amir Khusru writes in 1311 that in building the new fort at Delhi Allaudin followed the tradition of human sacrifice and slaughtered ‘some thousands of goat-bearded Mongols for the purpose.’35

Above the sumptuous sculpturing of trellises and inscriptions is a smooth dome terminating in a nipple-pinnacle. Here for the first time white marble is juxtaposed with red sandstone for defining the principal forms. The squinch carrying the dome is composed of a series of telescoping arches resting on the cornice line. Finally, it should be noted that the Alai Darwaza is a quadrifrontal archway of the Roman type, resembling the tetrapylon of Constantine in the Velabrum (306–37) with its two-storeyed niched façades. The Roman prototypes stood at the intersection of main streets and may have incidentally served as shelters to merchants.36 The main difference in the Alai Darwaza is that there are steps in the interior due to a rise in ground, and the egress façade is higher than the entrance. Allaudin Khilji had the megalomaniac ambition to dwarf the Kutub Minar by building one almost twice as large.37 The remains of his minaret (1310) in the Kutub enclosure has the prodigious circumference of 275 feet, and work on it has been discontinued at a height of 70 feet. Other instances of the abandonment of building schemes are known, and I may mention the Sahal Abad Palace of the Ghaznavid Subuktegin (977–997). After him his sons declined to undertake its completion, and it fell to ruins according to al-Utbi.38
The robust character of the next dynasty, the Tughlaks, is emphatically expressed in their architecture. Ghiyasuddin gave the order for the erection of the fourth city of Delhi in 1321. The Palace of Tughlakabad, situated on a high ridge of hills and covering 300 acres, was completed by 1323. Already by 1327 this city was abandoned by order of the eccentric Muhammad bin Tughlak (of whom Ibn Battuta has left us an unforgettable impression). Today its Citadel lies derelict in its ruins, and impressive only are the enormous fortifications. The granite ashlar walls filled in with loose rubble are up to 30 feet in thickness, defended by four tiers of loopholes pierced in battlements and galleries (two covered, one open). The walls rise on the side of the Citadel to a height of 98 feet, and are protected at the base with a talus. Below, a 600 foot long causeway on 27 arches stretches out over what was once a lake, and approaches a miniature fort built on an artificial escarpment. Within it lies the Tomb of Ghiyasuddin Tughlak (1325), (FIGURE 60) the body of the substructure with sloping sides is of red sandstone, while the dome is revetted with white marble—a material which is also used with discretion below to frame and outline the doors and windows. Some decorative relief is afforded to this stolid edifice by the pierced tympani above the doors, and the trilobed merlons constituting the parapet. A pot finial of exaggerated size lends weight and authority to the dome. If this feature was intended to be symbolical in this context it no doubt stood for revivification. Water jar finials are found carved on the rock face on Nabatean tombs of the 1st century AD in Arabia, and it is notable that in pre-Islamic poems referring to dead relations occur such an invocation as ‘May he be refreshed by drink.’

The batter of the walls is less aggressively militaristic when the building is of brick as in the Tomb of the saint Ruikn-i-Alam at Multan, built by the order of Ghiyasuddin Tughlak in 1324. The octagonal mausoleum with dome of 56 feet internal diameter is girded around by a high mock fortress having eight tapering round towers at the angles. They have a slope of 2.3 inches per foot. Sisu wood beams are let into the brickwork in horizontal bands. The crenellations, strings courses, and wall panels are adorned with carved terracotta and faience tiles inset on red brick in white, dark blue, and pale blue glazes.

The sixth city of Delhi built by Firozshah Tughlak in 1354 presents a sorry sight of tumbled ruins where once there were 18 palaces, 8 public mosques and many serais. Moreover, al-Qalqashandi wrote in 1411 that Delhi was populated for a circumference of 40 miles, and that there were in it 1000 madrasas, 70 hospitals called Dar ush-Shifa, and 200 asylums and hospices. In the Kotla or Citadel the only building that catches the eye is a three-terraced pyramid. The stages each have vaulted cells, but the core is solid and on it is a lat, a monolithic pillar of polished sandstone. This is one of Asoka’s pillars c. 250 bc weighing 27 tons, brought here from a considerable distance, and set up as a trophy on this structure especially erected for it. There was a globe surmounted by a crescent on the summit as reported by William Finch in 1611. Firozshah was an orthodox Sunni averse to all forms of luxury. His biographer Affi tells us that he prohibited the painting of portraits as contrary to the law, and directed that garden scenes should be painted in the private apartments of the palace instead. What is worse, Firozshah admits in his own Memoirs that he ordered pictures and portraits painted on doors and walls of palaces to be effaced. This indirectly gives us evidence for figurative wall painting in early Muslim India. We learn from the Tarikh-i-Firoz Shahi that this ruler built labyrinthine underground

**Figure 60 Delhi, Tomb of Ghiyasuddin Tughlak (Brown)**
chambers (as hot weather retreats). This was in a Fort he built in Delhi Province two years after the Bengal campaign. 'The central apartment under the palace was very dark and the passages very narrow, so that if the attendants did not guide the visitor he would never be able to find his way out.'

The pseudo-militaristic style is again very much in evidence in Firozshah's reign. The Kalan Masjid in Delhi (1387) built by the Prime Minister Jahan Khan has embattled parapets, and round angle buttresses extended into a feeble taper. It would seem that this mosque was not incapable of being defended during a crisis in a siege particularly as it was raised on a high basement storey. In the latter were shop chambers of double depth. The sanctuary hall is unusual in that it is surrounded by a corridor. Arches and domes here and henceforth are of the low four-centred outline. Another Tughlak building the Khirki Mosque c. 1387, built with undressed masses of schist embedded in hard cement and disguised by a coat of plaster (now black with age), is roofed with 89 domes leaving four small courtyards within for the purposes of lighting. Perhaps the best representative of this building period is the Tomb of Firuz Shah (1388), evidently built by his chief architect Malik Ghazi Shahna (PLATE 144). In it the surface finery and the water jar finial of Ghiyasuddin's Mausoleum are missing, whereas the projections are bolder, and the angle of the sloping walls infinitely more subtle. Add to that the fact that the octagonal drum rises into view at the expense of the domical height, and you have a building with unassumingly fine proportions. The approach gains in impressiveness by being heralded by a pair of stone railings, but the dome chamber loses in prominence by being annexed to a college wing. The canopy of this dome is decorated with carved plaster medallions circulating in the rays of a ribbed star—as if they were constellations revolving round the great sun in the centre (PLATE 145). All this ornamentation is coloured and stands out against a shining white stucco ground.

The violation of Delhi by Tamerlane in 1398 stilled architectural tradition in the capital for a third of a century. Those craftsmen who did not flee to the provinces were abducted in large numbers to Samarcand.48 When building activity was resumed the Sayyid dynasty harked back to a novel type of mausoleum which had been erected in 1369. This Tomb of Khan-i-Jahan Tilangani is walled up and overgrown with moss, but it is possible to see that it has been derived from the Qubbat-as-Sulaibiya at Samarra (862), itself an orientalized version of the Dome of the Rock. The domed mausoleum at Delhi is surrounded by open arcaded galleries on an octagonal plan. Its only Indian features are the sloping dripline eaves supported by modillion brackets and the lotus leaf finial. There are octagonal kiosks (a word deriving from the Persian-Turkish kushk) on its terrace whose function is to grade the composition. Six octagonal domed kiosks appear on the terrace of the Tomb of Mubarak Sayyid (1434), their eaves and lintels supported by three-way brackets. A lantern surmounts the flat-headed dome.49 From the battlemented base of the dome rise a dozen stone pinnacles intended to be buds and known as guldastas. They may have been survivals of grave-markers, cairns50 or turbanned headstones. In the Tomb of Muhammad Sayyid (1444) the drum and the dome are both raised higher, but since there were no clerestory penetrations in the drum, the canopy of the dome was left in impenetrable darkness.

There was a late survival of the mausoleum with octagonal verandas when the Sur ruler Sher Shah's Mausoleum was erected (1540) at Sasaram in Bihar. Here a further range of kiosks was added to pyramidize the composition (FIGURE 61). This building of fine chunar sandstone has a dome 71 feet in diameter and rises to a height of 50 metres. It is contained in a battlemented and turretted enclosure, and the whole is set in a tank about 1400 feet square to which steps descend. The ramp approaching a tomb on an artificial fortified island was an idea evidently copied from Ghiyasuddin Tughlak's Tomb.51 This had then been adapted by Sultan Zainul-Abidin (1420–70) in Kashmir. He had made a stone foundation 200 gaz square and 10 gaz high in the middle of Ulur Lake, erected a charming palace on it, and planted a grove of trees.52 Sher Shah's Tomb is claimed to have been built by the Lodi architect Aliwal Khan, and there are two such contemporary buildings of this category.
at the Delhi capital—the Tombs of Isa Khan (1547) and Adham Khan (1560). But the Lodis built their mausolea more usually in the form of domed cubes. The façades were endowed with punctuations and scale by means of string courses and blind storiations (PLATE 146). A fine example is the Tomb of Bare Khan at Delhi. A date for it is suggested by a similar building at Sarhind known to be the Mausoleum of Princess Subhan, daughter of Sultan Bahlol Lodi (1497–8).

The Lodi mosque sanctuary was a simple symmetrical one with five arches and triple dome, as at the mosque known as Bara Gunbad (1494) at Delhi. The central arch is emphasized by being thrice circumscribed, though all the arches are extremely wide and keel-shaped. The central dome on the other hand is lifted only a little higher than its mates. The Moth-ki-Masjid (1505) spaces out the domes while giving precedence to the central one, and makes the central arch into a lofty entrance way. The double storeyed open turrets attached to the rear angles appear to be there only for those who wish to enjoy the cool air. The domes are carried on a succession of oversailing lintels carved with niches simulating mukarnas. In the same general form is the Jamala Masjid (1536) with its perfectly synchronized parts. There are carved circular bosses in the spandrels, an oriel balcony on the entrance tympanum, long torus bundles reinforcing the portal ends, and a succession of sunken rectangular plaques serving as the parapet. The Black Mosque (Masjid-i-Kuhna) (1545) in the Old Fort at Delhi could only excel its predecessor in ornament consisting of polychrome marble mosaics in the entrance tympanum and above the mihrab, and in the chasteness of its ashlar (PLATES 147–48). This mosque was the work of Sher Shah, that same intrepid Afghan who defied the Mughal conquerors. But before I go on to tell of the Mughals, I shall break off here and briefly survey the state of architecture in the major Muslim provinces independent of the Imperial yoke.

Bengal

Although Bengal was annexed to the Delhi Sultanate in 1202, Indo-Muslim architecture in this province remained on an obscure level until it became independent in 1338, and Ilyas Shah established his dynasty with Hazrat Pandua as capital. It was his son Sikandar Shah who built the Adina Mosque in Pandua in 1375 on the plan and scale (507 feet x 285 feet) of the Great Mosque of Damascus (530 feet x 320 feet). Following an Omayyad precedent the walls and piers were composed of stone (though here over a brick core), and the vaults and arches of fired brick. As at Damascus the arcades on the qibla side were interrupted in their middle by a transept which bored through to the mihrab, though here it was roofed with a pointed barrel vault, now fallen. The trilobed mihrab niche has the silhouette of a head with projecting lobes; the type in fact that had served to frame the images of Buddha. Besides the
dapper pillars with consoled capitals and ruffled foliage, there is little else of Hindu origin to be found in the mihrab, especially not the representations of hanging lamps within its concave niche. The three-pointed crown of foliage carved in low relief above the mihrab is related to those which occurred over mihrabs and entrances in later years in Ottoman Turkey, though they are anticipated by the crowns worn by kings in Islamic miniatures. A platform raised 8 feet above the ground and covering a space of eighteen bays to the right of the sanctuary at the Adina Mosque served as a prayer dais for royalty. The brick arches of the prayer halls (five-aisles deep on the sanctuary side and three aisles on the remaining sides) spring four ways from black hornblende piers. Each of the bays was domed independently on simple spherical pendentives of corbelled bricks. Even more than the later Ottoman domes these are so low that though there were once over 300 of them here, they contribute little or nothing to the exterior effect. Continuous domical vaulting on low horizontal substructures became a characteristic of the Bengal mosque style. Finally, the tympani of arches over the numerous mihrabs in the qibla wall of the Adina Mosque have elaborate carved terracotta ornament.

