PART I
The Historic Arab-Islamic City
Basic Principles of Islam and their Social, Spatial and Artistic Implications

"As far as architecture is concerned, it is the haven where man's spirit, soul and body find refuge and shelter..." [From an urban management manual by Ibn Abdun, an Andalusian judge from the 12th century]

In every genuine cultural tradition, architecture and urban form can be seen as a natural expression of prevailing spiritual values and beliefs which are intimately related to the acknowledged cosmic order of the world. Whether such a three-dimensional representation is intended explicitly, by “mirroring” the universe in the microcosmos of man-made material structures, or whether it is simply an outcome of traditions and daily practices which correspond to certain spiritual principles, is of secondary importance; it merely reflects the difference between consciously planned, often “monumental” works of art and the more modest vernacular architecture built by the inhabitants themselves or by anonymous craftsmen.

As a rule, there is a close interaction between what people build and what they believe, and this equation works in both senses: man structures his environment, while he is also influenced and confirmed by it in his attitudes as a result of interacting with it over time. This certainly holds true for traditional societies, where human activities were guided by distinct spiritual values which thus succeeded in permeating the whole built environment. “Tradition” means the chain of revealed truth, wisdom and knowledge, which is transmitted and renewed generation by generation, thus linking various successive layers of temporal existence to the primordial reality which originated them. All spiritually founded traditions – and Islam is one of them – aimed at materializing and manifesting their individual perception of universal truth, filtered through the “medium” of their own cultural conditions. Therefore, the various religious doctrines, in spite of relative differences originating from their embodiment in specific communities, times and places, do not necessarily exclude, but complement each other; they all represent particular aspects of a sacred universe or, in other words, different approximations to the supreme reality which can never be fully captured by man.

Compared with other religious traditions, the distinctive feature of Islam is that it has given birth to a comprehensive and integrated cultural system...
by totally embedding the religious practice in the daily life of the individual and the society. While Islam did not prescribe formal architectural concepts, it moulded the whole way of life by providing a matrix of behavioural archetypes which, by necessity, generated correlated physical patterns. Therefore, the religious and social universe of Islam must be addressed before engaging in the analysis of architectural structures. In doing so, we will limit ourselves to some of the essential issues, which – directly or indirectly – have conditioned the structure of the built environment.

Islam is the youngest of the three monotheistic religions which trace their tradition back to a common ancestor, the prophet Abraham, and all sprang up in the Middle Eastern area. It accepts its forerunners Judaism and Christianity as “religions of the book”, but sees itself as the ultimate confirmation of the primordial faith, restored by the revelation of the Prophet Muhammad, the last in the chain of prophets. Unlike Judaism, Islam does not believe in a chosen people as exclusive carrier of spiritual truth; and unlike Christianity it does not claim divine status for its founder. While Christ is worshiped as the son of God, Muhammad saw himself as the human transmitter of the divine message – the Qur’an – dictated to him by the Archangel Gabriel.

The existence of the Prophet Muhammad is a historic fact, and in this respect Islam benefits from an unbroken and genuine tradition. The Prophet was buried at his house in Medina, today the second holy place of Islam after the Ka’aba in Mecca. His own and his companions’ deeds and sayings were recorded by contemporary followers, as was the case with the Qur’anic revelations, which were memorized and recited during the Prophet’s lifetime, then fixed in written form immediately after his death. They have since continued to be recited by Muslims all over the world in their daily prayer.

Islam means the peaceful submission to Allah, the one and only Lord of the Universe, who has made man his vice-regent on earth, but who continues to control both worlds. Man was entrusted with the custody of God’s rule, but the Qur’an makes it clear that he should never assume the role of the Lord, for he is only the instrument of His supreme and unscrutable will. Ontologically speaking, all human beings, regardless of their relative status in worldly terms, are therefore considered servants of the sole God. This reduced to a considerable extent the relevance of earthly hierarchies by marking them as accidental and revocable distinctions, and at the same time it stressed the equality and solidarity between human beings.

On the one hand, the Qur’an emphasizes that Allah is beyond the limited human capacities of imagination and that nothing should be directly associated with the idea of God, in order to preserve the purity of the Divine. “La ilaha ill’Allah” (no Divinity but God) is therefore the prime credo of
Islam, coupled with the recognition of the Prophet Muhammad as messenger of the revelation. On the other hand, the Qur'an again and again stresses the omnipresence of God within his creation: His forces permeate the creation and manifest themselves in the countless "signs" (ayât) of nature, which should induce man to reflect on the omnipotence of Allah. God is therefore seen as both transcendent, i.e. above all rational or material explanations, and immanent, i.e. inherent to his creation and therefore perceivable by virtue of symbolism and analogy. As his presence can be felt everywhere on earth, the world as a whole participates in the sacred character of the creation. Yet man must beware of identifying God with his limited perception of Him and should avoid any attempt to seize and fixate the divine in human artefacts. Accordingly, it is a major concern of Islam to maintain a clear distinction between the two levels of existence, one being the human or temporal realm, the other being the Divine or timeless realm. Blurring the division line between them is considered a blasphemy.

Nevertheless, both spheres are always seen in close interaction: while Islam emphasizes the uniqueness of God, it also affirms the fundamental oneness of His creation, which ultimately implies the unity of both worlds. Similarly, the Prophet insisted on the transcendent nature of the Divine, but this did not prevent him from acknowledging and accepting human factors. Wordly concerns, motives and desires were in no way ignored, belittled or condemned, but rather transcended by their integration into a comprehensive religious system, the prime objective of which was to interconnect the temporal and the timeless, the earthly existence being seen as a transient emanation of eternal life.

One could say that the strength of Islam lies precisely in this interconnection of both worlds, which operates and is expressed in very practical terms. The Qur'an – in the eye of the Muslims the word of God – contains prescriptions and recommendations which are directly related to the daily life of the first community around the Prophet and are still followed by millions of Muslims. Similarly, the Prophet Muhammad, by virtue of being a human receptacle for the Divine message, became the supreme model of the "universal man" for all later Muslims, especially as, besides being a man of God, he also led his earthly life as head of his family, as political and military leader and as ruler of the first Muslim community in al-Medina. Therefore, not only his ethics and his teachings but all aspects of his actual behaviour in life became significant. Accounts of his character, his sayings, his deeds, his reactions in specific situations were collected and constituted a complete philosophy of life which covered all aspects of human experience, from the sublime to the mundane and from the intimate to the public sphere. These accounts of the "sunnâ" (habits) of the Prophet became
exemplary for all later Muslims, thus leading to a veritable "imitatio propheticus" which was instrumental in shaping the character of a Muslim society. Together with the Qur'an, they served as sources for the constitution of more formalized compendia of orthodox Islamic law.

The new Islamic law was established during the 8th/9th century AD, about 200 years after the death of the Prophet, at a time when Islam had expanded well beyond the Arabian Peninsula, absorbing the heritage of the late Roman, the Byzantine and the Sassanian empires. Obviously, major cultural and political changes took place, as the small original community of al-Medina, ruled by the Prophet and the first four rightful "Khalifas", i.e. his appointed vice-regents (Abu Bakr, Umar, Uthman and the Prophet’s son-in-law Ali) turned into a major empire, with Damascus and Baghdad as its new capitals. According to Ibn Khaldun, the famous Maghrebi historian of the 14th century, the "period of miracles" and the original unity forged by the Prophet had given way to the normal course of life, marked by inevitable political and religious struggles, such as the division between Sunnite and Shi'ite Muslims. The later caliphs were shrewd political leaders but unable to fully match the model of the Prophet and his first successors. Powerful tribal and military leaders (sultans) had emerged, who were to secure the Islamic dominion, but did not always act according to religious rules. Finally, large masses of non-Arab populations had converted to Islam, asking to have their share in cultural, religious and political matters.

In this situation, the formation of Islamic law (Shari‘a) became the tool for safeguarding the Islamic identity of the empire and ensuring the religious "unité de doctrine", which was needed to establish the cultural coherence of Islam in a rapidly changing world. Interestingly enough, existing Roman models which had contributed a lot to the new material civilization of Islam were completely discarded when it came to the question of law and justice. Instead, a deliberate return to the origins took place, by going back to the first community of Medina for guidance and reference. The precepts from the Qur‘an, complemented by an interpretation of the deeds and sayings (Hadith) of the Prophet and his first companions, thus became the prime sources of the new Islamic law. For cases where no direct reference was found, conclusions by analogy were permitted and, failing that, the individual search (ijtihad) and the consensus of religious leaders could be called upon. The creative period of Islamic jurisprudence ended when the "door of individual search" was closed and the four established orthodox schools of law became canonic. Later generations confined themselves to an interpretation of the then existing stock of secondary sources.

Due to the character of its sources and its objectives, Islamic law differs considerably from Roman law, which continued to serve as a basis for most
European legal systems. Firstly, Islamic law constituted a religiously based, not a secular compendium of prescriptions. Secondly, it did not originate from abstract principles but from the live experience of an exemplary society. And finally, its main concern was not to settle economic and social disputes, nor to define a rigid penal code, but to promote an exemplary pattern of individual and collective human conduct. It was therefore not limited to "negative", i.e. restrictive regulations, but implied a complete "positive" system of human behaviour (including a codex of good manners), which was highly ritualized. The resulting body of religious and social customs became instrumental in shaping and preserving the social identity within the whole Muslim "umma", or mother-community (a virtual extension of the first nucleus around the Prophet in al-Medina) and conditioned what could be called an Islamic "liturgy of daily life". In a certain way, the comprehensive social rules of Islam may even be compared to those of the monastic orders in medieval Europe, except for the fact that orthodox Islam never accepted the dualism between the "spiritual" and the "material" realm and never introduced a distinct class of clergy or any special preconditions for a contemplative life, such as celibacy. Therefore, it can be said that the "monastic" aspect of Islam was diffused and integrated into society as a whole.

The constitution of Islamic law, and later its development and daily application, was the responsibility of the "ulema", the religious leaders of the community. Thanks to their knowledge of the sources and their special education, they acted as trustees of Qur'anic law and custodians of the social life of the community. While, over the centuries, Islamic law may have become somewhat sophistic and dogmatic, its great merit was that it represented a direct deduction from divine rules and prophetic models. It set an exemplary yardstick of ethics and justice which could not be corrupted by arbitrary human interventions and preserved the ontological primacy of the Lord as the real ruler and the only legislator of the community. From the beginning, Islam had excluded the concept of sacred kingship, as it was common in Asia, and even during the European Middle Ages. No caliph or sultan was ever bestowed with legislative authority, and the role of the Islamic ruler was only to "promote the right and to prevent the evil" in accordance with the given Islamic law which he had to implement.

During the later period of Islam, when it was no longer possible to combine spiritual and political authority in one person, this religious limitation of regal power became extremely important. The sultans usually established their political supremacy through a ferocious natural selection process which was hardly in line with religious ethics. Therefore, the pre-established Islamic law, the so-called "street of the believers" (shari'a), was a useful corrective against potential excesses of princely power and ruthless worldly
leadership, and became the main tool that was used to warrant the intended unity between religious and worldly matters after the integral leadership practised by the Prophet and his first successors had been broken.

Obviously, this system also enhanced the role of the ulema and of religious sheikhs, who came to rule the daily life of the urban community. The leading “civil servants” of the traditional Muslim government, such as the kadi (judge), the mufti (expert in religious matters) or the muhtasib (market inspector) were taken from the ranks of the ulema, as were the teachers in the mosque and the secretaries of the ruler. Being rooted in the local urban society, the ulemas could legitimately represent the population. This fact, combined with their spiritual authority and their wide network of social connections, enabled them to counterbalance the rulers’ interests wherever they went against those of the community. Occasionally, they could also mobilize public resistance in the mosque and the market against unpopular decisions by misguided rulers, which enhanced their negotiating powers.

The special character and the practice of the Islamic religious order could not but influence the corresponding social structures and living habits. These were in turn clearly reflected in certain spatial preferences, basic urban layouts and artistic concepts, which shaped the physical appearance of the Islamic built environment. The following paragraphs will address these influences in greater detail, acknowledging that they occur on a pre-formal level, so to speak, which does not fully define all formal aspects of Islamic culture but strongly conditions the inner structure of its urban and architectural expressions.

The social implications of the religious practice of Islam are perhaps most evident in the so-called “five pillars of faith”, which include the basic affirmation of faith (shahada), prayer (salat), almsgiving (zakat), fasting during the month of Ramadan, and the pilgrimage to the Ka’aba (hajj). Prayer is recommended to be done collectively wherever possible, five times a day. On Friday noon it brings the whole local community together in an event which has strong social and even political connotations. The sequence of the five daily prayers structures the life of the community and consequently the course of commercial activities in the city. The physical act of prayer itself, with its prescribed bodily movements and its orientation to Mecca, has distinct spatial implications, which will be addressed when describing the structure of the mosque. Almsgiving is a duty with obvious social benefits and traditionally involved at least four percent of each individual’s yearly income, as a kind of religious tax. The daily fasting from dawn to sunset during the month of Ramadan is a major collective effort and thus a social event which reverses people’s daily life and calls for a set of related reli-
gious and social festivities, culminating in the "Eid-al-Tabir", the smaller one of the two major Islamic holidays. The pilgrimage to Mecca unites believers from all over the Muslim world in the heart of their religious cosmos after a long and tiresome journey from the "periphery" to the "centre". It thus provides them with a unique geographical, social and human experience of the Islamic community (umma). The pilgrimage ceremonies in Mecca last for several days. They include first the gathering of the pilgrims in the plain of Arafat, then the mass procession towards the inner city of Mecca, with intermediate stations where ritual duties have to be fulfilled, and finally the circumbulation of the holy Ka'aba. The concluding ritual sacrifice on the last day marks the end of the pilgrimage and is celebrated by Muslims all over the world as the "Eid al-Kabir". It is the major religious festival of Islam which unites and centres the whole community by allowing it to participate in the ceremonies performed by the pilgrims at the heart of the Muslim universe.

Its emphasis on community matters, combined with its concern for social harmony and formalized human interaction, gave Islam a distinct civic character and made it, at least potentially, an urban religion. No doubt, its original background was the tribal society of the Hejaz with its Bedouin

2 The tent city of pilgrims gathering in the plain of Arafat during the Hajj period (from Snouck Hurgronje, around 1890).
roots, yet urban culture was not unknown in Arabia (especially in the southern part of the peninsula), and intensive trading had kept the Arabian tribes in contact with some of the major urban centres of the Near East long before the times of the Prophet. Eventually, Islam sustained the early revival of urban civilization all around the Mediterranean in the conquered former Roman provinces, including Syria, Egypt, Spain and North Africa. In this respect, the Islamic conquest compares quite favourably with the intrusion of Eurasian tribes into the northern provinces of the later Roman empire which in effect led to a century-long cultural collapse in central and northern Europe.