There is a minar at Chota Pandua attributed to pre-Ilyas Shahi days, c. 1300, which has a general resemblance with the Malwiya in Samarra. But while it has no external ramp there are five successively diminishing tapered cylinders, measuring 60 feet diameter at the base to 15 feet at the top. The three lowest stages are reeded. There also exists a freestanding minar at Gaur (then Lakhnauti) built by Saifuddin Firoz c. 1490. It is 12-sided, and stands on a mound reached by stairs. At the Sath Gunbad at Bagerhat built by Khan Jehan (d. 1409) the two towers engaged at the corners of the front façade serve as minarets. They have stairs and are covered with domed turrets. Over the prayer hall are 77 domes.

Already there had been an attempt to build a massive dome. This was at the Eklakhi Mausoleum in Hazrat Pandua (Plate 149), the tomb of Jalaluddin Muhammad Shah (1415–32). Although the exterior is a square, the interior of the chamber is an octagon (as if from a safety-first measure), and the dome of 48 feet diameter rests on this and on walls 13 feet thick. Here glazed tiles and a curved cornice appear. The latter must have been suggested by bamboo construction, for Abul Fazl confirms that the domestic houses of Bengal were of bamboo and some of them were both expensive and long-lasting. Translated into masonry their only function was to shed the heavy rainwater of the Monsoons.

From the Husain Shahi period (after 1493) there are three notable mosques at Gaur, one of which is the Lattan Masjid with faience decoration. The Chota Sona Masjid, built by Wali Muhammad (1493–1519) has a stone-faced façade of five cusped arches, and five corresponding mihrabs as well as a smaller one in a mezzanine gallery. There are three rows of domes, though in the middle, where the transept may have been, there are three successive curved 4-sided roofs, known locally as chauchala and probably designed after thatched huts. Lastly, the Bara Sona Masjid built by Sultan Nasrat Shah in 1526, the façade of the 11-bayed narthex again has the tensile cornice, but the carved stone and terracotta of this time and later are too minute and uninspired.

Jaunpur

In 1394 Muhammad Tughlak sent his chief eunuch Malik Sarvar to be governor of the frontier provinces of the East, with the title Malik-as-Sharq. The governor became independent and founded the Sharqi dynasty whose capital was at Jaunpur. As if through sheer endeavour to be different the Sharqi rulers built such towering portals to their mosque façades that the dome itself could only be viewed from the rear, thus giving the building a double face—rectangular on the one side and hemispherical on the other. In the mosque known as Atala Masjid, begun by Firuz Tughlak in 1364 but rebuilt by Sultan Ibrahim after 1408 (and employing Hindu materials for which there are Sanskrit inscriptions of 1376, 1378, 1407, and 1408), the rear angles of the qibla wall are engaged with three-quarter round buttress towers of extremely tapering shape with smaller paired buttresses of the same form denoting on the
exterior the position of the three mihrabs. The main portal arch of the sanctuary is flanked by pylons of a colossal order that taper 3 feet in a height of 75 feet. Horizontal mouldings divide these pylons into panels each containing a blind bud-fringed arch. The back wall of the main portal is also storiated in its tympanum with pierced clerestories. Below this is a tall entrance whose arch-head appears to rest on a lintel supported by wall brackets. This pylon-portal is repeated in miniature on the flanks of the sanctuary façade, where once more a view of the two domes, which are situated before the flanking mihrabs, is blocked out. The porticoes around the court (interrupted by three gates on the axes) are hypostyle, that is the roof beams rest directly on piers, which are here carved with indigenous motifs.

In the Jami Masjid of Jaunpur built by Husain Shah (1470), the courtyard galleries are raised on a basement storey, and in place of the lateral domes of the sanctuary are great pointed barrel vaults, 44 feet high, supported by cross arches. These, however, do not abut against the central dome though they rise as high as its base. The space between the flanking vaults and the dome is occupied by two-storeyed zenana galleries covered by panelled flat roofs, while the domed chamber itself has a circumambulating first floor corridor through the thickness of its walls. Islamization of ornament is well under way. On the sanctuary façade are interlaced and stellar pattern grilles, borders of bifurcating leaves, and stepped lozenge diapers, though Indian brackets with nipplependants hang in clusters and cushion the capitals.

Gujarat

Nowhere did sheer virtuosity with the chisel achieve such proliferation as in the province of Gujarat which obtained its independence from the Delhi Government in 1396, and retained it till the reconquest in 1572. The Jami Masjid at Broach, a seaport on the Arabian Sea conquered by Allaudin Khilji, was built, it would seem from an inscription on the gateway, during the reign of Ghiyasuddin Tughlak in 1321/3. As at Ajmer its coffered masonry ceiling is carved into intricate and exciting kaleidoscopic patterns, including polyfoil lotuses and rosettes in various combinations that overlap, circumscribe, or suggest infinite layeration and gradation of shade. There are three mihrabs, and the roof of the prayer hall consists of three major and ten minor domes.

The first triumphal arch composed of a large opening flanked by two subsidiary ones, first makes its appearance at the Jami Masjid of Cambay (1325). The rectangular fronton raised above the level of the lateral wings became the basic scheme of the Gujarat style. Like its successors the galleries at Cambay are covered by a number of inconspicuous domes, though unlike them it has the good sense to camouflage its chaotic supports behind a trellis grille. Another characteristic feature first appears in the Masjid of Hilal Khan at Dholka (1333). Two repetitively moulded minarets are appended above the sanctuary portal like sudden afterthoughts. In Alif Khan’s Masjid at Dholka they appear as square towers engaged to the façade which conclude in turreted cupolas. There is complete exclusion of Hindu feeling in this mosque which has three domes rising from high walls. The transition devices consist of four corner squinch arches, together with 8 groined pendentives in the same zone, to form a hexadecagonal base for each of the three domes. At the Tomb of Darya Khan, Ahmadabad (1453), the funerary chamber is converted into an irregular octagon by means of conoid squinches, and still further reduced into a 16-sided zone by means of larger arches resting on the squinches and alternating with smaller framed niches. This further becomes a tall cylindrical drum with a diameter of 50 feet. An ambulatory of 16 domed bays surrounds the chamber and each bay opens by an arch onto the exterior. In the Tomb of Mubarak Sayyid near Mahmudabad (1485), the domed chamber, with four kiosks on its roof, is surrounded by a doubledepth arcaded corridor of domed bays which is approached on one side by a kiosk-crowned entrance porch. These monuments contrast strongly with the Tanka Masjid of Dholka (1361), whose reused pillar shafts are carved with flocks of geese and rows of dancers, and bracket capitals with supporting pot-bellied demons, all of which have now re-emerged from layers of plaster. Further west at Thatta in Sindh the Tomb of one of its earliest rulers, Jam Nizamuddin (d. 1508).
seems likewise to have employed local sculptors, in this instance of the Sammah dynasty, as is evident from the incongruous carvings on the exterior of the qibla wall, which include a string course of migrant geese (Sanskrit, hamsa). Inside, the transition to the dome, now fallen, commences at a low level and consists of flat slabs on corbels across the corners with masonry fanned upwards to meet the squinch arches, while a further register of framed flat squinches rises above.

After Cambay and Dholka the focus shifts to the new capital Ahmadabad founded by Ahmad Shah Begarha in 1411. Here the Mosque of Sayyid Alam (1412) repeats the Cambay scheme, though leaves the ugly device of column atop column of the interior exposed to view. The flanking piers of the central portal are pummelled by Hindu sculptors into a succession of mock balcony, bracket, and pillar reliefs. Once again in Ahmad Shah's Jami Masjid of Ahmadabad (1423) the plastic treatment of the salients makes it alien to the rest of the façade. This front elevation is composed as a triple arched triumphal gate with extended wings on either side, so that the eye, starting boldly from the centre, steps down twice before coming to the broad sweep of the peristylar flanks (Plate 150). Unfortunately, no attempt has been made to reconcile the superb arch screen with the garrulous interior where truncatedolithic struts are propped one above another like rivetted scaffolding. The mihrab is adorned with coloured stones forming an open flower. Over the portal were two mysteriously swaying minarets which swayed more than they were intended to, and fell. These were sketched some 38 years before their destruction, and by comparing them with the relatively simplified minarets of the Jami Masjid at Champaner built by Mahmud Bigarah in 1508/9, we can see how distracting they must have been. In both mosques an enclosure partitioned by perforated lattices is set apart on the right side as the prayer hall for royalty. As at Ahmadabad, the sanctuary at Champaner is covered with a number of domes of the nine-bay and single bay size, but while at the former the low corbelled dome behind the main entrance arch has to be raised on four sets of super posed columns to reach the crest of the portal, at Champaner the endeavour to raise the central dome to the requisite height has been avoided, and this dome is placed over the heart of the sanctuary so that the most noble vantage from which the Mosque may be viewed is the rear. At Ahmadabad the second tier of columns carries a gallery that surrounds on three sides the three domes that lie immediately behind the arch screen at a higher level than the remaining building. The gallery is reached by means of stairs embedded in the piers of the central portal. The middle dome is treated as a lantern admitting a crown of light upon the devotee entering the sanctuary.

This structural form was soon adapted in the baoli or underground stepped pleasure wells erected in Gujarat. At Adalaj 12 miles north of Ahmadabad a Sanskrit inscription dated 1502 states that Ruja, Virasimha's queen, constructed this well in Mahmud's reign. The monument must be claimed as a Hindu one since a frieze over a door is carved with the Navagraha or figures of the Hindu planetary deities. A similar stepped well (baoli) exists at Asarwa near Ahmadabad. This is Bai Harir's Wav, a chief attendant of the harem of Mahmud Shah Begarha. A Sanskrit inscription gives the date of the well as 1499 and an Arabic one 1500. Its entrance is marked by an open domed kiosk, and from it successive underground flights of steps followed by several landings with profusely carved hypostyle galleries are set out on a single axis. The last of these has an octagonal skylight and is four storeys in depth. The disposition is such that one can choose to recline in the hot afternoons on whichever stage rose above the level of the water. Should the baoli 300 yards away known as Mata Bhavani really go back to a Solanki ruler (1063–93) as it has been thought possible, then the pleasure well must be regarded as a native idea adopted by Muslim rulers. The author of the Arthasastra advises that the royal housekeeper should construct a square well with an underground chamber three storeys high, but he does not elucidate the purpose of the structure. At any rate the remains of two big stepped wells survive at Tughalkabad dating from 1321–23.

Gujarat arrived at the summit of its achievement when it ceased straining to make simultaneous concessions to two irreconcilable modes of building. In 1505 the little Mosque of Rani Sipari (wife of Mahmud Shah Sultan) at Ahmadabad,
swung over in favour of the Hindu style, with static construction, repeated endorsement of the horizontal principle, and treatment of mouldings in a plastic and atomized way. There being no true centre in the composition (Plate 151), the minarets are pushed out to the extremities of the façade. They rise from engaged complex piers to the height of the roof, and then resume extremely attenuated. The sharp flat slab pillars, the low pitched cross-cut eaves, the unobtrusive finialled domes, and the immaculate oriel balconies have been assembled into a design embodying elegance and grace.

The Sidi Sayyid's Mosque (1515) likewise went unfettered and displayed its essentially Muslim character. The sanctuary wall of this unpretentious arcuate structure is ablaze with the light entering through perforated grilles contained in the arch lunettes. The two end windows exhibit a number of conventionalized floral and geometrical motifs, but those flanking the centre are patterned with rank arboreal stems that branch from a bending trunk and scroll away or floriate till every inch of void is vigorously but delicately filled. Crowning the composition like some enigmatic emblem is the straight trunk and fronds of a parasitic palm (Plate 152).