Perhaps the most significant social implication of Islam was the fact that the strength of its ritualized living patterns dispensed with the need for many formal institutions. A large number of administrative structures which are normally identified with cities – at least in Europe – did not develop, simply because the society had internalized its structuring constraints, which minimized the need for external controls. Its coercing mechanisms worked from within, so to speak, and needed little or no institutional support. Traditional Islamic cities had no municipalities comparable to those of the Western world, and the Crown and the Church in the institutional sense of Medieval Europe did not exist. Hence, the Muslim "res publica" was not the result of civil rights wrested from oppressive authorities but the outcome of the shared desire to follow certain religiously prescribed patterns of life which would hopefully provide man with peace and welfare in this world and salvation in the next world.

The only Muslim institution which combined certain aspects of royal patronage, religious domain and civic functions was the establishment of religious endowment (waqf, plural: awqaf). It was based on pious donations by the powerful and the wealthy, which were given for a social purpose and became forever the inalienable property of the community, administered by the kadi. These donations could consist of funds to build and/or maintain social welfare buildings such as mosques, schools, baths and fountains (which were sometimes combined with the tomb of the sponsor). Or they could consist of land, commercial facilities or houses, the returns from which were allocated to social welfare purposes. Since they were inalienable and could accumulate over centuries, waqf properties eventually covered large parts of urban real estate. In practice, the institution of the waqf thus provided the public funds which were needed to finance and to run the public domain of Islamic cities. It also strengthened the role of the kadi as the responsible representative of the community, especially vis-à-vis the ruler, who was not entitled to use the accumulated funds for his own purposes.
The absence of dominant civic institutions in the Islamic city increased the need for social consensus and the importance of certain mechanisms of human interaction. A set of implicit rules and conventions known and accepted by everyone helped society to maintain a self-regulating inner balance. The kadi and the muhtasib, the ulema, the sheikhs of the various professional guilds and the heads of the major family clans and ethnic groups were instrumental in achieving and maintaining this balance. Their relations with the ruler were based on a kind of implicit social contract, which had to be confirmed every Friday by quoting the name of the ruler in the official prayers. In cases of conflict, the urban community could manifest its discontent by abstention from the official prayers or by collectively shutting the markets, both of which were clear warnings to the ruler.

Physically, the lack of formal institutions resulted in the absence of outstanding government buildings such as city halls, courts or audience halls and related formal open spaces. Most of the institutional functions were fulfilled by the Friday Mosque, the prime public building, which, in line with the Islamic philosophy of life, had not only religious but all sorts of political and social functions. Embedded as it was in the framework of the central markets, the mosque seldom took monumental forms (as European cathedrals did), except in cases where the prestige of royal sponsors was involved. While being the major religious building, it usually remained a polyvalent structure integrated into the urban fabric, with no intention of expressing the power of religious or secular authorities.

Another consequence of Islamic society’s inbuilt control mechanisms and the corresponding absence of institutions was the redundancy of planning in the modern sense of the word. Most traditional Islamic cities, with the exception of royal palace cities, followed an “organic” pattern of growth, marked by the presence of certain archetypes of built form which acted as architectural “seeds”. Such archetypes could develop a wide range of related physical shapes according to site constraints, community size, economic resources, building materials etc., as will be described in the following chapters on the components of urban form. Due to this common origin and mutual affinities, the resulting buildings, i.e. houses, mosques, public facilities, caravanserais and markets, could combine into larger structures in an unforced and quite natural manner. The commonly accepted rules of building, as determined by the codex of social behaviour, did away with the need for central planning; combined with the casual freedom of individual variations, they resulted in the striking balance and homogeneity of the Islamic townscape which is so different from planned uniformity.

Paradoxically, it can be said that it was the highly formalized way of life which allowed for relatively informal urban layouts and a corresponding
freedom of individual architectural expression in the Islamic city. The relaxed attitude (or even hesitance) with regard to formal modes of planning is based on the consciousness of well-defined individual and social duties, as fixed by religious conventions. In addition, it also reflects the conviction that the plans of the Lord can only be executed by inspired and co-ordinated actions of living human beings. Islam never believed in the intrinsic value of "dead" institutions founded and controlled by man for his own purpose. In harmony with its basic tenet ("La ilaha ill'Allah"), it was inclined to let God be God and man be man, i.e. to respect God's prime control over human matters without attempting to interfere with heavy artificial structures, as these may end up restricting human freedom rather than enhancing it. The fact that Muslims were aware of the provisional and transient character of human establishments made them accept more easily certain shortcomings and imperfections inherent to man's worldly existence. The effects of this attitude can easily be observed in the physical structure of the urban environment.

The visible physical expressions of any given traditional culture are essentially defined by the way it chooses to deal with the sacred in spatial, architectural and artistic terms - the sacred being the supreme reality which generates, conditions and permeates the various layers of the material world. In the case of Islam, one can observe an obvious reluctance against any attempt to capture and contain the divine qualities in any material spaces, structures or images. While the dangers of idolatry certainly are of concern, the overriding idea is to maintain the direct and effective linkage between God and his creation. As the Qur'an emphasizes again and again, God is transcendent, but also immanent in every single feature of the created world. Nature and man are signs and reflections of His power, and therefore the beauty of creation is to praise and to mirror His excellence. However, any human endeavour to constrict and isolate the sole creator's attributes into places or objects shaped by man would necessarily curtail their real power and disturb the divine order. In addition, it would represent an arrogant and fallacious attempt to compete with the only bestower of life (Qur'an XVI/17).

The most conspicuous confirmation of this attitude is the character of the prime sacred place of Islam: the Ka'aba with its inlaid "black stone" is not a monument in the conventional sense of religious architecture, but literally a cube marking the focal point of a cosmic system both in the geographical and in the spiritual sense. Its simple geometric volume is a condensation, as it were, of the physical world, with its faces relating to the six primary directions of the earth - the zenith, the nadir and the four cardinal points. Sym-
bolically, it represents the intersection of the human world with the celestial spheres, both being connected by the vertical "axis mundi" around which the rotation of the universe takes place.

Thus the Ka'aba is the transmission point between the eternal and the temporal world. By the ritual act of circumambulation (tawaf), one experiences bodily the essence of the centre and participates in the harmonious movement of the universe. This experience is of an existential nature. Accordingly, the Ka'aba is not venerated as an idol or as a significant work of art but as a source of strong spiritual energies which emanate from the cosmic centre and manifest the divine presence on earth. For this reason, it is also called the "House of God". Following an old Semitic tradition, it is wrapped with a black cloth which protects its holiness and prevents human beings from being exposed to the unfiltered impact of the sacred.

Being the radiating spiritual centre of Islam, the Ka'aba creates a magnetic field, so to speak, which extends through the whole of the terrestrial sphere. This allows Muslims anywhere in the world to evoke the divine and to communicate with it, simply by facing to the cosmic centre of the Islamic universe. The orientation towards the Ka'aba, as achieved by the
“qibla” direction, confers to each respective place of prayer a potentially sacred character, which is maintained during the ritual act. The holiness of a space is therefore not bound to the spell of a specific building but can be produced anywhere by symbolic representation – a philosophy which matches the Islamic idea of the omnipresence of God: “God has blessed my community by giving it the face of the whole world as a sanctuary”, as the Prophet said.

The spiritual charge bestowed by the qibla on any given place is complemented by the ritual consecration of man before performing the religious act. Islam has formalized this consecration by the state of “ihram”, which is imposed on pilgrims visiting Mecca. It requires that pilgrims exchange their normal dress for just two pieces of simple seamless cloth (to be worn around the hips and over one shoulder), in order to underline the passage from the temporal into the timeless order during the days of the Hajj. Thus, all worldly differences between the believers are extinguished to remind all men of their primordial status as “servants of God”. Another type of consecration, pertaining to the daily religious duties, is the prescribed sequence of ablutions which precedes every act of prayer. It consists of a cleansing of the head and limbs or of the whole body (according to circumstances) with clean running water – the Qur’anic sign of eternal life. Symbolically speaking, the ablation releases the believer several times a day from his temporal condition and concerns, allowing him to enter a state of purity from which he can communicate with the spiritual world.

Necessarily, this particular concept of experiencing the sacred and dealing with it in spatial and physical terms had important repercussions on the architecture of Islam. Unlike a Christian cathedral or a Hindu temple, the mosque is not seen as a sacred place per se but simply as a polyvalent assembly space which can be enhanced for religious purposes by virtue of the qibla orientation and the ritual act of prayer. It is thus invested with sacredness by delegation, as it were, which also means that the presence of the sacred is not limited to religious structures but is potentially available in every place or building. This fact, which is consonant with the absence of a formal priesthood in Islam, has greatly influenced the spatial articulation of Islamic cities. Consecrated spaces are by no means exclusive and are not subject to social and spatial hierarchies in the urban system, nor are they limited to specific types of architecture. Accordingly, the notion of sacredness could be extended to social and architectural domains other than the mosque, and particularly to the family and its home.

Although marriage, being considered as a social matter, is not given sacramental character, Islam qualifies the private sphere of the family as “hurm”, which means sacred and, in this case, both inviolable and ritually
forbidden to strangers. The related word "haram", which is often identified
with the secluded female section of a house or palace, therefore has a much
wider religious connotation, which is also expressed in the previously
described state of "ihram". The special status of the family unit (bait), seen in
both social and architectural terms, is underlined by the fact that the family
head acts as the "imam" (i.e. the responsible religious leader) of his domest-
ic community, which makes the cell of the house virtually independent from
any intermediate civic or religious institution.

The Islamic approach to religious and social institutions, combined with
its high appreciation of tribal structures and the family clan, therefore gave
rise to a particular concept of sacred space. On the one hand, the religious
building of the mosque is fully integrated into the social life and the archi-
tectural fabric of the town and fulfills comprehensive civic functions. On the
other hand, the private home has acquired a degree of sacredness which is
probably unique in comparison with other civilizations. Accordingly, it can
be said that the sacred within the Islamic city does not stand out in concen-
trated and isolated form but spreads over the urban fabric as a whole – not
unlike the multitude of fountains which give life to the many houses and
mosques of the city. Totally immersed in the cellular structure of the town, it
imbues man’s built environment with a continuous remembrance of the
divine, without ever confusing the timeless and the mundane.

The physical effects of this attitude are visible in the homogeneous and
yet highly differentiated structure of traditional Muslim cities. While the archi-
tectural fabric tends to be continuous, i.e. undisrupted by massive free-

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6  The ablution fountain in the courtyard of the Qairawiyin Mosque in Fez.
7  Aerial view showing the Qairawiyin Mosque in Fez embedded in the urban
    fabric.
8  The continuous rooftops of the old city of Isfahan, from the prayer hall of the
    Friday mosque to the covered market and an adjacent caravanserai.
standing religious or public buildings or by major open spaces highlighting individual monuments, it also shows a clear internal differentiation into a series of self-contained cellular compartments, which allow the private or sacred character of individual spaces to be protected where and when needed. As a rule, the public spaces lack the rigid layout which is imposed by highly formalized institutions, allowing for a high degree of interaction between various social activities, including religious functions. The mosque, as the main public core, is usually embraced by markets, and together they form a coherent architectural complex. As the prayer space has to meet special requirements of cleanliness, it is always neatly defined, and marked by gates and thresholds where visitors take off their shoes. The transition from the secular to the sacred spheres, both contained within the same public section of the urban fabric, is accomplished by a few steps, which allows for easy interaction between the mosque and the market.

Meanwhile, the residential districts are shielded off from the main streams of public life. The houses, often closely knit together, or built wall to wall in the case of courtyard structures, form inward-oriented autonomous units which are protected against visual intrusion from the street or from neighbouring buildings. The access from the public areas to residential quarters is usually tortuous and broken into successive hierarchical sections which herald increasing degrees of privacy. Dense residential quarters tend to swallow the street space and to convert it into private access corridors. Thus, the sanctuary of the house is not directly exposed to alien influences: it can assimilate the external world after the circulation has been gradually filtered by various intermediate sections of the street network. Dead-end alleyways and a progressive sequence of gates and thresholds are the preferred tools for achieving this protection, which preserves the “aura” of the family sphere and prevents frictions with the public realm.

9 A main alleyway in a residential district in Fez, with a gateway leading into a semi-private dead-end alley on the left side.

10 Inside a dead-end alleyway, looking towards the entry gate.

11 Typical structure of a cluster of courtyard houses around a ramified dead-end alleyway.

12 Typical structure of a residential district in North African cities, composed of individually accessible cluster-units.
In accordance with this spatial logic, the public street network of traditional Islamic cities was reduced to the sheer minimum required to provide connections between the main city gates and the central markets and to ensure the selective accessibility to private quarters. The major circulation streams were deliberately channelled around the "islands" of ritually pure space and protected private domains, so as to avoid an inappropriate mix of activities. Public open space was detached from the main arteries in order to differentiate it according to specific uses and to integrate it into corresponding public buildings, such as mosques, madrasas and caravanserais. Available open spaces in the residential areas were absorbed by the housing clusters, where they emerged in the form of enclosed courtyards which often became the core of individual dwelling units, allocated to well-defined social purposes.

The clear attribution of open space to specific social and architectural entities meant that there was no "anonymous" ground to be managed by public institutions. Since Islam conceded a large amount of autonomy and responsibility to various social groups within the society, city planning in the modern institutional sense was practically absent. The groups, whether family clans, foreign ethnic communities or professional corporations, were always allowed to take charge of the respective sections of public open space running through their "territory", in both residential districts and market areas. Former throughfares were often deliberately interrupted to cut direct access and privatize the street space. Since the definition of private territorial identities was so dominant, this led to the absence of representative civic space in the Western sense, and also to the lack of undefined public open space which, if it ever existed, tended to be neglected or rapidly appropriated for other uses.

These religiously sanctioned ways of dealing with public and private space resulted in townscape principles very different from those of the classical European tradition. Except in palatial cities, there was little or no intent to impose formal planning principles through the street layout by creating large avenues, representative public spaces and rational land subdivisions. The prevailing attitude was to transform anonymous (quantitative) space into personalized (qualitative) space by defining and enclosing a multitude of self-contained individual volumes and developing them from within, in ways which made them virtually autonomous. The coordination between single units occurred implicitly through the inner affinity of their structuring principles, and not through outer geometric arrangements. Buildings thus tended to become architecturally self-sufficient, imposing their law on the street system rather than depending on a predetermined circulation layout. With the composite growth of such individual nuclei, public space was often
constricted or reduced to a kind of interior corridor system, framed by adjacent buildings and leaving no loose residual spaces. The internal structuring system of residential units followed similar principles: rooms were not created by mechanical subdivision of the available space but by a cellular aggregation process, which allowed the main reception rooms to become almost autonomous, self-centred shells and create “houses” within the house, so to speak. The internal circulation system of the whole housing unit was subservient to this principle and had to adjust to the access requirements or restrictions imposed by the shapes and functions of the main rooms.

The structuring laws of both the house and the city were thus based on progressive differentiation of “interior” niches from “exterior” spaces, the notion of “interior” and “exterior” being relative values within a large spatial spectrum which ranged from the small private room to the complete urban structure. The resulting cellular structure of the house and the city was predicated on the “wholeness” of each self-contained unit, regardless of its relative position in the urban system. The outcome was the typical multi-focal pattern defined by the countless “centres” of individual buildings rather than by a rational grid of streets and squares. Yet the morphological homogeneity of that pattern allowed the multiple individual forms to merge into a lively and highly differentiated architectural unity.

While the analysis of urban structures may reveal a number of basic cultural shaping factors, as filtered through social models and corresponding architectural patterns, the visual arts are perhaps the most transparent manifestation of the guiding spiritual principles. To be sure, the genesis of Islamic art could not draw on explicit religious prescriptions or recommended artistic practices. Moreover, in the early centuries it was heavily influenced by the cultural heritage of Byzantium and Iran, as well as various tribal traditions from Inner Asia to North Africa. Yet it was Islam which established the spiritual parameters within which the assimilation of the various inherited elements could take place. This assimilation process occurred in full strength during the 8th/9th centuries AD, quite in parallel with the formation of Islamic law. Both processes reflected the desire of the Muslim community to articulate a framework of life consistent with its essential beliefs.

The intent and the character of Islamic art can best be appreciated by referring again to the central guidelines of Islam. In accordance with every traditional (i.e. religiously inspired) art, its main concern is to express and translate its own vision of spiritual reality. As stated earlier, this supreme reality, in the Islamic view, is nothing which could be captured in material works of art or images. God being the sole creator of life, man should not attempt to create artificial surrogates of reality. The only appropriate way to

13 The interior of the dome of the “Pavilion of the Two Sisters” in the Alhambra of Granada (13th/14th century).
deal with the divine forces was therefore symbolic representation. While the artist could never grasp the essence of creation, he could allude to it through his works, so as to raise the mind of the viewer to the state of contemplation which is required to approach the mysteries of creation and to perceive its hidden unity, unfolded in the wide spectrum of its manifestations.

For Islamic artists and craftsmen this task meant exploring the intermediate realm between spiritual ideas and material representation: on the one hand they had to appeal to the visual sense, as the eye is the organ through which the inner meaning of art is carried to the human intellect; on the other hand they had to stay away from naturalism, which would have betrayed the transcendent character of the message. This attitude corresponded to the paradoxical goal of Islamic art, which was to pursue the dematerialization of physical reality, while at the same time seeking the embodiment of the invisible reality. The best method of resolving this ambivalence was to remain on the narrow ridge between physical and metaphysical forms, that is, to capture reality in its vibratory state, as it were, before it solidifies into concrete manifestations.

Given the dominant symbolic and "non-iconic" orientation of Islamic art, it is clear that it never really cared about imitation of physical reality in the sense of post-Renaissance European art which, for centuries, was preoccupied with the development of illusionary representation techniques, such as perspective. From an Islamic point of view, such an approach was inadequate as it was bound to miss the real target of artistic creation and lead the artist astray. Even the Byzantine and Medieval concepts of the holy icon, although closer to contemplation, did not satisfy the requirements of Islam, as the essential character of both revelations was different: Christendom relies on the incarnation of God in Jesus Christ, and the narrative character of the Bible called for pictorial illustration. For Islam, however, the Prophet is a human being, and the only incarnation of God is the Qur'an as the holy book containing His message. Accordingly, the analogy to the holy icon in Islam is the acoustic or visual recitation of the Qur'anic verses or "ayat". Calligraphy was thus elevated to the status of a sacred art and came to play an essential role - not only in the arts of the book but also in architectural decoration and even in the adornment of crafted objects of daily use. It enabled Islamic artists to pervade the whole human environment with a permanent rhythmic reverberation of divine presence.

Besides calligraphy, the two other main tools of artistic expression cultivated in Islam were geometrical patterns and the so-called arabesque, which developed on the basis of the vine leaf scroll ornament inherited from late antiquity. Both arabesque and geometrical patterns were often interwoven, overlaid or juxtaposed with calligraphy to form frames and panels of

14 Calligraphy combined with arabesque and geometric patterns on a decorated wall surface (Fez, 14th century).
15 Interlaced stone layers in two masonry spandrels (Syria, 12th century), showing the influence of nomadic patterns (after Herzfeld).
continuous decoration. If the geometrical patterns of Islamic art represent the "static" face of creation, the arabesque incorporates its "dynamic" aspect, i.e. the natural growth and decay of all expressions of life or, to use Qur'anic images, the continuous unfolding and annihilation of the creation by the Lord. The evolution of arabesque was sustained by the impact of cultural traditions from nomad tribes, which repeatedly injected their vigorous sense of rhythm into the sedentary Islamic art. They also contributed their stylized or abstract way of rendering figural motives which, once freed of naturalistic forms of representation, could be easily integrated into the arabesque pattern.

The webs of geometrical patterns provided the most appropriate "illustration" of the supreme credo of Islam, which confirmed the intrinsic unity underlying the multiplicity and variety of manifested forms. In Islamic art, geometric figures are crystallized manifestations of the wide range of potential forms contained in the circle – the symbol of the origin and perfection of the universe. As they can be derived by geometric procedures from the basic elements of the circle, they are all interrelated and refer to an overarching common framework. Combination of individual geometrical elements can result in intricate ornamental networks which become complex and playful expressions of corresponding principles.

Through their complexity, such patterns assume a multi-dimensional character open to different interpretations: while each figure is balanced and contained in itself, it can also be read as a component of an endless continuing pattern, or as a composition of several overlapping or juxtaposed "centres" producing geometrical networks at various hierarchical levels.

16/17 Ornamental geometric patterns derived from subdivisions of the circle (after Issam el-Said).
18 Calligraphy and geometric patterns on the interior of the dome of the Barquq mausoleum (Cairo, 14th century).

19 The courtyard of the Madrasa al-Sahrij in Fez (14th century), an example of a perfectly balanced architectural composition, kept in suspension by the mirroring in the central pool and the transfiguration of ornamented wall surfaces.
The multifocal structuring principle, which also emerges as an implicit “leit-motiv” in composite urban patterns, found its purest expression in the lucid geometrical composition of ornamental networks. It not only overplays the divisions between self-contained geometrical elements but also transcends the scale attached to individual manifestations, making one realize that the small unit can stand for the larger one and that all are part of the same underlying order. By demonstrating how the macrocosm can be reflected in the microcosm, the ornamental art of Islam became a tool for the philosophical – or rather meditative – comprehension of the inner laws of creation.

While Islamic art favoured plane surfaces (such as walls, panels, arcades, lintels, etc.) for its use of geometrical patterns and arabesques, it also developed a three-dimensional geometric pattern which, through its intermediate character between architecture and ornament, became an important vehicle of artistic expression. The basic component of this three-dimensional adornment is the “muqarnas” – a small niche used in a variety of different sizes and composite aggregations. It probably originated from the subdivision of the Sassanian corner squinch, which was used to achieve a better transition from a rectangular base to the overarching cupola or, in other words, to smoothen the passage between plane and spheric surfaces. The precise history of the muqarnas has not been fully elucidated, but

20 The progressive development and refinement of Islamic arabesque, starting from the late Roman scroll ornament (after Kühnel).

21 A carved wood panel (Egypt, 10th century), showing stylized figural motives integrated into the flow of arabesques.
its rapid propagation and sweeping success throughout the Islamic world during the 12th century AD can only mean that it perfectly met the intents and desires of Muslim craftsmen of all provenances. Ever since, the muqarnas have become a hallmark of Islamic architecture. Their use was by no means restricted to the supporting corners of vaulted structures but became a ubiquitous decorative element, filling the interior of domes, the cavities of niches and the projecting edges of balconies and cornices with their so-called “stalactites” or hanging niches.

The deeper rationale for the indulgence in this decorative pattern was the ability of the muqarnas to overcome and transcend the sharp division between two geometric orders, that is the order of square (or the cube), and the order of the circle (or the sphere), the first one representing the static material world and the second one symbolizing the rotation of the universe around its immaterial point of origin. At the same time, the composite structure of imbricated muqarnas of different sizes created an interplay between ascending and descending hierarchies of forms, which blurred the perception of scale and dimension and therefore helped dissolve the impression of a heavy material reality. Similarly to the geometric patterns derived from the circle, the articulation and progressive subdivision of endless series of interrelated niches provided a non-figurative metaphor for the unfolding of creation and for the inherent unity underlying the multiplicity of generated forms.

Through its abstract and geometric character, the ornamental language of Islamic art became an integral part of built form, but while adorning and enhancing the architectural shell, it also invalidated the structural laws of the building, injecting a different dimension of reality into architecture. Far from being “decorative” in a superficial sense, the ornament could actually transform and transfigure a building, lifting it, as it were, into a realm where physical laws are virtually suspended and the structure becomes transparent for a more ethereal reality behind the material appearance. The veiling of architectural structures by the ornament – a recurrent device in Islamic architecture – was therefore meant to dematerialize the building masses and to reveal a hidden spiritual reality. This process is particularly conspicuous in the way the filigrane carved ornaments and particularly the honeycombs of muqarnas capture, absorb and reflect light, transforming flat surfaces into vibrant and luminous screens which seem to glow from within (see picture on page 41).

These few examples demonstrate that Islamic art was not just an ornamental by-product of a sophisticated material civilization but an essential and integral component of Islamic culture. Its malleable design language relied on being transmitted by the crafts, which made it applicable to and
compatible with all formal expressions of human life – from monumental public buildings to domestic architecture and to the humblest objects of daily use. As the inspiring, transforming and unifying factor of the built environment, Islamic art fulfilled a primordial role in the life of Muslim cities. Its ubiquitous presence served as a permanent reminder of spiritual reality and offered man a direct visual access to truth – an access which did not rely on abstract scientific theories, but on a refined sensorial experience appealing to the heart and to man’s sense of intellectual vision.
Environmental, Cultural
and Historic Shaping Factors of
Islamic Architecture

Islam emerged in a desert region and later occupied the large belt of hot and
arid zones reaching from North Africa to India. These areas were always
marked by a strong nomadic hinterland and prevailing tribal structures. The
given natural living conditions prompted specific environmental and
architectural responses which had their impact on Muslim architecture, as
did the nomadic background. While the growth of cities, spurred by the
cultural heritage of Rome, Byzantium and Iran, brought to bear a set of new
parameters, the urban civilization of Islam remained strongly influenced by
the nomadic roots of a tribal society.

The major achievement of the Prophet as a statesman was that he suc-
ceeded in uniting the dispersed energies of the Arabian tribes (which were
often spent on inter-tribal fights) and harnessing them under the auspices of
an overriding religious idea. In this process, archaic nomadic and tribal
concepts were not abolished but integrated into a more complex cultural
system, which eventually was strong enough to absorb and assimilate for-
eign cultural influences without losing its identity. Islam took over many
forms of ancestral nomadic thinking and behaviour, charged their archetypal character with a new symbolic dimension and perpetuated them by
religious rituals. This applies to many Islamic customs, such as the rites of pil-
grimage, the prayer movements or the way the floor surface is used for sit-
ting, praying and socializing. The veneration of water as source of life and
element of ritual purification may relate to the same origins. In general
terms, the whole spiritual "climate" of Islam, with its deep-rooted belief in
the transient character of this world, can be seen as influenced by nomadic
concepts. Even in the urban context, and up to the present time, the social
structures of Muslim communities have remained deeply imprinted by tribal
models.

Looking at the cultural history of Islam, nomad and urban ways of life
can be understood as different modes of the same existential status, one
more "liquid" and the other more "crystallized" in its consistency, but both
intimately correlated. Nobody has seen and expressed this complementari-
ty more lucidly than Ibn Khaldun, the Maghrebi philosopher of the 14th cen-
tury AD and author of the "Muqaddima" (Introduction to History). In his
fundamental book, he states that urban civilization, with its flourishing com-

24 A cultural archetype: an oasis within
the city and a paradise within the house
(garden courtyard in Marrakesh).
merce and the corollary achievements in the arts and in science, is the climax of every cultural development, but that it is liable to rapid degeneration unless it is periodically rejuvenated by the influx of fresh energies. He sees the nomad tribes as the carriers of the required unspoiled potential of strength, vigour and pride, which is continuously reproduced under the hard environmental conditions of the desert. This potential can only be released and fully materialized once the nomad tribes emerge from the shapeless sea of the desert to inject their vital forces into the islands of urban civilisation—which they will first attack and partly destroy, then rebuild and renew. The key agent of this process is the strong social cohesion (“asabiyya”) of nomad societies, as developed under desert conditions. It fosters strong leadership and group solidarity, qualities which are essential for building empires and cities (and for sustaining them over time), but which urban civilization is unable to produce by itself. To be able to flourish, cities therefore depended on the nomadic resources which, however, were subject to decay after several generations of sedentary life and therefore exposed to the thrust of subsequent Bedouin waves waiting for their historic moment to rise.

Ibn Khaldun thus understands nomad and urban societies to be closely interrelated and even interdependent, inasmuch as they are two components of a natural growth and decay process which nourishes and regenerates urban civilization. The potentially violent character of the cyclical encounters between nomads and sedentaries does not escape him, but he accepts it as part of the natural law of the survival of the fittest, especially with regard to the ruling dynasties. He also acknowledges the fact that the qualities most successful in dynastic struggles do not always conform with religious ethics. Yet a strong ruling class was needed to protect and support Muslims of urban societies and therefore political compromises had to be found in the interest of Islam.

This rhythmical interaction between nomad and sedentary forces has determined the course of history of the Muslim communities again and again. The migration and sedentarization of Arab tribes in the Fertile Crescent had already happened well before the advent of Islam, as witnessed by the earlier presence of Arab dynasties in Mesopotamia, such as the Lakhmids. With Islam, however, this movement gained a new momentum and led to the establishment of the first Arab-Islamic empire reaching from North Africa and Spain to Iran and Transoxania. During the Abbasid Caliphate (750–1258 AD), the security of the Islamic empire became dependent on the services of Turkoman slave-soldiers, who were brought in large numbers from the Transoxanian steppes. Their importance increased with the growing influence of Persian culture at the Abbasid court. With the est-
The establishment of the Seljuk dynasty (1040–1243 AD) the Turkoman tribes became a dominant power in the eastern part of the Islamic world. The Mamluk rulers of Egypt (1250–1515 AD) grew out of a selected and specially educated caste of warrior slaves, again brought in from Transoxania. Later, the tribal influx from inner Asia was continued by the Mongols and by the Ottomans, the former occupying Iran and India during the 13th and the 16th centuries, the latter succeeding the Seljuks in Turkey, and occupying parts of southeastern Europe, North Africa, the Fertile Crescent and the Arabian Peninsula. The Ottomans were the last Islamic dynasty of tribal origin and kept the nominal tradition of the Caliphate until the collapse of their empire in World War I.