It is instructive that in the third quarter of the 15th century the ruler of Multan, Husain Langa, sent a man to Gujarat to inspect its splendid buildings, but the emissary returned and confessed that with all his wealth, the Sultan could not hope to emulate them in his own city.60

Malwa

The province of Malwa ruled by three Pathan dynasties from 1389–1555 never had the struggle to extirpate native influence, partly because the indigenous element was already weak in this region, and partly because of the continued close association of this province with Delhi. The Jami Masjid of Mandu completed by Mahmud Khilji (1440–54), is impeccable in its adherence to the Muslim formula, with its multiplicity of small domes over bays surrounding the court. Large stilted domes occur over the projecting entrance porch (which is raised on a basement story), over the mihrab, and over the left and right extremities of the main prayer hall. Under each of the large lateral domes are platforms elevated on groined vaults, one of which it seems is set apart for women and the other for royalty. The builder's tomb known under the later name of Hoshang Shah lies in its own court behind the Mosque (Plate 153). Its only claim to notice here is that it would rank as the first Indo-Muslim building to be completely covered with white marble could we be certain that it was not revetted later by the Mughals, some of whose master builders indeed paid a visit here as recorded in an inscription on the building.

A more interesting structure at Mandu is the Hindola Mahal (late 15th century), which may have been an audience-hall. This is suggested by the cruciform corridors in the T-form extension of the principal hall, for here the point of intersection may have served as the throne chamber. It is also conceivable that the transverse arches of the broad hall preceding the throne room carried a succession of transverse barrel vaults, as for instance at the Khan Ortama at Baghdad (1356). Though the vaults have disappeared the excessively sturdy walls bid fair to outlast the centuries, and indeed, the deep gaps between their battering buttresses give an impression not unlike the sluice-ways of a dam. This may be a fanciful suggestion (Plate 154), but the Jahaz Mahal (1460?) or Palace of the Ship,61 situated nearby on the side of a lake, is so named precisely because its long substructure with domed pavilions on the terrace resembles a high floating hull with cabins on the deck and a captain's bridge overhanging the middle (Plate 155). On the terrace is an open-air bath, and on the ground floor a swimming pool of fanciful design with tri-apsed ends and concave sides. Nearby are taikhanas or hot-weather retreats, consisting of subterranean passages communicating with vaulted rooms disposed around the open shaft of a well. One passage bores through onto the lake at the edge of which is a view pavilion.

Mandu is now situated off the beaten track on an irregular plateau, whose whole perimeter of 38 miles is surrounded by a wall with ten gateways.62 It was founded by Alp Khan in 1398–1401. The main approach is through a ravine—the road
winding through a succession of fortified gates as it ascends. Memorial tombs are scattered over a dozen miles in the vicinity, and though they are for the most part scarred and blackened, the more imposing durbars, hamams, harems, and reservoirs, have been spared from times, dank fingers, and provide many enticements to both the lay and professional explorer.

**Deccan**

Although separated from the capital by 1000 miles, the Deccan region was partly populated by the residents of Delhi who were expelled by the maniac Muhammad Tughlak. A mosque surviving from a time prior to this is of some interest despite the fact that it employs Hindu spoils and its only remarkable feature is a clerestory above the roof. This is Malik Karimuddin’s Mosque, built by this Governor of Bijapur in the name of Allaudin Khalji. An inscription in Marathi dated 1320 has the revealing statement that (a Hindu) Revaiya, the carpenter, constructed it. Chief among the emigrants was a native of Persia who founded there the Bahmani dynasty in 1347. The architecture of this province, therefore, bears a strong affinity with some of the buildings of Iran. This, however, is not at all apparent in the Jami Masjid of Gulbarga (1367), built by a Qazvin architect named Rafi under Muhammad Shah I (1358–75). The plan is, in fact, unique, for there is no court and the whole prayer hall providing accommodation for 5000 worshippers is covered by a number of vaults and domes (FIGURE 62). To be precise, there are 75 small domes, with four larger domes four times their size at the corners of the mosque, and a still larger one of the nine-bay size in front of the mihrab—the latter being raised on a square substructure high above the roof level. Light reaches the interior of the sanctuary from open arcades that form three façades of the edifice. These arcades are deepened into short pointed barrel vaults that appear to form a cordon around the oratory of domed bays whose thrust they sustained (PLATE 156).

According to Ferishta, Ahmad Shah Wali’s fort (1429–32) was built by architects and engineers of various countries. It was rebuilt in 1461–3 and repaired in 1618, when battlements were adapted for musketry, though the inner Sharga Darwaza is from an intermediate date (1503). This gate has a domed and vaulted naqqar khana or music gallery upstairs with a projecting latticed bay on corbels, from where martial music was played at each watch. Rampant lions are carved in relief on the spandrels of the entrance arch. The Mandu Gate of the Citadel is cleverly contrived. The approach is by a winding and ascending tunnel that passes under it, while in the pavement of the tower was an opening for attacking the unsuspecting besiegers. There are altogether seven gates and many bastions along the ramparts that form a circuit of two and a half miles. The walls of laterite rock and trap are in places as much as 50 feet thick. An unusual feature is the wide rock-cut moat with a pair of partition walls making it into a triple moat 30 feet deep and 115 feet wide (PLATE 157). The triple moat is an Indian idea, for the specifications of a city in Buddhist literature refers
to such a structure, 'one containing water, the second mud, and the third dry.' Nevertheless the triple ditch was also to be found among the Greeks, for example at Syrinx in Hycania at the time of Antiochus III. Philo of Byzantium directs that a fortification should be safeguarded externally by not less than three ditches. Dams and sluices at Bidar allowed the water to flow to the portions resisting the siege at a specific moment. Particularly imposing is the Kalyani Burj, with its innumerable box machicolations, range upon range of bastions at successive levels, with broad loop-holes for muskets cut into the crenellations of pointed form. At Bidar the loop-holes in the merlons are so contrived that they diverge into two thus providing both forward and downward fire. Moreover, Bidar Town has its own range of fortifications in the nature of a three mile circuit of bastioned walls with imposing gateways, a moat, and a continuous rampart walk. The portion of the wall that joins the town with the citadel is deliberately made thin so as to isolate the one from the other should an emergency arise. The 6½ miles of curtain wall at Bijapur with 96 semicircular and polygonal bastions is generally held to have been completed in 1665, but the building inscriptions on towers stretch over a long period. Wall thicknesses up to 35 feet were obtained by ramming an earth core between stone facings. This resulted also in a wide wall-walk, which reminds us that the wall of the Il-Khan city of Sultaniya (105-13) was broad enough for four horsemen to ride abreast. The gates at Bijapur were, as was normal, approached by drawbridges over the moat. Some of these gates were defended by barbicans, and others by means of well placed guard-recesses and chambers concealed in the turning passages within the thickness of the walls.

In the buildings of Bidar the influence of Persia is more readily evident than at Gulbarga. At the Madrasa of Mahmud Gawan (1472), who was minister, scholar, and general, and hailed from Gilan on the Caspian shore, there are four axial ivans linked by three-storeyed arcades behind which are dwelling cells for students in the Persian manner. Comparatively small bulbous domes on high cylindrical drums rise over pentagonal towers projecting out of the body of the building at the ends of the ivans. Flanking the ivans on the ground floor are barrel vaults of the Gulbarga type, though instead of avoiding the difficult intersection of vaults at the corners by the use of large domes, here are suites of nine rooms on the cross-inscribed square plan. The entrance façade of the madrasa has on one flank an engaged cylindrical three-storeyed faience minaret with galleries carried on cavetto cornices.

Once more Persian influence is apparent in the Tomb of Ahmad Shah al-Wali Bahmani (1436) just outside Bidar, where the wall paintings have been executed by Shukrullah of Qazvin. Gold inscriptions painted on vermilion grounds are confronted and reversed in woven medallions, while mincing vine-arabesques are radially composed in serrated cartouches. Further colour in the architecture of Bidar is provided by the square painted tiles on the dado of the ruined audience hall at Gagan Mahal.

The domed chambers of Bidar Tombs, such as that of Mahmud Shah (1518) are closely comparable with their contemporaries at Delhi. Their onerous and oppressive domes were in turn adopted by the Adil Shahis when they seceded and established themselves at Bijapur in 1490. The mausoleum of Mahmud Adil Shah, the Gol Gunbad (c. 1656), may have been built by his architect Malik Yakut of Dabul (d. 1659/60). It is a great domed cube 198 feet high with perforated storiated towers at the angles. The design of these towers (Plate 158) appears to have been based on the four minarets of the Char Minar at Hyderabad, which was erected at the main road intersections of the new city in 1592. The elaborately bracketed gallery at cornice level also seems to have been adopted from the same source, but at Bijapur it somewhat disrupts the organic connection between chamber and superstructure. The battlement motifs and the lotus-leaf corolla at the base of the dome further tend to segment the building.

The fame of this building derives from its actual and not its seeming size, and the dimensions as seen in print are far more impressive than when translated into reality. The internal diameter of the dome nearly rivals that of the St. Peter's (173½ feet) and the Pantheon (142½ feet) in Rome as well as the Cathedral of Florence (138 feet), while
outstripping St. Paul’s in London (112 feet) and Sta. Sophia of Constantinople (107 feet). Excepting the Pantheon, it is not as high above the floor as any of these, but on the other hand it ranks as the dome that spans the largest uninterrupted floor space in the world (i.e. 15,833 square feet). The mean thickness of the brick dome set in thick mortar is $9\frac{3}{4}$ feet while its internal diameter is 124 feet. This implies that it has nearly double the diameter necessary for converting resonance into echo, and there is a whispering gallery designed specially for this purpose. The gloomy interior with a pentagonal mihrab projecting outside, (FIGURE 63) just enables you to discern the pendentive device for carrying the dome, but as this type had already appeared in the Jami Masjid of Bijapur (c. 1576) it is there that we should examine them now. The prayer hall is covered by 36 small domes of flat crown, together with one commanding dome of the nine-bay size (PLATE 159). In the latter four wide arches are thrown across the corners of the bay so that they intersect each other in the zone of transition, and the interspaces of the arched ribs are filled in with spherical segments. Above each pair of intersections one side of the octagon is formed. A cornice projection settles the discrepancies between the octagonal transition and the base of the dome. The whole arrangement can be recognized as an intelligent adaptation of the Iranian kite-shaped groin pendentives here carried to the ground, thus bearing the load of the dome inward and countering its outward thrust. The effect of the prayer hall is chaste and satisfying (PLATE 160).

At Bijapur the arcaded type of mausoleum was represented in the Tomb or Rauza with adjacent Mosque of Ibrahim Adil Shah II built by order of his wife Taj Sultana and completed according to the chronogram in 1626 by the architect Malik Sandal. The verandah arcades form a square plan (PLATE 161), and not an octagonal one as at Delhi. Visually the building divides itself into three zones: the arcaded ambulatory below surrounding the mortuary chamber, the solid volume of the dome above ‘paged’ by corner appendage minars, and a median zone composed of multiple brackets and jostling crenellations, both of which, aided by the cave, establish a strong horizontal emphasis. The globular dome is double, and the ceiling of the inner dome rises only as high as the crenellations. It is terminated by a water jar finial crowned by a crescent, and is garnished with a supporting calyx around its base.

While the Provinces were clarifying their separate ideals, the Imperial government was being wrested from the Lodi Afghans by Babar, a MUGHAL adventurer from Turkestan (1526), and a sixth-generation descendant of Timur. Babar had little time to acclimatize himself to the strange sights of India. This led him to accuse the Hindus of having ‘no skill or knowledge in the design of architecture’. However unjust he may have been, he was right at least in assuming that a whole world lay between the architectural values of the Hindu and Muslim. In brief, the Muslim mosque promoting joint social worship of an intelligible God, did all it could to keep the air flowing freely and light from the skies streaming in. Whereas the Hindu temple designed for private worship and for propitiation of idol deities, aspired to dim interior shrines brooding with the mystery of midnight shades. The austere formalism of the Muslim mind revelled in abstract lines, imaginative colours, flat forms, and plane surfaces. As compared with this the Hindu preference was for
all that was plastic, massy, concrete, and natural. Abdar Razzak of Herat, for example, was fully conscious of this, for in 1443 he described the figures of animals represented along the bazaar avenue at Hindu Vijayanagar as ‘so well drawn, and their movements have so natural an appearance, that you would think these animals were alive.’ By and large, Muslim art sought after the impersonal, the general, and the lyrical, whereas Hindu art at its best moments excelled in individualizing, in defining particulars, and in being relatively literal. No wonder Babar was so supercilious in his tastes. Unfortunately, now little remains to show the nature of his own preference in building, but from his Memoirs we know that he built a grand talar or open pillared hall in front of the stone palace at Agra, also the pool and the enclosure wall. He built the domestic apartments and their gardens and baths, and in 1626 a stepped well three storeys deep of which he has left a good description. His most enduring contribution to his successors was in the sphere of landscape gardening. The formal character of garden layouts together with axially disposed pools, platforms, subdivided plots and talar pavilions continued to bear the impress of the man who introduced them into India.