In the western realm of Islam, similar waves of nomadic intrusion originated from the Saharan Berber tribes, resulting in the rapid succession of the Almoravid, Almohad, and Merinid dynasties between the 11th and the 14th centuries. In most cases, the cyclical invasion by Bedouin tribes caused considerable turmoil and even destruction, yet it was often also followed by political, artistic and even religious rejuvenation, since the invading tribes were usually freshly converted by a spiritual leader and their religious fervour gave new impulses to the “decadent” urban environment. It is conspicuous that the geometrical sense of Islamic art was repeatedly renewed and enhanced by this process in the Maghreb and elsewhere.
Besides violent invasions there was, however, also a continuous peaceful infiltration of the urban "milieu" by Bedouin and rural immigrants. The social structure of Muslim cities was dominated by family clans and tribal units which had their genealogic roots in rural or desert areas and often drew other clan members into the city. In addition, rural people from the surrounding hinterland tended to settle near the gates of the cities or form new rural suburbs, which gradually became more developed quarters "extra muros" as the population underwent the corresponding social urbanization process. This phenomenon, which was always present in latent form, has exploded in modern times, with waves of immigrants flocking to the cities in search of better opportunities.

The relative autonomy of clans and tribal units within the city found its most significant expression in the collective urbanization pattern of the "khittat", as applied in the early Muslim settlements and especially in the garrison towns of newly conquered areas in Mesopotamia and Egypt. These first Arab city foundations in Basra, Kufa and Fustat, occurring within one decade after the death of the Prophet, were carried out with the objective of sedentarizing the immigrant troops and their families. While in the beginning architecture was very primitive, probably consisting of tents and simple reed and mud structures, the organizational pattern of these settlements (related by the early historians al-Baladhuri and al-Ya‘qubi) was to become significant, if not typical, for later Muslim cities: the foremost act of city planning was the marking and enclosing of the common meeting and prayer place, which was to serve as the integrating factor for the various tribes, fulfilling both religious and political purposes. Sometimes this enclosure, which anticipated the later formal mosque, was equipped with a palm tree structure and simple shades on part of the surface to provide better climatic protection. In all likelihood, the side facing Mecca was marked with a more or less solid qibla wall. Close to this meeting place or "masjid" was the "dar al-imara", i.e. the seat of government, which was mostly attached to the qibla wall. In the open space around the masjid there were markets which developed spontaneously around the most densely used public spaces. It can be assumed that they initially consisted of informal tent structures, probably comparable to the rural markets which have survived in many Arab countries up to the present day.

It is interesting to note that these first settlements did not follow explicit geometric planning concepts and that, at least in the early times, they were not even walled. Beside the demarcation of the central core and the reservation of a number of major access lanes (reportedly forty spans wide), the remaining land was allotted to the various clans, tribes and ethnic groups for their own development. Planning authority was thus delegated to

26 Enclosed rural market area (Southern Morocco).
27 Typical semi-sedentary settlement in the Atlas mountains, composed of hedges enclosing individual spaces, which are filled with simple huts.
individual social groups which were responsible for the autonomous management of their allocated space. Within the given territorial boundaries, the definition of land usage was left to internal agreements, i.e. to the individual clans and families and their respective sheikhs. Each of these ethnic or tribal quarters had its own masjid to settle community affairs and to resolve internally whatever conflicts might arise from diverging development interests.

The khattat system can be understood as the prototype of later and much more refined urban development concepts. It demonstrates many typical features which continued to be applied in most Muslim cities, such as the relative lack of institutional control, the absence of predetermined formal layouts, the autonomy of the residential units and sub-units, the supremacy of private arrangements over public regulations, the indulgence with regard to private space encroaching onto public space and the reduction of the circulation network to a bare minimum.

Similar trends can be observed in the adaptive re-use of existing Roman-Hellenistic town structures by the new Muslim population. The prime examples of this transformation process are the Syrian cities of Aleppo and Damascus, where the two major public spaces, the old agora and forum in Aleppo and the former temple square in Damascus, were occupied by new mosques. Interestingly, these buildings - important forerunners of many later mosques - in certain ways merged the functions of the forum and the temple into one single facility. The viability of this combination was due to the changed concepts of religious practice and governmental authority pursued by Islam. The task was to bring together in one place related social, religious, administrative and representational functions by introducing a flexible and polyvalent use of space. This could be achieved by maintaining a large central courtyard, surrounded by shaded arcades on three sides and faced by a pillared hall in the tradition of Roman market basilicas. The building was to provide both covered prayer space and the audience hall of the ruler. It is not without deeper significance that the old idea of placing a religious monument in the centre of the space, as found in the layout of the Roman temple square in Damascus and later in the construction of the church of St. John that replaced the temple, was deliberately rejected.

An equally significant urban metamorphosis took place with the large central avenues of the Roman cities in Syria - the Via Recta in Damascus and the main spine of Aleppo, leading from the western gate to the Citadel. These avenues, representative of the civic pride of Roman civilization and symbols of the central authority in the provincial towns, had lost their ancient meaning and were no longer used by horse-drawn carriages, since the Muslim city had returned to a predominantly pedestrian circulation. Thus the available space in the shaded lateral arcades and in the central traffic

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28 The southern wall of the Umayyad Mosque in Damascus, featuring some of the original Roman stonework.

29 Plan of Damascus showing the original Roman-Hellenistic street grid superimposed on the later Muslim circulation network. (The black rectangular square corresponds to the temple square, which was later occupied by the Umayyad Mosque.)

30 Plan of the Umayyad Mosque in Damascus, built into the precinct of the temple square (see also page 106).
lanes was gradually occupied by merchants who started erecting booths along the main pedestrian flows – first as temporary, then as permanent structures. This process, which is consonant with traditional appropriation patterns in rural open-air markets, led to a number of narrow parallel pedestrian lanes framed by shops and eventually fostered the typology of the classical urban suqs.

In the residential districts, the orthogonal grid layout of Roman streets was to be gradually transformed into a much more irregular pattern. This change relied on the fact that the street layout in the private quarters was no longer controlled by a central civic authority and that individual houses, for reasons of family links, social convenience or simply lack of space, tended to grow together into larger clusters which interrupted, privatized or simply swallowed the existing street network. The result was an internalized access system with private corridors, dead-end lanes and cul-de-sacs, branched on semi-private residential alleyways which in turn provided connections with the main public thoroughfares and the markets.

The cases described are typical examples showing how continuous daily practice, rooted in ancestral customs, shared religious values and corresponding social rituals, can shape and transform a built environment. They also demonstrate how vernacular building patterns can interact with, supersede or integrate more formal architectural styles – a process which had a great impact on the evolution of Islamic architecture and its various regional expressions. Before addressing the influence of more monumental architectural typologies, which had their origin at the imperial courts rather than in rural areas, it is important to dwell on some of the basic concepts of vernacular architecture, which formed the solid trunk on which more hybrid branches of “historic” architecture were grafted.

Vernacular architecture in the Islamic world came forth as a perfect response to the living conditions of both the natural and the social environment, based on age-old regional experiences with local building material and appropriate techniques of climate control. Perhaps the best example to demonstrate this is the case of the courtyard building: the extreme climatic conditions prevailing in many regions of the Muslim world, ranging between cold winter nights and burning summer days, called for a tight architectural envelope with protected interior spaces, as independent as possible from the outside world. Incidentally, this requirement also matched the strong social and religious urge for a secluded private family space. The courtyard house, an age-old oriental invention already fully developed in the plan of the Sumerian city of Ur (around 2000 BC), responded ideally to these concerns. It was to become a timeless prototype of vernacular archi-

31 View of a model representing the historic city structure of Aleppo, with the Roman avenue transformed into covered suqs and the agora into a mosque (see also page 127).

32 Interior of the courtyard of the Umayyad Mosque of Aleppo.
Architecture in most geographic regions of the Muslim world. In terms of historic connections, it had already passed from the East into Roman architecture and was brought back again to the oriental provinces of the Empire, where more vernacular versions had of course survived throughout the centuries.

The basic architectural gesture of the courtyard house is the enclosure, which defines and qualifies a specific space, marks it with an individual identity and singles it out from the surrounding environment. In the context of Islamic architecture, the enclosure has become a ubiquitous feature which pervades the whole building repertory from the private house to the caravanserai and the mosque. Applied in both rural and urban areas, it emerges as the result of certain basic forms of behaviour in space, translated into corresponding architectural prototypes such as the tent, the village house or the

33 Berber tents in southern Morocco, during a local festival.
34 Domed dwelling units constructed within enclosed family courtyards in a rural area of northern Syria.
35 Imaginative reconstruction of the Prophet's courtyard in Medina (after J. L. Leacroft).
urban residence. Even the tent can be seen as an encapsulated personal space extracted from the infinity of the desert, as it were. Aggregated in larger compounds, tents often form circular enclosures protected by a thorny fence, such as the North African duars. There the tents become individual sub-units oriented towards a central courtyard. The same principle is to be observed in hard versions of rural architecture such as the so-called “bee-hive structures” in northern Syria or the farmhouses of the Maghreb, which were often built as mud-brick structures. The North African examples show the transition from circular to rectangular shapes, which allow for better integration of the single units into compact houses and thus pave the way for densified urban structures.

A specially significant prototype of the rural enclosure was the house of the Prophet in Medina, which he is reported to have built with his companions on an empty piece of land at the place where his camel stopped and sat down when he entered the oasis. The structure of this house could be reconstructed from narrations of contemporary eyewitnesses: it consisted of a simple walled enclosure and the large courtyard, surrounded by a number of dwelling units, walls and a simple shaded portico on one side, and was to become the centre of the first Muslim community and the functional prototype of all later mosques.

In many places on the edge of the desert, fortified enclosures were developed to protect people, livestock and commercial goods. This was the case of the caravanserais (khans), fortresses (ribat) and enclosed market places, which were built as strongholds and seminal points of sedentary life in barren areas. It equally applied to fortified forms of dwellings, such as the “kasbas” in southern Morocco or the tower houses of southern Arabia,
which reduced the courtyard to an air shaft or replaced it by a covered central room. Both included stables and storage room for grain and other food reserves on the lower floors.

Much of the later Islamic architecture can be seen as a refinement and further development of such rural prototypes, transposed to urban conditions. The enclosure is a recurrent theme which underlies most urban buildings, whether private or public, and shapes the layout of the city at various hierarchic levels of its internal structure. The connections to the rural origins were also stressed by the fact that many Islamic cities kept certain agricultural activities within their walls, including orchards and paddocks, and that the houses included corresponding storage and processing facilities. Often the urban population retained close bonds with related ethnic groups in rural areas, from where they attracted not only immigrants but also specialized skills and trades needed for construction and maintenance of the city.

Another "leitmotiv" of Islamic architecture intimately connected with the enclosure was the idea of the walled garden, which was congenial to people living on the edge of the desert and which, in hidden or overt form, interprets the Qur'anic image of the oasis turned into paradise. It is significant that Islam should have developed the concept of the celestial garden in contrast to the Christian idea of the celestial city or the heavenly Jerusalem (which was to inspire the Gothic cathedral). The Qur'anic images of paradise depict abundant water, fragrance and fruit trees and feature lofty

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36 Upper terrace level of a fortified family stronghold (kasba) in southern Morocco.

37 Detail of the staircase.

38 Plan and section of a kasba compound.

39 Aerial view of a fortified caravanserai and adjacent village between irrigated land and the desert in central Iran (G. Gerster).
shaded places, where the believers can sit in perfect peace and enjoy exquisite pleasures. (See, for instance, Qur'an 56/11-33 and 88/8-20). Such vivid descriptions in the holy book could not but appeal to the senses and the mind, and were certainly a source of inspiration for the wide range of formal and informal gardens in the Islamic world.

Historically speaking, the cultural and religious predisposition to the garden theme was met by the Iranian concept of the “firdaws” (paradise garden), which was introduced into the Middle East in the early centuries of Islam but can be traced back to the Achaemenid period. The traditional Persian garden is based on the “chahar bagh” concept, i.e. four garden sections enclosed by a wall and divided by two crossing water channels symbolizing the four rivers of paradise. It has greatly influenced most Islamic palace gardens, starting with the Abbasid palaces of Samarra, built in the 9th century AD. From there, the paradise garden concept migrated westwards, to Egypt, Andalusia and the Maghreb. In the East it was revived in Iran itself, especially under the Safavid dynasty, and taken over by the Timurids in Samarkand, from where it reached the Indian subcontinent under the Moghuls.

Such royal gardens could stand on their own, sometimes outside the city walls, and in this case they served as “reception camps”, featuring light pavilion structures only — as can still be seen in the Shalimar Gardens in Lahat.

40 Mughal miniature from the 17th century showing the emperor Babur supervising the construction of his walled garden.

41 Scheme of the palace district of Isfahan in the 17th century, with the main spine of the Chahar Bagh (A) leading to the bridge across the river (B) and holding together a series of walled gardens. The palace area, slightly tilted with respect to the gardens, is bordered by the “Meidan” of Shah Abbas (F), a large open space which also served for polo games. The Meidan articulated the interface between the gate of the Palace (G), the Shah Abbas Mosque (J) and the central market complex (K), linked with the Friday Mosque (M) by a bazaar spine (L).

42 Plan of the Shalimar Gardens in Lahore (17th century), showing the typical cruciform subdivision of “paradise gardens” by water channels. The lower square on the north, with the entry gate (A), was the public zone, the upper square in the south (B) served as the private garden of the emperor, and the intermediate level with the big pool provided the official reception area.
43 Pavilion over a fountain at the centre of a cruciform interior garden (riyadh) in an 18th century private mansion in Marrakesh.

44 Courtyard with central pool and musicians' estrade in an 18th century private house in Aleppo.

45 Sketch of a Moroccan interior garden (riyadh) by A. Laprade.
hore. Or they could be integrated into a more substantial palace structure, as was the case in the “Court of the Lions” of the Alhambra in Granada. In Isfahan, they extended into urban dimensions, forming the backbone, as it were, of the whole royal city of Shah Abbas. In Moghul India, pleasure gardens were often combined with the construction of a tomb complex which turned into a memorial place after the burial of its deceased patron or his beloved ones – the most famous example of this type being the Taj Mahal.

However, it would be erroneous to think that the paradise garden was confined to the realm of kings and princes. Descending from the courtly sphere to that of the urban bourgeoisie, it eventually became an immensely popular concept and was reproduced in smaller size in countless courtyard houses in many regions of the Islamic world. Even in its most modest form it made an essential contribution to the quality of life in Muslim cities.

It has been noted by cultural geographers that large-scale agriculture, as introduced by the Romans in their North African and Near Eastern provinces, was somewhat neglected under Islamic rule. In fact, peasants did not enjoy the same social status as merchants in the Islamic world, and regular farming was often compromised by Bedouin raids. Nevertheless, there was a definite impetus given to gardening, and in fact the wide geographical range of Islam and the regular trade connections to the Far East resulted in many exotic fruit and flower species being introduced into the western regions, including Europe. The traditional palm groves were often combined with orchards, using various layers of vegetation: the high date palms provided shade to the lower citrus trees, which in turn protected the ground cover consisting of spicy shrubs or flowerbeds.

Larger plantations, orchards and pleasure gardens were usually located at the same distance from the city, but could also be included within the city walls, adjacent to the urbanized areas. Smaller gardens could easily be integrated into the courtyards of individual houses. Their practical function, i.e. the yield of fruits, shade and climatic improvement, was combined with aesthetic pleasure and with Qu’ranic connotations of symbolic nature. This multiple benefit harmonizes with the fact that there was a joint religious and economic incentive for cultivating land: Islamic law considers the vivifying of “dead” land as a good deed to be rewarded, and the corresponding action, implemented on clearly abandoned ground, entitles the individual to ownership of the respective piece of land.

Water, too, had to fulfill a multiple function within the built environment of Islam: besides being an essential resource for survival in the most practical sense, there was also a religious and an aesthetic dimension attached to it, for it was the element of ritual purification and the symbol of eternal life. Within the palace, the domestic courtyard, the mosque or the walled
garden, it helped cool enclosed outer spaces and even the interiors. Together with the garden, it improved the micro-climate of the house, allowing the inhabitants to endure the hot summer months. But combined with an appropriate architectural and landscape setting, it also served as a source of sensual pleasure and aesthetic delight. To understand these special qualities one only needs to look at the sophisticated way in which the flow of water is celebrated in the many types of fountains, channels, ramps (salsabil) and pools all over the Islamic world. Compared with the fountains of Renaissance and Baroque gardens in Europe, water is displayed in a far more subtle and intimate manner. The soft bubbling of a spring in a pool, the rhythmical trickling of an overflowing basin, or the silver-like veil of water coating the stone surface are more evocative to the Muslim mind than the dramatic outbursts of large arrays of fountains. Hand in hand with the ornamental tapestries adorning architectural enclosure walls, gardens and water became key factors in producing that contemplative state of mind which, according to the Islamic philosophy of life, enables man to open a window into the realm of timeless existence.

Obviously, the garden culture in most Muslim countries would not have been possible without elaborate irrigation methods. These were also needed to cultivate fields, orchards and gardens and to supply water to the cities, including their mosques, public baths, private houses and industrial facilities, such as mills, dye-works and tanneries. In the geographical context of Islamic civilization, cities appear like islands in a vast sea of uncultivated

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46 Irrigated fields in the Algerian Saoura valley.

47 Irrigation channels passing under and between the houses of the city of Fez.

48 Distributor for irrigation of private fields in the Algerian oasis of Timimoun (after H. Imesch).
or barren land, connected by the caravan routes which replaced the paved roads of the Roman Empire. These routes were in need of well-distributed rest stations, combined with springs, wells or oases, to enable travellers to survive the journey. Here, caravanserais acted as outposts of urban civilization between the cities. Together with well structures and other facilities, they were usually built as pious foundations, especially along the trade and pilgrim routes leading to Mecca.

Irrigation techniques for urban settlements varied from place to place: wherever the geographical conditions allowed to do so, water was diverted from existing rivers and fed into a separate irrigation and discharge system. Equitable distribution mechanisms had to be devised to subdivide the flow of water according to socially agreed rules. In many cases land ownership was combined with precise water rights and specific water allocations. Cities located at the feet of mountains which were rich in springs and perennial waters often developed such supply systems to great perfection. The city of Damascus, for instance, lived in close symbiosis with its oasis (the Ghouta), which was fed by the springs of Mount Kassioun. Fez, against all strategic rules, was laid out at the bottom of a natural conch, which allowed for easy irrigation, using the incoming stream of the upper plateau and discharging it onto another riverbed at the bottom of the valley. In Cairo, water from the Nile was driven up by animal force to the top of a tower located on the riverbank, from where it was carried into the city by a large aqueduct. This was a monumentalized form of an age-old irrigation technique which is still used in the present day in rural areas of the Nile valley.

In other, less fortunate places, water had to be obtained by wells from the subsoil and distributed into the fields, as it was the case in Sana’a, where most wells were connected with mosques. In the Hadramut area, the orchards were located outside the city and not watered by wells, as in Sana’a, but by an irrigation system which regularized, distributed and exploited the floods of the wadi by a sophisticated system of dams, drains and decanting basins. A much more labour-intensive method was the construction of underground channels to tap the subsoil between different geological layers of mountainous areas and drain their water reserve into the city. This method, which required constant maintenance of the underground channels by a long series of vertical shafts drilled into the ground, was widely used on the Iranian plateau and also in the Saharan plains. The irrigation channels were called “qanati” in Iran and “ghettara” in Morocco, and it is believed that at least the Iranian ones are of pre-Islamic origin. Once the water was close to the city, sophisticated distribution systems allocated the right amount of water to individual landowners.
The timeless vernacular architecture of the Islamic world provided the mainstream of built-form, out of which the peaks of monumental architecture could emerge, bearing the imprint of certain historic periods, individual patrons or exceptional master builders. The representative buildings commonly associated with the term “Islamic architecture” are mostly crossbreedings between local vernacular traditions and the products of a more refined court civilization which absorbed, assimilated and propagated inherited building models, often of Roman, Byzantine or Sassanian origin. From the court cities such new typologies could in turn filter down in many variations into the repository of vernacular traditions.

The monumental, or “imperial” architecture of Islam to be addressed in this context, is basically the product of royal and princely patronage. Ibn Khaldun noted that the tribal energies, once emerged from the desert and having attained their urban accomplishment, necessarily led to the establishment of royal authority and dynastic rule, with the corollary needs for corresponding cultural and architectural statements. Very early in the history of Islam, the traditional caliphate, which combined spiritual and political authority, was de facto substituted with the more secular rule of sultans and emirs, who tended to usurp the positions and titles of the early caliphs without really disposing of their religious legitimation. The ensuing divorce of spiritual leadership from political power was a recurrent subject of grief in Muslim history, but was unavoidable. Spiritual matters now tended to fall into the realm of the ulema and the Sufi brotherhoods, which both dealt with the religious concerns of the Muslim community – the former in a more dogmatic, “exterior” manner, the latter in a more contemplative, “interior” sense. Meanwhile, the newly established royal dynasties, such as the Umayyads and the Abbasids, were keen to patronize the arts as a physical expression of their newly established political power. The idea of confirming their status and gaining in legitimation by sponsoring great works of architecture was certainly not alien to them.

The rising Islamic empire, which grew in the vacuum left by the declining rival dominions of the Byzantines and Sassanians, was to become a logical heir to the sunken Roman Empire, at least in the Middle Eastern and North African provinces. The first Muslim patrons could hardly avoid continuing this imperial tradition if they wanted to enhance their royal image. It was therefore natural that they harnessed the economic and artistic potential of the area to produce great works of architecture; it was equally inevitable that late Roman, Byzantine and Iranian building traditions were to become the point of departure for the evolving monumental architecture of Islam for the simple reason that the existing resources of local artists and craftsmen had a major role to play in the process.
The earliest buildings of the new Islamic empire therefore indicate a somewhat eclectic approach, adopting available typologies, construction techniques and modes of ornamentation to meet the emerging new architectural needs. The models which were to exert a direct or indirect influence on the development of Islamic architecture were mainly the "apadana" (the monumental pillared reception hall used by the Persian kings), the Roman basilica, the Sassanian iwan scheme, prominently represented by the palace of Ctesiphon, and the Byzantine dome structures, such as the church of the cloister at St. Simeon in northern Syria. The impact of these models was not always immediate and not necessarily comprehensive, as the borrowing of specific prototypes could result in important transformations and variations of the original scheme according to the changed context and patterns of use.

Although it is not the purpose of this book to discuss the history of monumental Islamic architecture in its formative period, it may be apposite to quote a few significant examples illustrating the adaptation process which took place during the first centuries of Islam. A widespread and rather simple case of absorbing the monumental heritage was the re-use of Roman columns for enhancing the primitive pillared halls of the early mosques in Mesopotamia, originally built with palm trunks. This method was often continued for the construction of new mosques, using the columns as convenient supports for formally designed arcades. An interesting evidence of the early use of the "apadana" scheme is provided by the surviving mosque in Shibam (northern Yemen) from the 8th century AD, which features slender timber columns and an elaborate timber ceiling. The adoption of the Basilica scheme in the Umayyad mosque in Damascus has already been mentioned and will be discussed in greater detail in Chapter 5. It is interesting to note that the Byzantine-style mosaics in the arcade of the mosque show only ideal landscapes, dispensing with the representation of human beings - a first
indication of the emerging Islamic preference for non-figurative artistic expression. The Sassanian iwan scheme had a strong and direct impact on palace architecture as soon as the centre of the Islamic empire moved to Baghdad during the Abbasid period, and later it was to influence the mosque typology in certain regions, as well as domestic architecture. The Byzantine cupola appeared in the first monumental building of Islam, the Dome of the Rock in Jerusalem, built in 692 AD by the Umayyad caliph Abdel-Malik with clear political intentions. However, its influence was hardly felt in early mosque architecture, but rather in the later typologies of funerary monuments and mausolea. The dome of the Hagia Sophia was “discovered” by the Ottomans in the 15th century AD after their conquest of Constantinople, but had no major influence on Turkish mosque architecture until the arrival of the architect Sinan in the 16th century.

In terms of construction techniques, there were two important sources on which the Islamic empire could draw: the age-old Mesopotamian tradition of building with sun-dried or burned clay bricks and the stonemasonry of northern Syria and Armenia. Both were further developed under Islam and coexisted or alternated according to regional preferences. In Egypt, during the 11th/12th century AD, a decisive shift from brickwork to stone took place under Syrian influence, while Mesopotamia and Iran continued to adhere to brick architecture. The choice of building materials was closely related to corresponding ornamentation techniques, since the Middle East had become the repository of a number of decorative wall cladding or facing methods: glazed tiles had been known for ages in Mesopotamia; the Roman and Byzantine mosaic was still widely used in the 7th/8th century; elaborate carved plaster facings had been developed in the Syrian provinces after the late Roman period, and Coptic Egypt excelled in highly decorative limestone carvings, which gave an almost textile character to the ornamented walls, combining stylized figural motives with geometric patterns and the late-Roman wine leaf scroll. Thus local artists in the Islamic provinces were provided with a wealth of resources, of which the emerging Islamic art took full advantage, moulding them together and adapting them to create a new language of their own.

The main internal shaping factor in this gradual assimilation process, which led to the development of an unmistakably Islamic architecture, was the attitudes and the distinct socio-religious practices of the Muslim society, as they placed the adopted formal elements in a new functional and semiotic context, and thus gave them a new meaning. The previously described ritual and spatial patterns of Islam had a great importance in this metamorphosis, especially as they were instrumental in redefining architectural typologies and in establishing a new urban framework, into which individual
buildings were integrated. Last but not least, it was the concept of Islamic ornamental art, as developed and promoted from the 9th/10th century AD onwards, which helped integrate and unify the adopted architectural elements by infusing it with a specific Islamic character.

In the following chapters, we shall discuss the specific building typologies encountered in the urban architecture of Arab-Islamic cultures, as well as the way in which the various components of urban form merged into larger integrated units. The analysis of the various building types will put emphasis on the traditional patterns of use and the corresponding architectural implications in order to throw light on the cultural meaning of the architectural forms described. Readers interested in additional historical and architectural details will welcome the bibliography at the end of this book for further study.
Components of Urban Form I: The Residential Unit

Private houses and clusters of houses are the determining component of the urban fabric in Muslim cities, not only because of their sheer quantitative dominance but also because of the particular attitude of Islam towards formal civic institutions and its relatively low emphasis on monumental public buildings. It therefore seems appropriate to start the discussion of the traditional Islamic city structure with an analysis of the residential unit, in spite of the fact that it is probably the most complex of all elements of urban form. Being strongly rooted in an age-old vernacular tradition, the domestic architecture of Islam shows a great range of local and regional varieties which, from a stylistic point of view, may appear to be quite different from each other. Before discussing specific regional styles, we shall therefore first address the common conceptual and functional issues, which will make it easier to grasp the shared values transpiring through the variety of architectural forms.

The philosophy of housing in the Islamic world may be illustrated by analyzing the content of the three Arab terms “iskan”, “harim” and “dar”. The word iskan, derived from the root s-kan, means dwelling and housing. Its etymological connotations evoke the ideal of a peaceful environment protected from inappropriate intrusions. The general meaning of the word harim has already been dealt with in Chapter 2. In the context of housing it emphasizes the inviolability of the private domain: the interior of the house is identified with the sacred family sphere, the hearth and the clan’s faculty of progeniture; the term harim thus also came to signify the female group of the family living in the house, as well as the corresponding physical and spatial realm within the house. As the woman represents this sacred aspect of the house, she was traditionally encouraged to veil herself when leaving the protective shell of the house and entering the public realm of the city – a basically male domain. The strong identity perceived between the architectural receptacle and its social content is clearly expressed by the words “dar” and “bait”, which mean “house” both in the sense of the physical premises and of the social unit or family clan. Interestingly, the word dar is applied in various dimensions which can transcend the scale of the house. Its etymological root has to do with the idea of encircling, and dar therefore means the encompassed area or community – any space or social unit...
which is centred in itself. Dar al-Islam, for instance, refers to the Muslim family at large, in the sense of the whole religious community of the “umma” and the geographic sphere it occupies. Speaking of “both houses” implies an allusion to both worlds, i.e. the terrestrial and the eternal realm. In the urban context, dar means the well defined private territory of the family or the clan and the corresponding architectural shell which is identified with the inviolable “body” of the family group.

Age-old magic practices, some probably of pre-Islamic origin, testify that this identification is understood in actual physical, and not just symbolic terms: the protected territory will be defended, if needed by force, against illicit intrusion by strangers; possible areas of interface, such as all transition points between the “inside” and the “outside” world, are treated with special care, in order to protect the “aura” of the house, as it were, and to avoid mixing with alien influences. Many hidden or overt rites regarding the protection of the entry gate and its threshold confirm this concern with potentially dangerous interferences. Architecturally, this concern is reflected in the special care with which necessary openings in the architectural skin of the house are treated. Windows are often “veiled” by lacelike wooden latticework (“mushrabiya”), or dissimulated by the ornamental patterns of the wall surface. Doors often have smaller door leaves incorporated into the big gate, so as to minimize the aperture wherever possible. Entry vestibules are positioned in such a way as to obstruct the view of the inner realm of the home.