After the passing of Babar in 1530 the Afghans proved that they still had a spark of fight left in them. Under Sher Shah they reconquered India for a spell, and compelled Humayun to seek refuge at the Persian court. Humayun’s visit to the Court of Shah Tahmasp in Persia in 1544 had important consequences for the history of art in Muslim India. We know from the treatise of Kadi Ahmad (c. 1606) that the calligraphers Mir Mansur of Astarabad and Mirza Husain left for India with Humayun, the latter becoming a secretary of the sovereign. At the promise of a considerable reward two famous painters and portraitists Mir Musavvir of Badakshan and his son Mir Sayyid Ali, also emigrated to the court of Humayun. Other migrant calligraphers followed, as well as a pupil of the great Master Bihzad by the name of Dust-i-Divani, who made ‘much progress there.’ According to Abul Fazl the Shirazi painter Abdus Samad accepted Humayun’s invitation and went to India in 1549 where he became an art teacher. His Hindu pupil Daswanth became the pre-eminent painter of his age.

We are indebted to Khondamir (d. 1534) for a description of three of Humayun’s buildings. The first was a portable prefabricated palace of wood three storeys high on multi-coloured columns and a golden dome, which could be carried about on his journeys; the second was a royal pleasure barge on the Jumna in which four boats each with elegant two-storey kiosks were connected by means of covered passages leaving an octagonal pool in the centre; and the third was a palace with subterranean reservoir and passages leading to rooms and apartments. The reservoir could be flooded to cool the surrounding rooms. This was a three-part building, and it seems likely it is the three-part Talisman Palace described by Gulbadan Begum (daughter of Babar) who says that one was the House of Dominion containing military appurtenances, another the House of Fortune containing a library of picture books and manuscripts, and the third having a gilded bedstead in an alcove.

Humayun longed to live in an easy epicurean fashion, but so long as the Indian subcontinent seethed with a hundred hostile rulers he knew his task was to struggle on till the end of his days. But it is less well known that the great Akbar had also to wage war for some twenty years of his life before he could enjoy the fruits of peace. One by one he subdued the outlying Muslim provinces, and consolidated the nation as no other had done since the time of Asoka. Social reforms were imposed for uplifting the rural population, and for the first time in centuries some measure of stability was restored, though at the expense of compromising the faith of his forefathers.

The vast complex of Fatehpur Sikri built on a ridge of hills 26 miles from Agra (1568-75, vacated 1585) served as the proving ground for the ferments that inhabited Akbar’s mind (figure 64). For here in numerous domestic, ceremonial and religious buildings—flat, sharp, and edgy, with domed and pinpointed skylines, it is possible to discern the two main traditions vying to leave their impress. The types of buildings, their layout and individual plans, and their constructional features are largely Indo-Muslim, but at the same time a
number of indigenous themes and motifs occur. The entrance of the so-called Jodh Bai’s Palace (but likely to be that of Akbar himself\textsuperscript{86}), adopts the bud-fringed arch, though imposes an elaborately bracketed lintel door. The merlons on the parapet are engraved in flat relief as in the Delhi mausolea. In the galleried courtyard the trabeate scheme becomes apparent in the dripstones, lintels and brackets, and together with these it is claimed were images of Hindu gods.\textsuperscript{87} There is a Hawa Mahal or a two-storeyed wind palace with latticed walls projecting outside the court. Domes over the corners and kiosks on the terrace display immaculate taste. This sense of good proportion is equally evident in Raja Birbal’s mansion dated by a Hindu inscription equivalent to 1571–2. The stepped expanding brackets with their pendant bosses are elaborations of those that had appeared earlier at Jaunpur. The upper two chambers are ornamented with blind arches in panels and covered by a pair of low domes on octagonal drums—their carved lotus leaf finials endowing them with slightly reversed curve peaks. This house consists of four rooms below with a pair of oblong entrance porches covered with ridged roofs, and with pairs of terraces and rooms above reached by intra-mural stairs.

The private Audience Chamber of Akbar, the Divan-i-Khas altogether dispenses with arches, and the sunlit eaves with their shadowy undersides serve as the main accentuation of an otherwise undistinguished cubic block. A dramatic skyline is attained by four over-large kiosks on the corners of the terrace. Again the chiselling is neat and the surfaces are smoothly planed. And again the colour of the sandstone is a congealed corpuscular red which has the effect of instilling lassitude. The interior of this Divan-i-Khas contains an astonishing feature. From the centre of the chamber rises a carven pillar which mushrooms into a gigantic capital consisting of a cluster of horned volutes. These expand on all sides as they rise (Plate 162) until a sufficiently wide circumference is obtained. This serves as a dais for the monarch’s throne. From it four aerial bridges cross to the corners of the room and communicate with the staircases concealed in the walls. Though the pendulous members are reminiscent of the milk-sack of a cow—an animal highly revered by Akbar—the undulating members recall a serpent which in Hindu art was often represented with a multiple head. Since Akbar had evinced an interest in the Hindu scriptures and subsequently had them translated from the Sanskrit, it would seem that the idea of this throne capital was derived from that source.\textsuperscript{88} According to the Mahabharata (Adiparvan XI-XIII) the King Gaurumukha had a palace built resting on one pillar, and seated himself on this in order to escape the vengeance of the Naga Takshaka. Moreover, he continued to give audience from here for a week until he fell victim to the strategems of that snake. A snake-capital may have been used even then, as it was a widely prevalent practice in ancient times to dispel an evil presence by making an image of it.\textsuperscript{89} Indeed St. Simeon Stylites the Syrian who actually spent many years of his life on top of a column is represented on a gilt silver plate from a Syrian relicary of the 6th century, now at the Louvre, with just such a protective snake coiling loosely round the shaft of the column.

The attempt to structuralize the pyramid form resulted at Fatehpur Sikri in a pleasure pavilion known as the Panch Mahal. Four pillared open galleries of diminishing size are arrayed one above the other, and the last crowned by a light-framed cupola. The great variety in the carving of the pillars recalls the Chihil Sutun Hall at Samarcand which Babar saw between 1520–30, and described as having ‘curiously wrought stone pillars, some twisted, others fluted, and some with other peculiarities.’\textsuperscript{90} The Turkish Sultana’s Bath is a purely Islamic building with flues beneath the floor, tubs contained in niches, pendentives of intersecting arches coated with polished stucco\textsuperscript{91} and paintings, and domes pierced with oculi. The Turkish Sultana’s house is the most charming of the smaller dwellings with its pillar shafts carrying a racked or lean-to verandah roof carved with imitation tiles\textsuperscript{92} outside (Plate 163). The bed chamber walls are covered by a fine mesh of vertical chevrons subcribing a rippling effect, and within are carved dado panels of red sandstone, one of them with splendid birds on trees and lions rambling below. But generally such figurative scenes at Fatehpur are in the medium of wall
paintings (not always well preserved and therefore better studied in the monograph of the Archaeological Survey) where, for example, in the Khwabgah or 'the house of dreams', we can discern spectators viewing activities from a roof top, manned sailing boats with houses on the banks, a figure which may be the Buddha, and a winged angel holding a child. Similarly in the so-called Miriam's House a fresco in the drawing room shows a scene of the fort with the bustle of human activity within, while on a verandah column we witness an elephant combat. Perhaps because one of Akbar's Hindu wives lived here, a bracket in the building is carved with the god Rama standing beside the monkey god Hanuman.

In the second huge court which is devoted to religious buildings Hindu influence is curtailed to a minimum (Figure 65). The mihrab wall and sanctuary arches of the great Jami Masjid (1571) is adazzle with mosaics of purely Islamic design (Plate 164). White marble infills of polygons and stars blink out of the interlacing surrounds, while colour is provided by green and blue faience inlays. Hindu features such as the three-way consoles and nut-and-shaft pillars are relegated to subsidiary functions in the prayer hall. The main emphasis is in the three sanctuary chambers with their steep stilted domes. A rectangular frontispiece iwan with low sweeping arcades on either side dominates the composition, and a queue of gazebos line up on the roof with English dignity. In the turbid red courtyard of the mosque (whose boundary walls measure 544 by 474 feet) the white Tomb of Salim Chishti (the saint whose omens had attracted Akbar to this rocky site) stands out sharply (Plate 165). The marble sheath, the simple mass, the arched tympanums, and the fretsawed grilles, all contribute to its Islamic look. In this tranquil scheme the writhing serpentine brackets supporting the eaves provide an unwelcome note. It may be observed that at the Jahangiri Mahal, built before 1618 in the Agra Fort, the principal hall on the north, which has a gallery overlooking it, has its ceiling supported by stone dragon struts (Plate 166), just as in the hall known as Ankh Michauli in Fatehpur itself. We are led to recall Marco Polo's description (c. 1295) of Kublai Khan's Palace at Xanadu (Chandu) in which gilt dragons supported the architrave with their heads and were attached to the column by their tails.
As an entrance to the Mosque courtyard at Fatehpur, Akbar built the Buland Darwaza in 1575 to celebrate his victory in Gujarat (Plate 167). The date 1601 on it is misleading for it only records a flying visit by the Emperor to this city already abandoned in 1585, whereas the date of the Gate itself is signified by the chronogram, that is the concluding words of the inscription according to the rules of the abjad notation. Here in this gate the simple triple arched scheme has undergone a major transformation. A pile of steps rising 42 feet is carried up to the level of the courtyard from the plain below. Atop this a rectangular block rears up another 134 feet like an awesome precipice. It is scalloped by a mighty arch backed by a half-dome portal. The latter rises from pentagonal wall in which are the voids of the gallery windows and a diminished entrance way serving to relate the size of the whole to the scale of man. The great centre piece is flanked by brief sections that are skewed at an angle and which do not rise quite as high, so that they appear to recede backwards. These chamfered faces are treated with two-storey recessions separated by a triforium gallery. Bulb finials on open parapets and domed kiosks set behind them stand against the skyline. The whole scale is appropriately lowered on the interior of the courtyard in deference to the mosque.

There can be no doubt that this Buland Darwaza was built by the same group of architects who designed Humayun's Tomb, though this resemblance has eluded most historians. Humayun's Tomb in Delhi was erected under the supervision of Haji Begum, the monarch's wife, and according to Badaoni designed by the architect Mirza Ghiyas from 1561–2 to 1570, and in it all those features were to be found, including semi-domes nested within rectangular screens, canted angles with miniature alcove repetition, and white marble for the emphasis of structural forms (Plate 168). There are sedate four-centred arches with deep valleys of shadow on the undersides lending depth to the façades, a broad swelling dome with suave ellipse whose white form melts into the sky, and ribbed intersecting pendentives in the portal half-dome. The sweeping base of the pedestal arcade, the chamfered wings of the two-storeyed corner chambers (with connecting circumambula-ting corridors), and the high drummed dome clearing the fronton and flanked by kiosks, constitute themselves into a synchronous whole. A straight runnel of water in the parterred garden establishes intimate accord between earth and edifice.