Islamic legal practice was particularly strict concerning the risk of strangers looking from the street or from adjacent buildings into the interior of
private houses. Any visual intrusion into the family sphere had to be excluded, much in the same way as acoustic and environmental nuisances from nearby commercial and industrial premises. It was the task of the muhtasib and the kadi to handle problems of such nature, preventing them if possible or settling them in a rather pragmatic manner. The surviving manuals of "hisba" from the 11th and 13th centuries AD give us a vivid insight into the practice and methods of urban arbitration. In general, however, the Islamic code of good behaviour, as shaped by the Qur'an and the "sunna" of the Prophet, did everything to avoid infringement on privacy. Any type of spying was banned as strictly illicit, and specific rituals were devised to ease the problem of entering private homes. Thus, the Qur'an explicitly exhorts the believer to observe certain precautions when asking to be admitted into and entering a private home (Qur'an 24/27-28). In practice, this meant that the male non-family members had to wait outside the gate until they were conducted inside by male family members, while women and children had almost unrestricted access to the female territory of private residences. Women had a quite different perception of the residential areas of the city, as the secluded individual houses were totally permeable to them. They were also the privileged users of the often contiguous roof terraces, which offered a wide platform of female space on top of the city.

The social unit of the traditional Muslim house was usually an extended family covering several generations, which itself was part of a larger clan or tribal unit. The agnate family clan was marked by a dominant male ancestry and by the patriarchal character of its social structure, at least as far as the representation towards the outside was concerned. Seen from within, the house was dominated by the female society, with the mother or grandmother as the leading personality. When the grown-up sons married, the qayr often had to undergo a cellular division in order to accommodate a new individual unit within its enclosure. One room or a group of rooms was then arranged as a "house within the house", an additional storey was added, new units were attached to the main house, or existing neighbouring houses were connected to the main house. Such architectural transformation processes linked to the social evolution of the family group are characteristic of most Muslim cities. They often involved changes in the access system by turning semi-public street sections into private corridors or by building on the airspace above the street – a practice which was tolerated by Islamic law if agreed to by the neighbours.

The alliance between two dars posed subtle ritual problems with respect to the adoption or neutralization of an alien "family spirit" introduced together with the bride. For in accordance with the agnatic system, it was always the bride who had to move into the house of the groom. If there was
no consanguinity between bride and groom, special precautions had to be
taken for the transfer of the bride from one home to the other, which
explains the importance of elaborate marriage rites and ceremonies in Mus-
lim countries. The problem could be minimized in cases where the young
man and the girl were cousins, a solution which was widely favoured in
Muslim societies.

The concern of Islam with preserving the integrity of each dwelling unit
could have led to an excessive isolation of individual buildings, had it not
been balanced by other social factors. But it was complemented by the
equally important emphasis on being a good neighbour, as expressed by
the Qur’an and in the sayings of the Prophet. Neighbours, whether related
or not, were exhorted to avoid mutual harm and to actively support each
other in case of need (Qur’an 4/40). There is also a hadith by the Prophet
saying that nobody who has lived in affluence while his neighbour remained
hungry will enter paradise. Other hadiths request all neighbours to grant
each other mutual right of pre-emption on their estates, to observe equitable
distribution of water resources and to allow each other to fix a beam in the
outer wall of the neighbour’s house. This latter recommendation was indeed
instrumental in building houses wall to wall on one or several sides – a fun-
damental prerequisite for establishing the characteristic urban fabric of
Muslim cities, and quite in tune with the saying of the Propheet that believers
“should stick together like the bricks of a wall”. Good neighbourly relations
thus became a specific form of solidarity, shaping the social and physical
fabric of residential districts in Muslim cities. The social cohesion was

54 Roof terrace of a house in Fez, showing the integrity of the protected
domestic space, the shared walls and the opening of the central courtyard.

55 Courtyard corner in a house in Fez, turned into an improvised dining-room
with the help of a transportable copper tray and mobile mattresses.

56 Simple kitchen in a house in Soakin (after J. P. Greenlaw).
favoured by a natural symbiosis between richer and poorer families which was of advantage to both sides. Important families often had a circle of "clients" who benefited from their influence and could in turn provide important services. This informal adoption could almost equal conventional ethnic bonds and was an efficient means of social integration.

The closely interlocked pattern of Muslim neighbourhoods also relates to the fact that ostentatious display of wealth and power was branded as arrogance by the social code of Islam. Wealth was certainly regarded as a distinction bestowed on an individual, but also as something lent to him by the Lord; it was therefore not automatically identified with personal merit and had to be used in a socially acceptable form. Spending funds on artistic decoration of the house was definitely not illicit, and the search for beauty was inherent to Islam, as evidenced by the Prophet's saying: "God is beauty and loves beauty". Yet the architectural richness was mostly displayed within the walls as an element enhancing the idea of the sacred interior space of the home. Exteriorizing it was considered inappropriate or simply bad taste. Accordingly, the urge to expose and enhance the storefront of the house and to link it with considerations of social status and prestige was almost absent in the townscape of Muslim cities, quite in contrast with most European towns. This in turn facilitated the agglutination of individual houses to integrated urban entities.

The interior disposition of the Muslim house was usually based on a number of major cellular units which were grouped around a central distribution space or a courtyard. Each one of these sub-units tended to have an individual access and to be complete in itself, since it was complemented by ancillary rooms for storage and services adjacent to it. The cellular system inside the house was a reflection of the need to subdivide larger family groups into several smaller and virtually independent units. In fact the word "bait", which is often used for such autonomous rooms, can also designate a house, and therefore confirms the concept of "houses within the house" from a linguistic point of view. This type of subdivision was facilitated by the fact that single rooms could be used for many different purposes, as Muslim domestic life did not distinguish between living rooms, bedrooms and dining rooms.

The polyvalent use of space in the Muslim house recalls the underlying nomadic simplicity and implies a minimum of permanent furniture. Closets and cupboards were mostly integrated into wall niches. Mattresses could either be folded and stored away or remained on low benches along the walls, serving both sitting and sleeping purposes. Tables were usually designed as shallow copper trays which could easily be removed or replaced by a simple cloth spread out on the floor. Cushions made up for
chairs, which were virtually unknown in the Muslim household. The dominant posture, at home as in the mosque, consisted in sitting or kneeling on the floor, which of course explains the ubiquitous use of carpets and the consistent concern with ritual purity. The living room, devoid of heavy furniture, could in fact always serve as an improvised prayer area for the family and for guests, and therefore the custom was to take off one’s shoes outside the room, similar to the practice in the mosque.

The relative independence of the individual sub-units of the house, as well as their multi-functional use, was a prerequisite for shifting domestic functions from one place to another – a need which could occur in various ways and for various reasons. A major, and to some extent permanent shift in the use of rooms could be caused by changes within the family structure, due to the marriage of one or several sons, to the death of the father, or to the takeover of the house by one of the sons. But there were also possible short-term shifts of a seasonal nature, depending on climatic conditions: in many Islamic countries, the use of the house was different during summer and winter, with a predominant occupation of the lower floor (or even the basement) during the hot summer period and preference given to the sunnier upper rooms during the winter months. In other instances, the roof terraces were used for open-air sleeping during hot summer nights. Another, almost daily shift of functions occurred as soon as the family group was confronted with non-related male visitors. In this case the normal use of the house had to be suspended and the rooms were polarized into “male spaces”, which would allow for temporary access and reception of outside

57 View of a male reception room of a rich 18th-century mansion in Cairo, seen from the upper floor balcony, which was reserved for ladies.

58 Narrow section of the ladies’ gallery, with mushrabiya shutters looking down into the male reception room.
visitors, and "female spaces", where family life could retreat and continue in parallel without being seen or disturbed by external visitors.

In more modest houses this internal division into "public" and "private" spheres, or "selamlık" and "haramlık", was usually done ad hoc by assigning one of the main rooms, preferably one near the main entry or close to an independent staircase, for temporary reception purposes whenever the occasion arose. In important mansions, reception took on a more formal character and therefore required the establishment of an exclusive and permanent place for this purpose. The result was the creation of special reception rooms occupying a considerable part of the house. In some cases, they extended through several floors, surrounded by family rooms on the upper levels, which allowed the women of the house to glimpse through special windows into the "public" enclave of their home without being seen. In a way, such reception rooms resembled covered public squares transposed into the house and reserved for friends, guests and clients of the influential house owner. Depending on the social status of the family, these rooms could take palatial proportions and become a place for displaying rich ornamental features, commensurate with the wealth of the owner. Their architectural vocabulary often reproduced prestigious elements taken from the typology of royal palaces, such as domes, iwans and loggias.

In spite of its semi-public character, the domestic reception room was always perfectly integrated into the envelope of the house, for the functional differentiation did not take place by segregating the respective architectural volumes, but by accommodating the internal circulation network in such ways as to achieve the desired levels of accessibility. Each major component of the house had its own centrality and needed to be linked with, as well as separated from the remaining parts of the building and the main entrance. This implied a rather complex system of interior corridors, thresholds, doors and buffer spaces within the house. In the case of normal family use, the internal circulation network was totally permeable, whereas with the arrival of external male visitors the various sluices, barriers and sub-divisions were put into use. As a result, there are clear similarities between the internal circulation structure of the house and that of the residential cluster: the position of a reception room with regard to the surrounding house corresponds to the relation between the house as a whole and the encompassing residential structures. The internal corridor of the house replicates, as it were, the function of the alleyways within the residential district. Similar structural principles were thus reflected at different hierarchic levels, which set the ground for the extraordinary structural unity of the overall built form.

Within the urban system, the physical coherence between the various components was based on the graded articulation of a chain of polarities.
between included and excluded spaces, that is, between “inside” and “outside”, or “private” and “public”. The courtyard of a house, for instance, was outside with regard to the rooms around it, but inside with regard to the house. The residential alley was outside with respect to the house, but inside with respect to the residential quarter, which was also enclosed by walls and gates. The subtlety lies in the fact that each polarity was overcome by the integration into a larger unit on the next hierarchic plane. Eventually this resulted in the successful merging of individual parts into a larger whole, without any component losing its individual identity.

This particular spatial thinking can be observed in most traditional Muslim cities. But it becomes most evident in those areas and places where the courtyard house was used as the basic unit of the urban fabric. The courtyard house was indeed the favoured typology of most Arab-Islamic cities, whether in North Africa, Syria, Iraq, Iran or in the central part of the Arabian Peninsula. Its enclosed and introverted private space responded ideally to the requirements of the Islamic social order. In addition it offered valuable environmental and climatic advantages: the walled precinct provided protection against desert storms and allowed special climatic conditions to develop at the centre of the house. The hollow container of the courtyard, sunken into the building volumes, produced shade and could act as a temperature regulator by storing the cool air collected during the night. In

59 Extremely narrow house in Fez, with the courtyard transformed into a light well and upper floor rooms bridging the public alleyway.

60 View of a partly covered alleyway in Fez providing shade and a cool microclimate.
some cases, windcatchers were added on the roof to collect cool breezes and drain them into the lower rooms.

While being an age-old architectural prototype of the Middle East, the courtyard house was developed and articulated in different ways in various Muslim regions according to existing local traditions, available construction materials and the given environmental constraints. In the following, we shall attempt to present an overview of the main typologies, limiting ourselves to a number of distinct geographical regions. Due to the limited lifespan of domestic architecture, it is difficult to find houses older than 200–300 years, and therefore most examples used in this documentation stem from the 18th/19th century. Yet it can be safely assumed that the tradition embodied in these houses dates back much further, a fact which can sometimes be proved by archeological evidence, or by cross-reference to conserved palaces of earlier periods which show similar typologies.

The region which features the most consistent and the most formalized courtyard typology of domestic Islamic architecture is certainly North Africa, from Morocco to Tunisia. Historically speaking, the Maghrebi courtyard house, as seen in Fez, Rabat, Marrakesh or Tunis, is an offshoot of the Moorish architecture of Andalusia, and it is no wonder that there should be a close affinity between the palace of the Alhambra (13th/14th century AD) and the surviving North African town houses of the 18th/19th century. The residential quarters of this Andalusian palace have been destroyed, but the “Court of the Myrtles”, the king’s reception hall, clearly incorporates the model of an urban mansion, whereas the “Court of the Lions”, the pleasure garden of the ruler, engulfs two small but exquisite buildings on either side of the central garden, which are miniatures of courtyard houses. While the elaborate muqarnas dome covering the interior courtyard is an exceptional architectural feature, representing the vault of heaven (see page 41), the plan of these two buildings corresponds exactly to the “bait” of much later Maghrebi houses and exemplifies the close interrelation between palatial and domestic architecture which existed in many parts of the Islamic world.

The dominant formal characteristics of the Maghrebi house are the absolute centrality of the courtyard, called “wust ad-dar” (centre of the house), and an ideally symmetrical layout of the main rooms around it. The hollow volume of the courtyard shapes the building, as if it were the imprint of a powerful invisible matrix into a soft mass of clay. The main rooms form a strongly articulated inner belt around the courtyard while ancillary facilities are relegated to the periphery of the building, where they can be aerated by a separate air shaft if needed. The plan of the house therefore shows an interesting architectural dialectic between the mostly irregular contours of the plot and the perfectly geometric incision of the courtyard, which is the deter-

61 Plan of the “Court of the Lions” in the Alhambra of Granada featuring two pavilion-like dwelling units with covered courtyards north and south of the garden courtyard.
mining factor for the development of the built form. The main rooms follow the geometric pattern of the courtyard, while the minor rooms are used as “filling material” to absorb the change of directions and mediate between the chosen geometric framework and the given irregular plot shape.

The strong formal statement of this architecture is not a matter of aesthetics only but reflects (or induces) an existential experience of being centred in space. The shape of the courtyard establishes a strong vertical aspiration by the simple fact that its upper rim constitutes the primary window of the house, orienting the eye and the mind towards the skies. The secondary windows from the rooms to the courtyard are intermediate openings which receive air and light from above. All doors and windows of the main rooms are focused on the hub of the courtyard, which is often marked by a fountain, emphasizing the vertical axis of the building. Symbolically speaking, the symmetrical and totally balanced order of the courtyard can be interpreted as the timeless centre of gravity of the house, while the periphery responds to the given circumstances and pressures of the earthly environment. The timeless quality of the courtyard space is also enhanced by the symbolic dimension of the ornamented walls with their geometrical patterns and occasional Qur’anic calligraphies, which support the concept of the home as the sanctuary of the family.

The size and character of the Maghrebi house obviously vary with the dimension and the proportions of the courtyard. The majority of houses show courtyard walls of six to ten metres length, which allows for the presence of a central fountain and a few fruit trees. However, there are also smaller courtyards which resemble an air shaft and larger ones which convert their central space into large interior gardens (riyadh). In the vertical direction the building usually extends over two or three floors, although exclusive ground floor structures are also found. Each main floor is usually four to five meters high, and occasionally two-metre-high storage rooms are interjected between two main floors. The courtyard elevations of the oldest type of house, going back to Marinid models of the 14th/15th century, follow the traditional peristyle order, either with continuous columns soaring up to the projecting roof or with two layers of columns interrupted by a first floor gallery running around the courtyard. A more recent typology, going back to the 18th/19th century, shows plain elevations without columns or galleries, but retaining the projecting roof. In the case of narrow courtyards, the colonnaded galleries could be replaced by simple balconies connecting opposite rooms. The staircases, mostly more than one, are placed in strategic corners of the building without being exposed to the courtyard.