Akbar was personally interested in Architecture. Monserate, the Jesuit priest, reports that Akbar sometimes quarried stone himself and that he even practiced crafts 'for the sake of amusement'. Jahangir inherited his love of art, and from his Memoirs we obtain more than a fleeting glimpse of his tastes and interests. He gives detailed descriptions and dimensions of the Mosque court at Fatehpur Sikri, including Salim's Tomb and the Buland Darwaza, also of the Ahmadabad Mosque, of Muhammad Tughlak's Fort at Dhar in Malwa, and of the seven storeyed Haft Manzar at Mandu of Mahmud Khalji. He gives orders to experienced architects to redesign Akbar's Mausoleum whose original design he disapproves; he promotes his architect Abdul Karim for his buildings at Mandu; he has a ma'nara built at the head of the grave of a favourite antelope; he has marble statues made of the Rana and his sons and places them in the garden in Agra below the jharoka (exhibition window); and he repairs his picture gallery in Kashmir and adorns it with pictures by master hands. When Jahangir built his father Akbar's Tomb at Sikandara (1605–13) near Agra he Islamized the peristylar scheme of the Panch Mahal by employing instead circumambulating galleryed arcades supporting the superposed terraces, with a huge half-domed portal in the centre of the principal side, and by decorating the frames of the latter with floral, coloured inlays (parshinkari). The mortuary chamber, though below ground level, is covered by a dome which rises 60 feet up to the second storey of the cloisters (Figure 66). The cenotaph of Akbar is contained in the white marble pent-house on the fifth 'rung' which is open to the sky. Since it is obviously designed as an elevation, this memorial is unsatisfactory from a perspective view: the staggered pyramid strata disappear, and the structure seems congested with desultory kiosks. Akbar had died in 1605 and Jahangir says in his Memoirs that though he had wished his
father's tomb should be without parallel in the world, circumstances compelled him to be absent for the first three years and the architects had gone ahead with their own ideas. But in 1608 after consultation with some wise men he ordered that the masons should 'reconstruct some portion of it, and by degrees a lofty building came into existence.' (This is an interesting sidelight on the influence of some monarchs on the monumental buildings of their reign.) The two-storeyed south gate with its four marble minarets (restored in 1905) is inscribed with the dates 1612 and 1613, suggesting the date of completion of this monument (together with its high wall, blind gateways on the axis, and formal garden), and the inscriptions are signed by the calligrapher Abdul Haqq bin Qasim of Shiraz. Needless to say, the decoration of Akbar's Tomb is of the highest quality; including the veneered white marble inalys in the red sandstone gateway, the geometric window grilles enclosing the tombstone open terrace, the ceramic tile work on the kiosks, and the red, blue, and gold murals in the vestibule of the crypt. Similarly, Jahangir's Mausoleum (1627) at Shadhara near Lahore has fine murals and mosaics in pavement and wainscot, though it is an undistinguished building consisting of oblong rooms and corridor surrounding an octagonal mortuary chamber, with a minaret engaged at each of the four angles of the exterior. Four broad passages on the cardinal points pierce through the thick walls into the central chamber which had an opening in its dome—perhaps in fulfilment of Jahangir's desire expressed in his will (as reported by the contemporary Muhammad Salih) that he be buried in an open place where rain could fall on his tomb.102

The most successful building of Jahangir's reign was erected by his wife Nur Jahan for her father who was Prime Minister of the realm and of Iranian origin. The Mausoleum of Itimad-al-Dowlah (1621–8), situated in the centre of a walled formal garden on the east bank of the Jumna at Agra (Plate 169), is a low reticent building of white marble with octagonal open turrets engaged at the angles. A modillion cornice deftly marks off the terrace level on which reposes the cenotaph chamber. Over this is pitched a ridged and vaulted roof vaguely resembling a silken tent. The structure has a certain elegant dignity, and its parts are so well co-ordinated that it would be quite natural if the last piece had slid into place of its own volition.

The quiet sobriety of its controlling lines is deceptive; from a nearer view its bland surface becomes alive with multichrome mosaics portraying porphyry flowers, vases, and blue-green leaves. These semi-rare embedded stones have somewhat weathered on the outside and lost their glow, but on the cold marble floor of the upper chamber where the sun blazes through gossamer grilles they are in their pristine state. We have seen that white marble had been used in strips for outlining forms ever since the time of Allaudin Khilji, and in Tughlak's Tomb the whole dome had been covered with a sheath of white marble. Thereafter it had become a regular practice to use finely dressed materials in thin slabs over a rubble or brick structure. As façade decorations, polychrome marbles appeared for the first time on the spandrels of the entrance arch of Sher Shah's Mosque in the Old Fort at Delhi in 1545, but they were still of the geometrical mosaic type. The floral type begins, possibly under the influence of
tile work, in the reign of Jahangir who was responsible for the outer gate of Akbar’s tomb at Sikandara where they appear for the first time by 1613. (One exception may be the coloured stones forming an open flower in the mihrab of the Jami Masjid at Ahmadabad of 1414.) The use of semi-precious stones, or pietra dura, was the next step after the use of coloured marbles, though the actual step may have been taken on the suggestion of the Italian jewellers at the Mughal court. It is notable that this type of ornamentation behind Shah Jahan’s throne in the Public Audience Hall in Delhi included among its subjects a copy of Raphael’s picture of Orpheus charming the beasts, which was itself based on a picture in the Catacombs of Rome.

Another medium of decoration revived under the Mughals was glazed and painted tiles. There is an interesting early sequence of these on the walls of the Lahore Fort whose West Gate, the Hathia Pol, is dated by an inscription 1631, the probable date of the tiles. There are represented dragons with ‘long horns, staring eyes, and shaggy hair’ in the act of pursuing goats, pelicans in full flight, bulls engaged in mortal combat, elephants with trunks interlocked urged on by relentless mahouts, travellers leading their dromedary, equestrians shooting lions or playing polo, guards sounding the reveille, angels lassoing demons, and so on.... The palette is a pleasant one with prevailing lemon yellows, emerald greens, and tree bark browns. Excellent faience was subsequently made for Wazir Khan’s Mosque at Lahore (1634), and for Shah Jahan’s Jami Masjid of Thatta in Sindh (1644–7, completed 1658–9) whose main cupola and pendentives are most attractively conceived.

Another media popular among the Mughals was wall painting. Most notable in this connection was the introduction of European themes and techniques. For example on the occasion of the reception held by Jahangir at Mandu in 1617, there were over the throne pictures of the King and Queen of England, the Lady Elizabeth, Sir Thomas Smith and others. In one of the miniatures of the seated Emperor are visible a Madonna and an Ecce Homo on the palace wall. The main gateway of the Mausoleum at Sikandara had a figure of the Mother and Child next to a cross on whose other side was St. Ignatius, while there were angels and cherubs in the dome, all of which were whitewashed over by order of Aurangzeb. Later, the bath house-cum-banqueting hall of Prince Asaf Khan, son of Shah Jahan, at Lahore, was painted with scenes of St. John the Baptist and Noah with his Ark.

Already under Jahangir the Akbarian interlude was passed off as a temporary deflection and ignored. Henceforth under Shah Jahan there was to be a planned adoption of purist values, chief among which were simplicity, and almost acid clarity. Marble, intractable to some, obdurate to others, was now made to yield suppleness and grace.

One of Shah Jahan’s many building schemes was the Garden of Shalimar at Lahore (1640–42), which is comparable with Nur Jahan’s Bagh-i-Nur Afshan on the east bank of the Jumna at Agra. The 44 acres of the Shalimar Bagh is contained within a walled enclosure measuring 1650 feet by 750 feet, engaged with corner polygonal towers surmounted by kiosks, and is entered by two gates. Across the middle of the plot is a wide oblong pool studded with jets (Plate 170) which play when water, brought by a 37 mile long canal built by the Persian engineers of Ali Mardan Khan, is filled into the cistern on the uppermost terrace. The white marble platform in the centre of the tank is approached by causeways from the margins on which two white pavilions stand. On the third side, where the level of the land is higher, is the principal pavilion with a cascade and white throne dais overhanging the pool, and from the fourth side lead esplanades flanking a canal with a pair of kiosks at the head and a triple arched screen culminating the vista. The garden area on either side of the pool complex is subdivided into a grid by means of canals with minor pools at the intersections. The graph-paper on which garden plans were then made, as apparent in a Mughal nature, would have facilitated drawing this on plan. Strict formality of the layout at Shalimar is ameliorated by verdurous and venerable trees. Already as a Viceroy Shah Jahan had planned his Shahi Bagh Palace in Ahmadabad (c. 1618–22) on these lines. For as Thevenot describes it in 1666 the garden was laid out in raised stages, the
uppermost containing a terrace commanding a view, and a green tiled pavilion lay at the intersection of four walks.\textsuperscript{110}

Though much of Shah Jahan's Royal City within his Red Fort at Delhi (1638–48) built by the architects Ustad Ahmad and Hamid\textsuperscript{111} has since disappeared, it is evident from the surviving buildings that symmetry was rigidly maintained along the principal axis. Along this axis lay successively the Lahore Gate preceded by a barbican at right angles to it and approached by a bridge (originally a wooden drawbridge) crossing the moat of 75 feet width, followed by a vaulted hall flanked by two-storeyed shops. This emerged onto a preliminary court with a gateway-cum-

naqqar-khana (or gallery for martial music) at the end of it. Finally this led to a great public court at the head of which lay the twenty-four columned Audience Hall with its elevated throne platform.\textsuperscript{112}

On this reposed the fabulous Peacock Throne (ereccted by Saiyid Gilani in 1627–34) which was looted by Nadir Shah in 1739. On both sides and at the end of the axis lay harems, baths, formal gardens and pavilions for royal occasions. Of these the most distinguished is the white marble Divan-
i-Khas or Private Audience Hall (c. 1642), an oblong hall open on all sides with a flat roof carried on piers and arcades (plate 171). Angular eave-slabs nestle above the ripple of the arches, and are accentuated by immaculate corner kiosks rising from the parapet wall. The arched engravings are continued in the interior; the ceiling is bedecked with a shimmering network of gilt relief ornament, and the piers inwrought with semi-

precious stones. Backed against the ramparts is the raised dais of the throne, bathed in light, on which sat the emperor surrounded by the prime luminaries of the state. Further along the rampart is a similar pavilion known as Rang Mahal (coloured palace). A shallow channel runs along its central aisle and flows into a lotus pool. Through the water waves the ornament like fluttering ribbons in the wind. We should imagine these pavilions as Bernier saw them preceded by scarlet tents lined by chintzes hung with satin canopies and dangling golden tassels. Shah Jahan was evidently not satisfied with the basic planning of the Fort. The Emperor is reported by Nawaz Khan to have desired to design his city after the fashion of Baghdad and Isfahan. He had consulted their maps,\textsuperscript{113} and their covered octagonal bazaars had appealed to his fancies.\textsuperscript{113}

It is evident that the Red Fort of Delhi was patterned after that of Agra, for the latter was the capital of the first great Mughals. It was they who designed Agra as a riverside garden-city, and vestiges of their palaces still await excavation along the east bank of the Jumna. The present Citadel of Agra was built on the west bank by Akbar between 1565–73, though an inscription from 1600, the year of Akbar's final retirement, is to be found on one of the inner gates. As was the general practice, sand and rubble walls are once again covered with a dressing of red sandstone laid in large slabs.\textsuperscript{114} The 40 foot high curtain wall with 15 bastions and towers engaged along it at intervals, makes a bow-shaped circuit of 1½ miles, and is penetrated by three gates—one of them, the Water Gate, having access to the river by means of a canal so as to permit the ladies of the harem to sail into the Fort in their daily adorned royal barges in complete privacy (figure 67). On this side too there was a wide terrace between the outer and inner walls. The inner wall, with its embattled parapet, round towers concentric with the towers of the outer wall, its peak-shaped hood protecting both machicolations and loopholes for musketry, and its 16 reinforcing bastions, rose 40 feet higher than the outer wall, which was surrounded by a 35 feet deep moat crossed at the South and Delhi Gates by drawbridges. At the former not only was a barbican thrown out from the curtain, but an intermediate barbican was introduced so that if the enemy were besieging from this side it would have to penetrate three gates successively, each facing a different angle, and each exposed to fire from a bewildering array of vantage points, one higher than the next (plate 172). The way then lay up a steep slope hemmed in between high walls. The chief engineer of the Fort was Kasim Khan.\textsuperscript{114}

In Agra the Jami Masjid was begun in 1644 by Shah Jahan outside the Fort, and completed by his daughter Jahanara in 1650. In Delhi an even greater Jami Masjid was erected outside the Fort between 1650–56, which still stands as the landmark of the present Capital. This mosque covers an area of no
less than 1400 square yards. It is raised on a high
plinth 30 feet above the ground, and approached
by three steeply graded flights of steps at the head
of which are gates of almost cubical proportions.
A vast paved quadrangle precedes the prayer hall.
Rising behind its symmetrical screen of engraved
arches are three marble domes with red inlay bands
enhancing their swelling shapes (PLATE 173). Tall
octagonal striped minarets 130 feet high stand at
the two back corners.