The main rooms, or “baits”, usually face each other and are accessible from the courtyard or the gallery. As a rule, their main dimension is defined
by the length of the courtyard while the depth, irrespective of the length, rarely exceeds about three metres. This measure may be due to the practical limitation of beam lengths (building materials had to be transported through the narrow lanes of the city), but it may also have to do with the traditional way of using the interior space. In order to receive a large number of persons during festivities, continuous benches were placed along the whole circumference of the room, allowing people to lean on the wall and to face each other, thus producing a sense of centrality within the room. A depth of around three metres provided the right distance to feel comfortable, and the very long space allowed for a convenient subdivision into a central access zone and two lateral sitting bays. The large double-winged portals

62 Plan of two residential clusters in Fez, immediately east of the al-Qairawiyin Mosque, with a variety of self-contained courtyard houses (see also page 144/155).
Axonometric section, ground floor and first floor plans of a double courtyard house in Fez, serving a large family and embracing several semi-independent sub-units. The house is located in a privileged position between three residential clusters, allowing the owners to accede from different dead-end alleys.

1. Main entry
2. Side entries from other lanes
3. Typical living unit (bait)
4. First floor apartment composed of two small baits and its own central light shaft.
5. Separate upper-floor apartment (masriya)
of the “bait” opened towards the centre of the courtyard and had “doors within the doors” in order to allow the inhabitants of the house to adapt the opening to different occasions and climatic conditions.

The building materials used for Maghrebi houses were sun-dried or baked bricks and cedar wood. The floors and the lower part of the walls were covered with tiles, often producing highly decorative patterns, while the upper parts of the walls could be enhanced by ornamental panels of

64 Central courtyard of a Marinid type of house in Fez, with the double doors of four “baits” facing each other across the courtyard. The location of the house is shown in the comprehensive plan on page 150.

65 The interior of a “bait”, with a view through the small door openings into the courtyard of the same house.
carved plaster featuring geometric patterns, arabesques and calligraphy. The elaborate decoration of the interior elevations around the courtyard helped constitute the inner realm of the house as a qualitative space of its own, totally detached from the external world.

The Syrian type of courtyard house, as it can still be seen in the old cities of Aleppo and Damascus, represents another regional tradition, showing architectural features quite different from those of the Maghreb. The oldest surviving houses stem from the 17th, possibly 16th century AD and benefited, at least in Aleppo, from the solid stone construction which increased their resistance to the effects of aging. In fact Northern Syria, including Armenia, is the place from where stone architecture was brought into other Islamic countries such as Egypt as early as the 10th/11th century. During the Ayyubid and Zengid rule (in the late 12th and early 13th centuries AD), Syria was exposed to Seljuk influences and experienced a new cultural impetus, which resulted in the flourishing of the local stone architecture combined with the introduction of Iranian elements, such as the "iwan". The residential buildings of Aleppo have maintained and perpetuated essential elements of this architectural vocabulary well into the 18th/19th century, in spite of the later Ottoman occupation.

In comparison with the Maghrebi house, the Syrian courtyard house has a more complex and less regular structure, especially with regard to the courtyard shape and the interior elevations of the house. Both building types share the tight outer enclosure wall, which creates a total introversion while allowing for lateral attachment of neighbouring houses. Yet the courtyard of Syrian houses is less formal in shape and there is much less concern for symmetry in the frontages facing the open space. In fact, the courtyard here takes the character of a shared family square, providing the intermediate connection between the various components and sub-units of the house which have a higher degree of independence and self-sufficiency. Symmetric layouts are often applied within these components but are not extended to the central courtyard.
66 Longitudinal section through two adjacent houses in Aleppo, cutting through the "iwan" and the "qa'a" of both houses.

67 Exterior view of a "qa'a" with its projecting dome across the courtyard of a 17th-century house in Aleppo.

68 Interior view of a "qa'a" dome.

69 View of the courtyard and the "iwan" of the house below.

70 Axonometric section of a 17th/18th-century house in Aleppo, featuring a typical "qa'a" with three raised interior iwans around the domed central space. The iwan is located opposite the "qa'a", and two staircases lead up to independent small apartments. The location of the house is shown in the comprehensive plan on page 151.
This holds especially true for the "qa’a", the fully developed reception room of richer houses, which constitutes a house within the house by virtue of its autonomous architectural system. The qa’a consists of a high-domed central space of square shape which can be entered from one side, normally through a door from the courtyard. This central piece is usually surrounded by three iwans, two facing each other and one facing the entry door. The front of each iwan is marked by a wide arch, and the roof can either be vaulted (if built in masonry) or flat (if made of wooden support structures). The floor level of the iwans is always raised by one or two steps. The three walls forming the niche of each iwan are mostly solid, which stresses the centripetal orientation of the niches towards the sunken square. This central space, acting as the "courtyard" of the qa’a, is often equipped with an interior fountain and enhanced by a high dome which lets in light and air through the openings of its polygonal or circular drum. The frontage of the qa’a facing the main courtyard contains only minor window openings, emphasizing the dominant vertical orientation and the self-contained character of the central space.

The reception rooms of more modest houses could not reproduce in full the scheme of such palatial structures but often adapted the qa’a in fragmentary form, with only one bay and a small anteroom, directly accessible from the main courtyard. The single iwan of these simplified qa’as was also raised by one or two steps with respect to the entry zone close to the door. This subtle vertical differentiation between lower circulation space (where one would take off one’s shoes) and higher living and sitting areas became so ubiquitous that it was adopted for almost every room, even if the sunken entry space behind the door was sometimes reduced to less than a square metre. The resulting steps formed a threshold which was called “atabe”, meaning retardation, at the entrance of the main room.

In addition to the qa’a, there was often an open iwan directly attached to the courtyard, which could serve as a family sitting area or potential open-air reception space. It was usually oriented northwards to avoid direct sun radiation and to catch the cool breeze during hot summer days. It could also be flanked by two small lateral rooms which were accessible via the iwan and formed another sub-unit of the house. Separate individual living rooms could be accommodated on any side of the courtyard, including intermediate sections between the six- to eight-metre-high structures of the qa’a and the open iwan. Some of these independent dwelling units were called “murabbā”, or “square”, and could provide separate quarters for family members or guests. They could be located either at ground level, directly accessible from the courtyard, or at first-floor level, and were often serviced by individual open stairs.
The Egyptian courtyard house has a complex history, since Egypt has been a melting pot of various cultural influences during the Islamic period. Through the centuries, it was subject to frequent dynastic and cultural changes which were also reflected in its domestic architecture. The excavations of Fustat (covering the period of the 8th and 9th centuries AD) inform us of the existence of courtyard houses with regular central squares, relatively symmetric introverted rooms and T-shaped reception rooms with central iwans — a typology which was possibly introduced by the Tulunid dynasty and would therefore reflect Persian influences, as filtered through Abbasiid court architecture. Accounts written by travellers in the 11th century tell us about the high tower houses in the popular districts of Misr (an extension of Fatimid Cairo), of which no physical or archeological evidence has remained. The typology of surviving Cairene houses from the 16th to the 19th century is, however, linked to the model of 14th and 15th century Mamluk palaces which eventually influenced the structure of later private residences, as well as Qur’anic schools and mosques.

Many features of the Mamluk palaces were strongly influenced by Syrian models, but eventually the Cairene qa’a, as developed during the late Mamluk and early Ottoman period, became a distinct typology in its own right. It was characterized by two deep iwans facing each other across a sunken central space (“durqa’a”) which shows the typical features of a covered courtyard. The durqa’a functioned as an entry space which gave access to the raised iwans. It was usually enhanced by highly ornamented floor patterns and a central fountain integrated into the floor. The space above the durqa’a extended vertically across the surrounding volumes of the house, creating a central void which was usually covered by a pyramidal roof on a pierced polygonal drum, allowing light and air to penetrate. The private living rooms in the upper floor, located above the iwans or around the vertical shaft of the durqa’a, often had screened windows overlooking the central space of the qa’a, which permitted the female group of the family to watch activities in the male reception room.

A characteristic feature of the Cairene house, also to be found in the architecture of the Red Sea (in cities such as Jedda and Soakin), is the “porosity” of large portions of the external walls and internal partition walls. In these places the hot and humid climate called for a maximum of cross-ventilation, which in principle conflicted with the need for privacy. The solution was to provide densely screened openings allowing for glimpses into the outside world and, above all, for effective air circulation throughout the house. The timber lattice screens, which eventually came to dominate the outer and inner elevation of domestic buildings, were called “mushrabiya” or “rowshans”. The term mushrabiya is derived from the verb “ishrab” (to

71 Covered central space between two opposite iwans in the 15th-century Qait Bey Madrasa in Cairo.

72 Axonometric section through the qa’a of a late Mamluk house from the 15th/16th century (after B. Maury).
73/74 Cross-section of ground floor and first floor of Bait as-Suheini, a complex private mansion from the 17th/18th century in Cairo, formerly belonging to a sheikh of al-Azhar University.
1 Alleyway
2 Bent entrance with mastaba for doorkeeper
3 Informal covered reception space
4 Formal male reception room (mandara)
5 Private teaching room
6 Kitchen
7 Prayer room
8 Upper floor family rooms
9 Family loggia (maqad)
drink), and in fact the custom was to keep water jars of unburned clay close to the screens, to benefit from the natural cooling effect of the draft. Often, the mushrabiyyas were shaped in such a way as to project into the street or to form protected bay windows with integrated benches. Thus they added attractive niches to the rooms while creating elaborate and intriguing street frontages. In addition to the mushrabiyyas, many Cairene houses were also equipped with wind catchers ("malqaf"), which directed cool breezes from the roof into the lower rooms.

75 View from the first floor loggia (maqad) of Bait as-Suheimi across the courtyard, towards the screens of the main female reception room, which sits above the informal covered reception space.

76 Interior of the main female reception room facing the courtyard.
With the exception of the "rab", a multi-storey apartment whose typology is linked to the housing units of the caravanserai, the traditional layout of Cairene houses was organized around a central courtyard. Similarly to the Syrian houses, there was no emphasis on the symmetrical interior elevation of the courtyard, since the use of more formalized layouts was confined to the interior of the reception rooms. Within the qa’a, there was a greater degree of transparency, since the rooms could have mushrabiya openings to both sides, i.e. to the courtyard and to the street, whenever a street front was available. The qa’a was the basic architectural scheme used for the large male reception rooms ("mandara") on the ground floor and could take monumental proportions, with the central part extending through three floors and being separated by mushrabiyas from the surrounding family rooms. However, the qa’a could also be repeated on a smaller scale on the upper floors as the nucleus of the family rooms and the female apartments, to the point where many rich houses in fact became aggregations of a number of qa’as, interconnected by corridors, staircases, service rooms and open terraces. Within this sequence of upper-floor rooms there was often a "maqad", a covered loggia that overlooked the courtyard and was predominantly used by women. As in most Arabic-Islamic houses, access from the street into the courtyard consisted of a bent corridor connected with a small anteroom and a bench ("mastaba") for the doorkeeper.

The Iraqi type of courtyard houses shows a greater concern for a regular layout of the courtyard, without necessarily insisting on bi-axial symmetries. None of the existing historic houses in Baghdad is older than 100–150 years, due to the termite plague which, together with periodic inundations by the Tigris, affected traditional building structures with their predominant building materials of brick and timber. However, the surviving samples of residential architecture clearly show very old Iranian influences, especially with regard to the elevated colonnade ("tarma") and the recessed bay with two front columns, called "talar". Both elements are well known from Iranian palaces and pavilions of the Safavid period and can be traced back to Achaemenid times. In the domestic architecture of Iraq, the tarma is used predominantly on the first floor of the house, providing a colonnade running around one or several sides of the courtyard, often combined with the iwan-like recesses of the talar, and giving access to lateral bays and closed reception rooms ("ursi").

In many houses the first upper floor performed the function of a "piano nobile" with the tarma linking the main rooms of the house, while the ground floor contained only service rooms, and occasionally a shaded recess which was used for open-air sitting and informal reception at the courtyard level. Large parts of the ground floor were sometimes occupied

77 Typical view of Iraqi courtyard house with first floor "tarma" (after O. Reuther).
78 Section of medium-size Baghdad house from the 19th century, showing typical elements:
1 Tarma
2 Ursi (elevation)
3 Kabishkan
4 Nim
5 Courtyard
79 Diagram showing basic "tarma" dispositions within the Iraqi house (after J. Warren, I. Fethi).
by the void of high living rooms located at basement level ("nim"), which were mainly used during the hot summer period. As the representative upper floor was easily five metres high, it allowed the inclusion of split levels in the corners, for instance on both sides of an ursi or a talar. This produced low mezzanine rooms ("kabishkan") to which the women could retire if the main floor was used for a male reception. The kabishkans had strategically located windows through which the women could look into the ursi or the tarma just beneath them and also watch the lower courtyard level across the open colonnade. Whenever first floor rooms had a front to the street, they tended to project into the air space of the street. In such cases, the cantilever was often irregular with respect to the ground floor walls, as the regular courtyard shape reflected by the projecting rooms was not always parallel with the irregular contour of the plot. The resulting triangular corbels produced the typical dented street elevations.

While the examples of urban courtyard houses described above are not exhaustive, it must be acknowledged that there are regions which have adopted different typologies. Most notable among these are Anatolia and parts of the Arabian peninsula, including cities such as Jedda, Mecca and Sana'a. Although the courtyard element may be absent in these buildings, the spirit in which the main components of the house were laid out and used remains closely related to the basic ideas put forward in the introductory paragraphs. Covered halls often made up for the missing courtyard, and centrality played a major role in the layout and interior decoration of the main reception rooms.

The structure of the Anatolian house is again based on the relative autonomy and the polyvalent use of the house’s major components. The layout of the main rooms is handled in such a way as to ensure their mutual independence, while they can be easily aggregated into complex larger houses. In more rural conditions, where enough land was available, the house formed a pavilion-like structure within an enclosed plot. Often the back of the building was connected to the enclosure, while the front side faced an enclosed garden space. The front rooms, orientated towards the garden, were preceded and connected by a covered hall ("hayat") which was often raised above the ground floor, not unsimilar to the colonnaded tarma of the Iraqi houses. Since the outer enclosure with its main gate protected its intimacy, the hayat was accessible by an open staircase from the garden. In larger and more complex houses, this entrance hall was pulled into the centre of the building and symmetrically surrounded by a series of living rooms ("oda"). This central hall ("sofa") then performed the function of the courtyard but, being covered, it had obvious advantages in the

80 Axonometric section showing strategic position and views from the ladies' "kabishkan" on the mezzanine of the upper floor.
climatic context of Anatolia. In some cases, the sofa was enlarged into a cross-shaped core structure, with four lateral bays reaching out to the periphery of the building, while the four main rooms were geometrically located at the corners of the building, which produced an extremely formal layout. In some respects, the bays could be compared with iwans, although the lighting through the extroverted windows gave them a different character. Usually they performed the traditional function of informal sitting niches

81 Engraving from the 19th century showing the special typology of houses on the riverfront, with a “tarma” overlooking the Tigris.