At the same time Shah Jahan built a private
mosque of this kind in the Agra Fort, the so-called
Pearl Mosque (1646–53). Its white marble gives it
a rather cold and impersonal look, and one misses
the dominance of the principal dome. As for the
rest of the Agra Fort, there are hamams with mirror
mosaic walls which once reflected in a thousand
lesser echoes some tawny inmate of the harem at
her bath; there are sunken gardens with patterned
flower-beds framed by white marble, cool porches
with columnar avenues, and balconies overlooking
the rampart walls. Far across a waste the Jumna
winds its course, and on its bank an apparition
floats. In his long years of imprisonment this was
the vision that gave Shah Jahan his only solace,
for it was the Taj Mahal gleaming on the horizon
that over-canopied the mortal remains of his wife
Mumtaz who died giving birth to his fourteenth
child.

The great expense and the seventeen years of
tool (1632–49) had not gone in vain, for here in the
end was a building that seemed to tell only too
well of a grief turned into a glacier calm. True,
every feature almost could be traced back to 15th
century Iran and Turan, for instance the chahar
bagh garden to Herat; the double storey cen-
apartments with central dome to the Tarebkhana
palace at Herat described by Babar; the high
cylindrical drum to the Tomb of Timur in
Samarcand and in the Mausoleum of the Timurid
rulers in Herat; the plinth with canal and the
8-chambered centralized plan to the Ak Kuyunlu
Uzun Hassan’s palace complex at Tabriz now
disappeared; the four corner minarets to the Char
Minar at Tabriz referred to by Evliya, as well as to
the Musalla and madrasa at Herat, and the mosque
of Bibi Khanum at Samarcand; the axial symmetry
of the layout to the Maidan-i-Shah at Isfahan, the
skewed-back flanks with storeyed niches to the
shrine of Abu Nasr Parsa at Balkh, and the
Mausoleum of Mulla Hassan in Sultaniyah. But
all this by no means reduces the great merit of the
Taj whose rich sobriety, calm amplitude, and
sedate proportions have endeared it to the most
exacting critics as well as to the casual visitor.
Anyone who is aware of the antecedents of the Taj
must needs scorn the contemporary statement of
Father Manrique that the Venetian jeweller
Geronimo Veroneo was its chief architect. If he
was its architect he must have understood the aloof
and lofty idealism of Islam better than any man
before or since, and further he must have been a
diligent student of Humayun’s Tomb, and the
Tomb of Khan Khanan (1626), both at Delhi. It is
much more likely that Ustad Ahmad was entrusted
with the design as stated by his sons, since he
was one of the chief architects of Shah Jahan, and
was a native of Lahore where the shape of the Taj
dome was paralleled in the Mausoleum of the
Prime Minister Asaf Khan (PLATE 174) at Shadhara
(1641–5) now stripped of its marble. It is even
possible that Shah Jahan himself may have played
a role in the design since we know that he used to
visit the Building Department and studied the plans
and models of proposed buildings, when he
criticized them and made suitable alterations.

The first view of the Taj is as a picture framed
by the vault of the storeyed rectilinear gateway.
The mausoleum, rising at the end of the vista from
a carpet of green, pours like a white cloud into the
sky and condenses into a smooth and effortless
clustered pile (PLATE 175). The middle distance is
cleft by a stream gliding in its causeway toward a
vanishing point; it is paralleled by rows of conic
cypresses trekking toward the shrine. At a half
way point a lofted lotus pool appears with padded
lilies reflecting in its face, and deeper still, the
Taj—like rich cream floating in a shimmering dish.
The seemingly ageless tomb chamber rises from a
platform, its corners sliced away and pared into an
octagon. A diminutive doorway set within a great
half domed portal announces the human scale.
Engaged to the fronton and descending to the
ground are colonnettes with zig-zag markings;
these clear the parapet level and break out into
buds with golden finials. In each shorn face of the
octagon are double storeyed recessed arches. The tall drum enables the outer dome to ride high above the fronton screen, and at the incurring before it bosoms into a swell this dome is pierced by a garland of petals in low relief. Again at the apex before it terminates in a finial, a corolla of inverted lotus leaves is introduced. On the terrace nestling beside the dome are quartet of satellite cupolas. Four minarets at the angles of the plinth on octagonal bases, together with two flanking buildings, one of them a mosque, help ‘contain’ the main body of the chamber. Enshrouding the middle of the domed chamber is a screen of perforated marble serving as a diaphanous veil through which is seen the white cenotaph of Mumtaz lying beside that of her husband. The sarcophagus itself is immured in typically Timurid fashion directly below in a crypt. Corridors radiate out to the four entrances and to the four angle chambers and through them to the exterior niches, and make a pretty plan (Figure 68). As the eye accustoms itself to the light, the dadoes become mottled with colour among which ruby reds and emerald greens predominate. These are the pietra dura inlays of jasper, cornelian, turquoise, onyx, opal, agate, coral, lapis lazuli, bloodstone, and other semi-precious stones fashioned into a variety of floriate scrolls and sprays.\textsuperscript{118}

However the greatness of the Taj lies not only in its rich materials, and in its scenic setting and symbolic aim, but also upon its controlled and classic lines. Everywhere there is reticence of emphasis, though every statement is justly and generously made. The different parts do not appear to have any exact measurable relation, and in fact Muhammad Salih Kambo expressly claims that the wisest geometricians would fail to interpret the basis of its ‘guava-shaped dome.’\textsuperscript{119} The minarets themselves might at first seem ill-proportioned, but it should be noted that their two lower stages correspond with the two-storey alcoves, and the uppermost stage with the height of the satellite domes. Moreover, the black edgings of the marble courses in the minarets are intended to endow them with the appearance of solidity since they are the framing members, and their tapering from the inner side only is contrived so as to maintain a rigid vertical on the outer.

After such a marvel as the Taj, there could have been no hope of advance but to break fresh ground, and to launch new leading principles. To ask for a new archetypal ideal of a decaying age was of course to await the impossible. As it turned out, instead of inventiveness, there was only ossification. This was inevitable considering the Mughal Empire was gradually being stripped away, and there was no powerful controlling mind forthcoming to revive the declining structure of the state. Aurangzeb’s frugal and repressive policies only succeeded in stifling Mughal art.

Every building dating from the post-Shah Jahan period reveals the falling away of a high standard. The Moti Masjid of Delhi (1662–63) is affected and superficially pretty with its bird-cage turrets floral-shafted pinnacles, and over-large beaded finial. The courtyard is looped, and the piers fatally shorter than the span of their arch. The domes have bulged ‘a little more than a little and become much too much.’ The Badshahi Mosque of Lahore (1674) is based on its Delhi prototype, from which it differs only in proportion and in the use of more playful ornament (Plate 176). The domes are polished to an incredible finesse, though their glary white marble refuses to blend with the burnished substructure. The Tomb of Rabia Daurani at Aurangabad (1678), built by the architect Ataullah, son of the great Ustad Ahmad, has a shoddy surface and stilted impression. The starched rigidity of Safdar Jung’s Tomb at Delhi (1756), the dry repetitive Palace of Lights in
Lucknow (1784), and the gloomy talar Palace of Tipu in Mysore (1760–67), are all testaments of a rapid degeneration. There was a tendency toward rococo,\textsuperscript{128} but in this mood late Indian architecture did not reach any high achievement and had no coherent aim. The types and forms evolved by Mughal architecture survived and bore fruition not in their own domain, but among the native princes of India, whose 17-18th century palaces, and even temples,\textsuperscript{129} continue to bear the hallmark of Muslim ideals.

NOTES

1. Hajjaj wrote to Muhammad Qasim: 'After they have become zimmis (protected subjects) we have no right whatever to interfere with their lives or their property. Do therefore, permit them to build the temples of those they worship. No one is prohibited from or punished for following his own religion, and let no one prevent them from doing so, so that they may live happy in their own homes.' (\textit{Chach-nama}, i, 168–9.)

1a. This might correspond with the conquest and looting of this whole Sea Coast by the Ghorid ruler in 1182 (\textit{Tabakat-i-Nasiri}, tr. H. G. Raverty, i, 1881, pp. 452–3). But if hydrological studies have established that the Indus river shifted its course (\textit{Pakistan Archaeology}, i, 1964, pp. 49–55), then surely one would have expected this to have been as a direct result of the terrible earthquake of AD 893 which destroyed practically the whole city of Daibul, and decimated 150,000 people (\textit{Kamit Ibn Athir}, Leiden, v, 323; Cairo, vn, 166).

2. Al-Hajjaj's Mosque at Wasit (702) had no mihrab (\textit{Faud Safar, Wasit 1945}, p. 20). Neither is there any trace of a mihrab in the Mosque excavated at Susa in Iran, which is suggested to date from the end of the 1st century of the Hijra. Perhaps like the Prophet's Mosque at Medina, the Mosques at Bhambose and Susa had a stone marking the qibla. The Susa mosque measured 55 x 45 metres, and had four rows of columns in the sanctuary and two rows on the remaining sides of the court (R. Ghirshman, in \textit{Bulletin d'Études Orientales}, xii, 1948, pp. 77–9).


4. G. T. Vigne, \textit{A personal narrative of a visit to Ghazni, etc.}, 1840, p. 129, and fig. on p. 125.


7. S. Flury, op. cit., p. 84, pl. xx. Moreover, recently at Larwand in Ghora small mosque with Indo-Islamic decoration c. 1200 has been discovered (M. Klimbing, in \textit{Buctan} (Vienna), Hft 3, 1963, p. 34 and plate).


10. Ibid., pp. 463–6.

11. Ibid., p. 373.


15. Ibid., pp. 29, 39, pl. 39.


20. i.e., birds of happy augury in Persian mythology, but in reality probably the Hindu garuda, vehicle of Vishnu. Did it originally crown the Vishnu pillar such as is now in the Kutub Mosque?


22. As Qutb in the language of the Sufis means axis or pole, Kutubuddin may have conceived the intention of naming his new capital the axis of the world. Kutubuddin is called 'guardian of the world' in a Sanskrit inscription in a well at Palam in Delhi dated 1281 (\textit{Epigraphia Indo-Moslemica}, 1913, pp. 43–5. In favour of the theory that it is a 'victory tower', is the devanagari inscription on the Kutub which describes it as such. (\textit{A.S.I. Memoirs}, 22. 1926, p. 40, no. 7). But Van Berchem gives reasons for believing it was begun by Kutubuddin as his own mausoleum (in \textit{Diez Churasinghe Baudenkomaer}, 1918, pp. 109–116).

22a. Both the features of the gallery supported on mukarnas niches, and the reeded form of the shaft had appeared earlier in Transoxianan minarets, the
first in the Kalyan minaret in Bukhara (1127), and the second in the Jar Kurgan minaret of 1108.

23. Allaudin Khilji admits to putting a new casing and cupola on the Kutub according to Amir Khusru writing in 1311 (Elliot and Dowson, op. cit., iii, p. 70) while Firoz Shah Tughlak says that in repairing it after the lightning he 'raised it higher than it was before.' (Ibid., iii p. 383.)


26. Geographie de Aboulseda, tr. M. Reinaud, 1858, ii, p. 120.

27. The setting up of pagan trophies in religious buildings was by no means a novel practice. For instance an Egyptian obelisk was erected in the forecourt of a church in Alexandria (A. J. Butler, The Arab Conquest of Egypt, p. 372). In c. 1223 Atabeg Saad bin Zangi actually built a mosque circumscribing the Tomb of Cyrus at Pasargad (Ali Sami, Pasargad, Shiraz, 1956, p. 101).

28. This fact is known from the inscription of 1191 on the inner part of the east gateway, which also records the conquest in that year.


30. See e.g. A. Banerji, 'Some sculptures of the Qub Mosque,' in Indian Culture, Apr. 1936, pp. 760–85.

31. W. Barthold, Turkestan down to the Mongol Invasion, 1928, p. 10.

32. A prototype of this was the Jasmine Mosque at Tiberias described by Nasir-i-Khusrau in 1047. Below the platform in the middle of a colonnaded court were the tombs of the 70 Prophets (Plasentine Pilgrims Text Society, iv, 1897, p. 17).


34. These are to be found again in Allaudin Khilji's red sandstone Jamat Khana Mosque at the Dargah of Nizamuddin Auliya in Delhi.


36. E. Strong, Art in Ancient Rome, ii, p. 184, figs. 539, 456, cites other quadrifrontal archways such as that of Marcus Aurelius at Tripoli, Vienne in France, Tebessa in North Africa, and Malborghetto in Rome.

37. Amir Khusru says in 1311 that he wanted to build a minar so high that it could not be exceeded, and directed that it be double in height and circumference to the Kutub (Elliot and Dowson, op. cit., iii, p. 70).

38. The Kitab i Yamini, tr. J. Reynolds, 1858, p. 200.

39. The city itself had a wall described by Ibn Battuta in 1333 as 11 cubits thick, the lower part of stone, the upper of brick. There were intramural chambers for guards, armoury and grain storage, and a continuous enclosed gallery permitting communication from one end of the city to the other. There were 28 gates besides numerous closely placed bastions (Elliot and Dowson, op. cit., iii, pp. 589–90).

40. Three registers of arrow slits, including one in battlements, occurs at the Chilburj Fortress in Transoxiana, a 4th century fortress re-used in the 10–12th century. (G. A. Pugachenkova, Development of South Turkenian Architecture... (in Russian), p. 53, cf. p. 50.


42. A. A. Bevan, in Journal of Theological Studies, vii, 1904, p. 21. For the role of water in the after-life conceptions of ancient Mesopotamia, Egypt, Syria, etc., see A. Parrot, Le 'Refrigerium' dans l'au-Dela, Paris, 1937. However water jar finials are to be found also on Indian Temples, e.g. at Khajuraho c. AD 1000 (see A. K. Coomaraswamy, History of Indian and Indonesian Art, 1927, pl. lxxiv).

43. A mausoleum in the cemetery at Dakhisthana in Transoxiana has such battered half round towers with a little domed drum over each as at Multan (G. A. Pugachenkova, op. cit., p. 294).

44. He adds that domestic houses were usually one storey and sometimes two storeys high, and that only the Sultan paved his house with marble. (O. Spies, An Arab Account of India in the 14th Century, Stuttgart, 1936, pp. 28–9).

45. Shams i Siraj Asif, Tarih i Firozshahi, tr. in Elliot and Dowson, iii, p. 344.

Similarly, the historian Ziauddin Barni proscribed the construction and public use of music halls (tarababat) in cities (Medieval Indian Quarterly, iii, 1957, nos. 1, 2, p. 20).

46. Futuhat i Firozshahi, tr. in ibid., iii, p. 382.

47. Elliot and Dowson, op. cit., iii, p. 299.
48. For the purpose of building the Great Mosque there, according to Ferishta (Briggs, Ferishta, i, p. 494) Timur himself says in his Autobiography that after the sack of Delhi he 'ordered all the artisans and clever mechanics who were masters of their respective crafts should be picked out from among the prisoners and set aside...to await my command...I had determined to build a Jami Masjid in Samarcand, the seat of my empire, which should be without a rival in any country.' (Maluzat i Timuri in Elliot and Dowson, op. cit., iii, p. 447).

49. As at the Mausoleum of Ubeda and Zubeida at the Mazar Astana Baba. See Pugachenkova, op. cit., p. 287.

50. Muslims are known to raise carins at the approaches of sacred towns (Frazer, The Scapegoat, pp. 21-2; Doughty, Arabia Deserta, 1888, i, p. 285f. 447).

51. But at about the time of Tughlak's Tomb (1325) there was at Qul Hisar in S. W. Anatolia a castle on an islet in a lake connected by a causeway with the shore, according to Ibn Battuta (tr. Gibb, ii p. 424, cf. p. 452) In the Indian tradition we have Kalidasas's much older reference to pleasure houses standing amid the waters of garden tanks (Raghuvamsa, xix, 9).

52. The Tarikh-i-Rashidi, tr. E. Denson Ross, 1895, p. 429. Mirza Muhammad claims that his town palace of wood was 12 storeys high, some of which contained 50 rooms, halls, and corridors.

53. The Emperor Jahangir confirms this in the case of the Jami Masjid of Ahmadabad: 'On the right of the pulpit is a separate seat for the king' known locally as muluk-khana (king's chamber). He describes it as a caged-in stone platform, and attributes its use to the overcrowding of the building (Tuzuk-i-Jahangiri, tr. A. Rogers, i, p. 425).


55. As at the Kulan Masjid in Delhi, a type which originates in the muallaqa, or 'suspended' mosques, for example at the Mosque of Salih Talali in Cairo.

55a. Most are thought to have been carved especially for the Mosque, though two may have been preserved from Jain temples, for there are many such ceilings in Gujarat temples (J. M. Nanavati and M. A. Dhaky, 'The Ceilings in the Temples of Gujarat', in Bulletin of the Baroda Museum and Picture Gallery, xvi-xvii, 1963).

56. Oscillating minarets are known also in Persia where the cause for their ability to be set in motion has been examined (J. Dieulafoy, La Perse, la Chaldee et la Susiane, 1887, pp. 278, 281). Ibn Battuta describes a shaking minaret of the Great Mosque of Basra, and another in Andalusia at Barshana, north of Almeria (tr. Gibb, ii, p. 278). For shaking minarets in Egypt, see Maqrizi, i, pp. 203, 226.


59. H. Waddington, in Ancient India, 1946, no. 1, p. 64.


61. There was a Ship Palace called Zaww built by the Abbasid Caliph Mutawakkil in Baghdad, which is referred to by al-Buhturi (d. 897).

62. For map of Mandu showing walls and gates, see E. Barnes, in Journal of the Bombay Branch of the Royal Asiatic Society, xxii, 1904, opp. p. 391.

63. According to Sheikh Ibrahim's Tarikh-ul Haq the first mosque built in 1306-7 was of wood, and it was Malik Karimuddin who replaced it with a mosque in stone (K. K. Basu, in Indian Culture (Calcutta), iii, no. 1, 1936, p. 118).

64. In N. W. India Fa-Hien (339-414) records that great drums, conches, and copper cymbals were placed from a high gallery by keepers of the vihara before the king went to worship (A record of Buddhist Kingdoms, tr. J. Legge, 1886, p. 37).


69. Towers are dated 1538, 1552, 1561, 1565, 1568, 1570, 1576, 1578, 1583, 1613, 1641, 1646, 1655, 1658, 1661, 1662, and 1666 (see Muhammad Nazim, Bijapur inscriptions, 1936, Memoirs of the A.S.I. no. 49, pp. 47-57).

70. C. D'Ohsson, Historie de Mongols, 1835, iv, p. 486.

71. He executed the gilt decoration on the mihrab of the Jami Masjid of Bijapur.


72a. In the manner of that at the Mausoleum of Ahmad Iasivi, Turkestan (1398), and especially the Chehar

73. Brackets are a special feature of Bijapur architecture. They are of extremely length and elaboration, and even imitation brackets resembling raised elephant trunks are painted as medallion supports. Another animal theme occurring frequently in Deccan monuments—lion overpowering elephant (*gandabherunda*)—is suggested to be symbolical of the conquest of foreigners over natives (H. Goetz, 'Indo-Islamic figural sculpture', in *Ars Orientalis*, V, 1963, p. 238; Figs. 9, 15, 16, 34, 40, 43).

74. The biological exuberance of Bijapuri art at this period is argued to have been the result of the influence of Hindu Vijayanagar, which fell in 1565 (H. Goetz, in *Journal of Indian History*, xix, 1940, pp. 249–55). But the Indo-Saracenic buildings at Vijayanagar themselves do not have these characteristics (see A. H. Longhurst, *Hampi Ruins*, 1917, pp. 46–92). After 1602 the Hindu Nayak rulers of South India built their palaces in a pseudo-Muslim style (cf. K. Fischer in *Indo-Iranica* viii, no. 1, 1955, pp. 4–5).

75. In a mosque of Jahangir in Kangra Fort dated 1621 it is actually inscribed that this mosque is radiant with light shining on the forehead of worshippers. Hadi Hassan, *Researches in Persian Literature*, 1958, p. 191.


77. Certainly Babar's mosque in the Kabuli Bagh at Panipat in East Punjab (see *Indo-Iranica*, ix, 1956, no. 2, Pl. i, p. 68) appears to be a purely Muslim building.


80. Ibid., p. 185.

81. Ibid., pp. 153, 168, 179.

82. Ibid., p. 180.


84. For details see R. A. Jairazbhoy in *Islamic Culture*, xxxi, July, 1957, pp. 249–54, and *Oriental Art*, iv, no 2, 1958. I have since observed that the basement storey of Azam Khan's Palace at Ahmadabad closely fits the description of the octagonal tower of the Talisman Palace. Raking Ventilator-cum-light shafts reach down from grilled openings just above ground level to the basement rooms—suggesting a similar arrangement at Agra.

85. I follow here Badaoni who claims that Akbar completed the Elephant Gate at Agra in 1568, and in the same year began the Mosque of Fatehpur Sikri which was completed in about 5 years. He himself found the dates 1568, 1570 and 1571 for the commencement of the whole palace, mosque, chapel, etc., (Muntakhabat Tawarik, tr. W. H. Lowe, ii, pp. 112–13). He also gives us the date 1575 for the completion of the Ibadat Khana (ii, pp. 203–5), a debating hall for theologians.

86. The Jesuit missionary Monserrate who visited Fatehpur in 1580–82 says that within the circuit of the Emperor's palace are four great royal dwellings, the largest and finest that of Akbar himself (cf. W. H. Heras in *Journal of Indian History*, 1925, 3 and 4, pp. 53–68). 'Jodh Bai's' palace measuring 231.5x215 feet fits this description better than any other.

87. There were images of Siva, Lakshmi and Ganesha according to S.M. Latif (Agra, Historical and Descriptive, 1896, p. 156).

88. The Mahabharata had been translated in 1582–4 together with a commentary, and, according to Badaoni, was embellished with pictures (Elliot and Dowson, *The History of India as told by its own historians*, 2nd edit., 1953, pp. 69–70). It is significant that Abus Samad, whom Humayun had brought from Iran, painted a miniature c. 1555 of the Emperor seated with his son Akbar on an octagonal platform set on a tree trunk which was connected by means of an aerial bridge with the upper storey of a kiosk (cf. E. Wellesz, *Akbar's Religious Thought*, 1952, pl. 2). In a miniature of c. 1500 from West Turkestân the elect ruler accompanied by angels is seated as though in Paradise on a hexagonal parapetted throne set on a tree and approached by steps (E. Dermenghem, *Muhammad and the Islamic Tradition*, 1958, pl. opp. p. 158). Perhaps this idea was ultimately suggested by the report that the Ethnopolitan king lives on top of a tree with 1000 steps leading up to it. (V. Minorsky, *Marvazi*, 1942, p. 54). On the other hand we have an Indian prototype of the figure seated on a column with a lotus capital at the caves of Kanerhi. A pair of naga rajas with serpent haloes support the column (Fergusson and Burgess, *Cave temples of India*, pl. X fig. 35).

89. This practice is known at least as early as the Gupta Age in India (R. N. Saletore, *Life in the Gupta Age*, 1943, p. 103).

91. According to Chardin high gloss was obtained by polishing the fine plaster with talcum blended with lime (Sir John Chardin's Travels in Persia, ed. N. M. Penzer, 1927, p. 260).

92. Rounded roof tiles in medieval China were reserved for public buildings and the houses of people of rank (J. Gernet, Daily Life in China, 1962, p. 116).

93. In the contemporary Tomb of Muhammad Ghaus (d. 1562) at Gwalior, a screen of pierced tracery similarly encloses a corridor around the mortuary chamber.

94. The Book of Ser Marco Polo, tr. H. Yule, 1903, i, p. 299. But the Mughal examples must belong to an indigenous tradition since at Fatehpur in the buildings known as Ankh Michauli and Astrologer's Seat the serpentine struts spring from the mouths of makaras as in the architecture of the Jains at Gujarat. Elephant trunk brackets also occur at Fatehpur.

95. V. A. Smith, in Journal of the United Provinces Historical Society, ii, 2, 1921, p. 59f., who traces the ultimate source of the inscription, 'Jesus says, life is a bridge, pass over it but do not build a house upon it,' to Hassan of Basra, c. 728.

96. E. B. Smith has shown that these orbis-like cupolas crowning Mughal gates have a late Roman prototype in the castrum Palatium gateways as they are pictured on coins (Architectural Symbolism, 1956, p. 185, figs. 32-46). The arcaded loggias over Muslim gateways are, however, not appearance galleries for the ruler but are intended for martial music.


98. The Tuzuki-Jahangiri, tr. A. Rogers and H. Beveridge, ii, pp. 71-2; i, pp. 424-5; i, p. 407; i, p. 381.

99. Ibid., i, pp. 280, 368. Two inscriptions in the Lahore Fort record this architect's work in 1617/18 and in 1631/2 (J. P. Vogel, in Journal of the Punjab Historical Society, iii, 1914-15, p. 67).

100. Ibid., i, p. 90-1; i, pp. 332; ii, p. 162, cf. p. 151.

101. Ibid., i, p. 152.

102. The evidence for any intended superstructure on the flat terrace is thoroughly investigated by J. P. Thompson in Journal of the Punjab Historical Society, i, 1911-12 pp. 12-30. Shah Jahan was not an admirer of Jahangir's palace and garden architecture which he considered 'old fashioned and of bad design' (E. Koch, Mughal Architecture, 1991, p. 84, citing Lahori, Badshah Nama).

103. Much however depends on whether Amir Khusru's report is to be taken literally. He says in 1318 that the walls in the palace at Tughlakabad were painted with gold and studded with iridescent gems (Nihayatul-Kamal. B. M. MS. 25807, fol. 472f.).


105. The Royal Palace had already been completed in 1617-18 under the supervision of Mamur Khan according to the inscription on the Maktab Khana, and Jahangir had taken up residence in 1620 (cf. Zafar Hasan, in Journal of the Pakistan Historical Society, i, pt. 1, 1953, pp. 15-23)

106. J. Pinkerton, Collection of Voyages and Travels, 1811, viii, p. 35.


108. W. Irvine, Storia do Mogor of Nicolao Manucci, 1907, i, p. 141.


110. The Travels of M. de Thivenot, tr. D. Lovell, 1687, pt. iii, p. 10. Already in 1485 in Gujarat, a chronicler tells us, a fountain and waterfall had been laid out in a garden by a man from Khorasan, 'an art previously unknown' in this province. This art was then learned surreptitiously by a local carpenter, Halu (Mirati Sikandari, tr. F. L. Faridi, n. d., p. 69).

111. Muhammad Saleh Kamboh, a contemporary historian of Shah Jahan says these two 'renowned architects of wonderful excellence laid the foundation after the pattern of an original plan which has never been seen by any one in any part of the world.' (S. S. Nadvi, in Journal of the Bihar and Orissa Research Society, 34, 1948, p. 78.)

112. The Mamluk Palace of Justice in the Citadel at Cairo was also a vast columned structure containing a marble pulpit-like throne. Here the Sultan's public audiences were held on Mondays and Thursdays for hearing petitions and administering justice in cases involving those belonging to the Mamluk class (W. Popper, Egypt and Syria under the Circassian Sultans, 1955, p. 21).

112a. We know that there was a plan of the markets of Baghdad; it was drawn on a large piece of material (al-Khatib, tr. Salman, p. 99).

114. Note that this type of city wall was known to the Romans; i.e. a pair of strong walls of masonry separated by a space of 20 feet with a filling core of earth from the ditches and loose rock well rammed, forming at the top a parapet walk. (Vegetius lib. iv. cap. 3; E. Viollet le Duc, *Military Architecture*, tr. M. Macdermott, third ed., 1907, pp. 8–9). Similarly in pre-Islamic Arabia at the Temple of Awwam at Marib dedicated to the Moon god Ilumquh the elliptical enclosure wall was of ashlar masonry with a core of sand and rubble filling (F. P. Albright, in *Bulletin of the American School of Oriental Research*, no. 128, 1952, p. 26).


115. In the *Badshah Nama* (Ms. fol. 456b) they are described as Aleppo mirrors set in the walls 'so as to bring into the interior a reflection of the river and garden'.

116. The cost of 50 lakhs of rupees derived from the taxes of 30 villages and rents from shops and *serais* (M. A. Chaghatai, in *Iqbal*, v, 1957, no. 3, pp. 82–95).


118. For full list of stones, names and wages of workmen, expenditure on various items, and some measurements, see H. M. Azeez Hassan, *A brief History of the Taj*. Agra, 1903, pp. 11–15, translated from 'an old Persian MS.' According to Qasim Ali Khan Afridi (1771–1827) a wooden model was first made before the Taj was begun. (Diwan-i-Afridi, 23a; J. Sarkar, *Anecdotes of Aurangzeb and Historical Essays*, 1912, pp. 148–9).


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Glossary

Arabic and other Islamic Architectural Terms

Ablaq: Particoloured masonry
‘Adod: Capitals
‘Akhkal: Proportions
Ala: Materials of construction
Amūd: Column
Anza: Spear-marker serving as orientation in prayer
‘Agd: Vault
‘Agd brukab: Cross vault
‘Agd mazahar: Barrel vault
Ard: Pavement
Ata: Wall

Bāb: Door, gate
Badana: Piers
Bah’r: Bands
Bahū: Central nave
Ba’ika: Bay
Balṭ: Paving, Portico
Banā: To build (bina’—construction)
Barshah: Barbican
Bathā: Town Square
Bayt: House
Bayt as-Salāt: Prayer hall, Oratory
Burj: Fortified tower

Daff: Tympanum
Dahliz: Passage
Dā’ira ‘ala: Horseshoe arch
Dakar u intā: Interlocking stones
Dal: Rib of a cross vault
Dar: House
Dar al-‘ilm: Academy of learning
Dar al-Imara: Government house
Darabizin: Balustrade
Daradj: Staircase
Dhirah: Cubit (about 22½ inches)
Dikka: Platform (for the clerics)
Djahs: Wooden centering for vault
Dor: Storey
Dqāqah: Dressed masonry

Fāsil: Space between two walls
Fāss: A piece in marble marquetry

Fass: Voussoir
Fisqya: Basin
Funduq: Merchant’s serai
Fusayfusā: Mosaic
Gabbay: Stucco worker
Ghalaq: Keystone
Ghatā bāb: Wooden lintel
Ghurfa: High chamber

Hadjar madaqq: Dressed stone
Hafr: Sculpture
Hammāl: Relieving arch
Hammām: Bath
Hāra: A section or quarter in a city
Haran: Sacred area, Portion of the house set apart for women.
Hasiri: Carved brick ornament
Hawd: Basin, tank
Hayr: A park for wild animals
Hēr: Wall
Hēmeh: Cross vault
Hōsh: Open space enclosed by wall

Imārat: Construction
Itān: Frame, border
Izār: Dado

Jamālūn: Barrel vault, gable roof
Jāmūr: Finial
Jāmī: Congregational Mosque
Jisr: Bridge
Juss: Stucco

Khandaq: Moat, ditch
Khān: Caravanseraı̈
Khānqāh: Monastery for Sufis (mystics)
Khassa: Shell
Kitābānī: Inscription frieze
Kursi: Chair
Kuttab: Primary School

Libn: Brick
Liwān: Hall
al-lukār: Mosaics of coloured tiles (Spanish alicatados)
Mabkhara: Finial of Minaret
Ma’dhana: Minaret
Madhal: Entrance
Madina: City
Madrasa: Theological college
Mafraas: Paving
Mahrūq: Wooden beam
Malqaf: A lantern roof or air shaft
Mamarr: Passage
Marā: Corridor
Manakib: Abacus
Manzah: Pavilion
Maq‘ad: Loggia above courtyard
Maqam: Small chapel with dome
Magbara: Cemetery
Maqsura: A screened area in the mosque
Maristan: Hospital
Mashhad: Sanctuary of a saint
Mashrabiyya: Lattice screen of wood
Mashwar: Council Chamber (in Maghreb)
Masjid: Mosque
Masār: Place of pilgrimage
Marqūma: Decorated
Mihrab: Arch or niche in the wall of the mosque which is toward Mecca
Miqa: Ablution basin
Mi’mari: Mason, or architect
Minbar: Pulpit
Mintaqa: Band
Mizrāb: Gutter spout
Mu’allaga: Arched, suspended (mosque)
Muallim: Mason
Mu’arrab: Interlaces
Mubāh: Veranda gallery
Muhandis: Architect
Muharrama: Carved
Mukarnas: Corbelled brackets and niches commonly called stalactites
Mulawwan: Polychromatic
Musalla: An open air place set aside for prayer

Nahar: To carve
Nah’r: Polyfoil arch
Najjar: Carpenter
Naqsh: Carved relief
Naqsh hadīda: Carved plaster
Niṣāb: Rafter

Odah: Room
Pishtaq: Frame or Frontispiece
Qā’a: Principal hall of house

Qabw: Vaulted passage or barrel vault
Qā’ida: Base of column
Qala: Castle
Qam: Relieving arch, flat arch
Qamariyya: Stained glass
Qanāṭir: Bridge
Qantarah: Arch supporting a flat roof
Qashāni: Glazed wall-tiles
Qasr: Palace
Qat’kaft: Balustrade
Qaws: Arch (aqd in the East)
Qayṣariyya: Covered Market
Qibla: Direction of prayer toward Mecca
Qūs ‘arabi: Pointed arch
Qūs maghbun: Segmental arch
Qūs rumi: Round arch
Qsarah: Plastering
Qubbah: Hall covered by a dome
Qurt’: Trefoil (arch)

Rabad: Suburb
Rafrafi: Cresting, eaves
Rafs el-aqḍ: Vault
Rahba: Square
Raqm: Ornament
Ra’s: Capital (or tāj al-ʿamud)
Ribat: Military settlement
Riwāq: Colonnade, portico, aisle
Rōzanah: Opening in roof or vault
Ruhām: Marble (white marble marmar)
Rukn: Pillars

Sabār: Covered passage
Sabil: Fountain
Saffaha: Glacis or talus
Sahn: Court
Sahrij: Large cistern
San’a: Art
Sandoq: Cenotaph
Saqf: Ceiling
Saqqātah: Machicolation
Sarir al-mulh: Throne
Sariya: Column (or Ist’awāna, in the East)
Šašiyeh Lintel (also hint and ‘atabeh)
Sath: Roof
Serdab: Subterranean room
Shādhirwān: Fountain
Shuraf: Crests
Slāh: Jambs
Simasa: Window (Spanish—ajimez)
Sitara: Forewall
Sollam: Staircase
Sotrat Charārif: Crenellated parapet
Sqifa: Vestibule  
Subbak: Window grille  
Suk: Ribs of a cross-vault  
Suma‘: Pier  

Ta ‘ama: Incrusted  
Tabaqah: Storey  
Tabiyah: Artificial building material of earth and quicklime  
Tabliya: Impost blocks  
Takiya: Monastery  
Talwin: Painting  
Taqah: Window  
Takhtabosh: Low reception room  
Tallaqah: Arrowslit  
Ta‘liah: A tower placed on an eminence  
Tanmiq: Decoration  
Taq: Arch  
Tarkiba: Cenotaph  
Tariib: Composition  
Tasgir: Floral interlaces  
Tastir: Geometric interlaces  
Tarma: Antechamber  
Tars: Incrustations  
Tawriq: Palmette ornament (Spanish azaulejos)  
Tawshihah: Spandrel  
Tazyin: Decorative carving  
Tineh: Mortar  
Tubzi: Rusticated dressing (...... ibzamleh—with a drafted margin)  

Watj: Façade  
Withaq: Chamber around a courtyard  

Zaiyan: To decorate  
Zawiya: Hermitage  
Ziyada: An enclosure surrounding a mosque  
Zullaij: Glazed tile (Spanish—azaulejos)  

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## Indexes

(The principle observed in preparing these indexes has been maximum utility rather than exhaustiveness.)

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AN OUTLINE OF ISLAMIC ARCHITECTURE

R. A. Jairazbhoy

This book is arranged according to the principal regions of the Islamic world rather than on the basis of chronology or building types. There are numerous books, mostly coffee-table books, on this theme but the present book is different. Its merit is in its reliance on ancient texts, and its focus on the important and seminal monuments of Islam so that development and evolution remain clear.

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R.A. Jairazbhoy has served ten years with the inner London Education Authority. He has travelled extensively and lectured on art and architecture in Pakistan and abroad. Before embarking on an extended lecture tour of Asia and Africa he was associated with the Indus Valley School of Art and Architecture in Karachi. An expert on the iconography of Islamic art, he has authored several books and contributed to various journals in the same genre.

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