82 Residential alleyway in the old city of Baghdad, with the typical projections of upper-floor rooms into the street.
inter-connected by a common central space. The inclined roof of Anatolian houses contrasts with the roof terraces of North African and most other Middle Eastern houses. The need for protection against the cold and heavy rainfalls precluded the possibility of vertical openings.

The *South Arabian tower house* has a long historical tradition going back to pre-Islamic times. It was conceived as a stronghold to protect a family, its livestock and its agricultural products. The house could be built from clay or sun-dried clay bricks, but also partly or fully from stone, depending on the local materials available. Obviously, the prototypes of this typology were of rural character and conceived as free-standing towers. In Yemen, one still comes across such examples with massive round tower shafts supporting rectangular dwelling units. In the context of villages and cities, however, the towers needed to be attached on one or two sides, forming contiguous rows or clusters of buildings.

83-85 Elevation, section and plan of an 18th-century house in Bursa (after S. H. Eldem).

86 Top-floor male reception room (mafraj) in a tower house in San'a.

87 Highly decorated elevation of an 18th-century tower house in San'a, showing the old type of fenestration, with small circular alabaster discs.
The example of Yemen shows how the rural economy could be perpetuated under urban conditions, even in large cities such as Sana'a, and how this conditioned both the environment and the construction techniques: in the city of Sana'a, for instance, the sunken orchards interspersed among the urban fabric were in fact the quarries from which the clay needed for the construction of the surrounding houses was extracted. In exchange, their soil was fertilized with the carefully collected human and organic waste from the
surrounding households. Both the rural and the urban tower house were characterized by a functional vertical division. The lower floors were used for animals and for the storage of merchandise or agricultural products, while the upper floors were reserved for residential purposes. On the residential floors, the individual rooms were usually held together by a central hall which functioned as a covered courtyard and excluded direct access or visual intrusion from the staircase into the rooms. The staircase itself was separated from the hall by a door, which emphasized the independent “apartment” character of each floor and allowed for easy division between male and female social activities. It thus became a sort of “vertical access corridor”, entered by the main gate of the house, which was followed by a vestibule. Often an enclosed forecourt in front of the main gate was provided as a buffer between the house and the street.

In contrast to other types of Muslim houses, the male reception space could also be located at the top of the house. The relatively recent habit of building a pavilion-like “mujārij” on the roof, with windows offering generous views of the city skyline, has in effect marked the townscape of Sana’a. The mujārij has become the preferred place for the men’s social ceremonies, including the popular qat sessions in the late afternoon and evening. Beneath the recessed mujārij, most houses had protected roof terraces, enclosed by 2-metre high brick walls. These made up for the lack of an open courtyard and could be used by the women for all sorts of domestic activities.

With its outward looking rooms, window openings became a critical issue for the tower house, especially with regard to the Muslim ethics of pri-
vacy. While the tower houses of Jedda and Mecca adopted the “roshan” system to protect the interior by wooden lattice screens, the traditional Yemeni mountain house, which was not exposed to the hot and humid climate, shows a different approach: openings were reduced to a minimum (except on the mafraj) and often camouflaged by an ornamental web which covered the body of the house. The oldest surviving houses of Sana’a, presumably from the 18th/19th century, show an ingenious fenestration system which allowed for a minimum permanent lighting, combined with possibilities of individual daylight regulation. The flexible element in this system was a small window with double shutters just above floor level, so that people sitting on the floor could look out by opening the main shutters or by manipulating a minuscule hatch built into the shutter. About two to three metres above, there was a fixed light source consisting of two circular eyes filled with an alabaster disc which excluded any visual intrusion, while permitting the sun to penetrate and maintain a dim daylight in the room, even with closed window shutters. In more recent times, the openings tended to become larger, and the “oculi” were replaced by semi-circular frames containing two layers of stained glass mosaic which fulfill the same purpose. The plastered ornamental grid into which the openings were integrated helped dissimulate the windows through a highly decorative pattern which was periodically renewed – not unlike a ritual tattooing intended to protect the female body of the house.
Components of Urban Form II: The Mosque and Related Welfare Buildings

The Arab word “masjid”, the basic term for the mosque, literally means the place of prostration, where the community worships the Lord and performs the prescribed prayer rituals. As already stated, the mosque building is not sacred in itself, nor does it contain sacred objects of liturgical importance. Its distinction is established by the state of ritual purity which the believers observe within its walls and by the orientation of the prayer space towards the Ka’aba of Mecca. The essential architectural requirements are therefore a clear demarcation, or an enclosure, and a front line perpendicular to the qibla direction, behind which the believers can stand in rows facing Mecca in order to communicate with the spiritual centre of Islam across time and space. The ritual purity of the prayer space is secured through mandatory ablutions of the users of the mosque, and must be maintained throughout the day, regardless of other activities occurring in the mosque between the five daily prayers. The prayer sequence was scheduled by the Prophet at fixed intervals, i.e. before sunrise, at noon, in the middle of the afternoon, at sunset, and an hour and a half after sunset.

In Islam, prayer can take place either individually or as a collective ceremony, involving small or large numbers of people according to circumstances. However, joint prayer is encouraged and is mandatory for men at Friday noon, when it coincides with a civic assembly of the community. On this occasion, the inhabitants of a township or a region are addressed by their political leader, his representative or another trusted member of the community who acts as their “imam”, i.e. the leader of the collective prayers. The mosques where this civic congregation takes place are designated as “Friday Mosques” and usually offer not only the largest prayer halls but also rely on historical tradition established by their founders. In addition, they often serve as centres of a Qur’anic university.

Whether performed individually or collectively, prayer always involves a ritually defined sequence of bodily movements, based on a model established by the Prophet. The movements start with a standing invocation of the Lord followed by repeated recitations from the Qur’an, interspersed with a series of bows and prostrations which culminate in touching the floor with the forehead. Kneeling on the floor is the recurrent intermediate position between the prostrations and concludes the sequence of prayer movements. It

90 Street front of the 19th-century Sultan Hassan Mosque and madrasa, as seen by D. Roberts in the 19th century. The level of the mosque is raised to allow for ground floor shops, the income of which paid for the maintenance of the mosque.
leads naturally to the more relaxed sitting posture which follows the prayer itself and which is also used for meditation, for individual or collective remembrance of God ("dhikr"), for teaching and learning in the mosque, or simply for social gatherings. This type of sitting or squatting on the floor is a ubiquitous habit in Muslim societies, whether in the tent, in the mosque or in private living rooms, whether eating or chatting inside a shop. Therefore, it illustrates strikingly the smooth transition between prayer and daily life which characterizes Islamic customs.

For individual prayer, a small mat or carpet is often folded out to provide a clean prayer space and to indicate the qibla direction. In the case of community prayer, be it within the mosque or in large open spaces outside the city (for instance on the occasion of the Eid festivities), the believers align shoulder to shoulder in long rows following each other at a distance of less than one metre, so as to allow the collective performance of prayer movements. The rows of people facing Mecca are parallel to the "qibla wall" in the front of the place of prayer, which defines the orientation of the assembled believers. According to traditional customs, each row first tends to extend laterally to the full width of the available space before a new row is added behind.

The qibla wall thus is the primary architectural element of the mosque, defining the position and the proportions of the prayer hall which, at least in the early times, tended to opt for width rather than for depth in its layout. The other significant architectural elements of the mosque which complement the qibla wall are: first, the "mihrab", a niche in the centre of the qibla wall pointing towards the Ka'aba, second, the "minbar", a raised seat with a few steps leading up for the imam, from which he can address the community at the Friday noon ceremony and, third, the minaret, a tower from the top of which the prayer call can be pronounced by the muezzin. The development of these basic functional and architectural features of the mosque was marked by two major prototypes, the first one being the house of the Prophet in Medina and the second being the Umayyad Mosque of Damascus, to which we shall refer in the following paragraphs.

The large courtyard of the Prophet's house was the first congregation space of the early Muslim community. On the east side it contained the private apartments of the Prophet, while the north and the south sides of the enclosures showed simple portico structures built of palm trunks. The northern portico served as a shaded prayer place when the qibla was still oriented toward Jerusalem, while the southern one was built after the qibla had been turned towards Mecca. This southern arcade, where the Prophet also used to teach his followers, was enlarged immediately after his death to become the prototypical Muslim prayer hall. The original structure of the
91 Rows of believers sitting on the ground after concluding the community prayer in an open-air precinct (Sudan).

92 Individual prayer in front of the qibla wall of the Umayyad Mosque in Damascus. The picture shows people in various postures of the prayer sequence. Mihrab and minbar are seen on the left side of the picture.
Prophet’s house was completely replaced under the Umayyad caliph Walid II (705–715 AD) and transformed into a memorial building. This first “monumental” mosque structure has not survived in physical terms (except for the tomb of the Prophet), but its features were described by many writers and travellers during the early centuries of Islam. So were the first reactions of contemporary Muslims, some of them regretting that the new mosque was built “in the manner of the churches”, i.e. using Byzantine craftsmanship for the architectural decoration.

Although the Umayyad building is not preserved, a diagrammatic reconstruction has been attempted on the basis of written documents, and we know that the builders were keen to preserve religiously a number of references to the original layout and to the way it was used by the Prophet. The location of the tomb thus corresponds to the room in which the Prophet passed away. The position in front of the qibla wall, from which the Prophet used to lead the prayer, was marked by a niche – the prototype of all future mihrabs. Traditionally, the niche, a recurrent iconographic motive, was used to enhance a memorable object or person by framing it in a dignified manner. In the context of Islam, the void of the mihrab can be seen as symbolizing the presence of the divine, which is not to be grasped in any material sense, except by the reverberation of the Qur’anic verses, as reflected by the semi-circular shape of the niche. Close to the mihrab, the new Medina mosque featured a raised chair, accessible by a few steps, with the intention of reproducing a similar structure to where the Prophet sat teaching before or after prayer. From then onwards, this chair became the exemplary minbar from where every caliph, ruler or imam addressed his community during the Friday ceremony in his capacity as “lieutenant” of the
Prophet. Initially, the Umayyad Mosque of Medina had no minaret, since the prayer call was originally performed by Billal, the black servant of the Prophet, who used to climb onto the roof of his house for this purpose. In later times, a tower was used to increase the acoustic range of the prayer call, and there was no shortage of such prototypes in the Middle East, from the Pharos in Alexandria and the Christian church towers in Syria, to the corner towers of the Roman temple district in Damascus.

This leads us to the second and more monumental archetype of the mosque, which resulted from the adoption of the “Temenos” (the enclosed temple district) of Roman-Hellenistic origin in Damascus. The interesting transformation process of the Roman city centres in Syria into Muslim centres has already been addressed on pages 54 - 57. While the Christians had replaced the temple in the centre of the open space with the Church of St. John, the Umayyad caliph Walid II (also the patron of the renovated Medina mosque) opted for a totally different approach: after reimbursing the Christians he ordered them to remove St. John’s Basilica and to place the hall of the mosque at the southern end of the site. Accordingly, parts of the massive Temenos enclosure were used to form the three outer walls of the new mosque, while the added front elevation giving access to the prayer hall faced the large courtyard, which was surrounded by arcades on the other three sides and thus became the central piece of the site. One can only suppose that the Roman columns employed for the construction of the pillared prayer hall were those taken from the destroyed Church of St. John – a re-use process which was typical for many of the early Islamic mosques in the areas of the former Roman dominion.

The happy coincidence in this transformation process was that the qibla wall of the planned new mosque – Mecca being south – matched the long southern wall of the Temenos enclosure, allowing for the desired maximum width of the new mosque structure. Site conditions and functional requirements thus concurred in creating the typical laterally extending prayer hall, which responded so well to the preference for long parallel rows of worshippers established in the early years of Islam, when monumental architecture had not yet been developed.

Another interesting observation resulting from the analysis of the Umayyad mosque in Damascus concerns the common typological ancestry of the mosque and the early Christian church: both used the model of the Roman basilica, yet in quite a different manner. The Christian liturgy, being based on the procession towards the altar, highlighted the existing main axis and the higher central nave of the basilica and complemented it by the apse, thus transforming a secular structure into a sacred building and enhancing the existing axial emphasis of the basilica by giving it a new reli-
gious meaning. Islam, in turn, was interested in the basilica in terms of a multifunctional pillared hall which would accommodate the rows of believers during prayer times while allowing for all sorts of other uses in between, such as teaching, political assemblies and even socializing or relaxation. As the mihrab contained no altar, the qibla orientation did, in principle, not have to coincide with the main nave of the basilica, although this happened in the case of some early examples, such as the al-Aqṣa Mosque in

96 Interior of the prayer hall, with the mihrab to the far right.

97 Structure of the early Christian basilica, showing its directional central nave.
Jerusalem. But the underlying idea of the qibla direction was different: rather than stressing a dominant central axis, it implied a field of multiple and equivalent parallel vectors, all converging on the distant vanishing point of the Ka‘aba. Therefore, a bundling of spatial energies did not make sense in religious terms, although it occasionally happened for other reasons, such as the need for a royal access in the central line of the mosque. However, if this was to occur, the central aisle tended to be much shorter than the qibla wall, which gave the “Islamic basilica” different proportions and a particular character.

As can be seen in the Umayyad Mosque in Damascus, the main entry axis crosses the central nave of the building and thus creates an unresolved directional ambivalence, due to the fact that the transformation from the basilica into the pillared hall of the mosque is not as yet fully accomplished. Later buildings, such as the Amr Mosque in Cairo or the great mosques of Kairouan or Cordoba, show the progressive Islamization process which led to the typical “forest” of columned or pillared arcades juxtaposed one after the other. This concept links up with the layout of the primitive Arab palm-trunk shades, as used in the Prophet’s house in Medina and in the early mosques of the first Muslim settlers. Even if later centuries employed much more sophisticated building techniques and new types of artistic decoration, prompted by the absorption of late-Roman and Byzantine architecture, the original archetypes have emerged again.

Functionally and architecturally, the mosque of the early Islamic centuries is therefore the result of a two-fold heritage. On the one hand it continues the tradition of the first religious community centre shaped by the Prophet, combined with that of the early inter-tribal assembly and meeting spaces. On the other hand it has, at least in part, absorbed the typology of the Roman basilica and, even more so, the tradition of Greco-Roman public squares, i.e. the Agora and the Forum, in both the political and the social sense. In this respect, it is enlightening to read a passage from the accounts of Ibn Jubayr, an Andalusian traveller who visited Damascus in the 12th century AD and described the evening life in the courtyard of the mosque in such a way that one cannot help but being reminded of a Mediterranean square: “Here people congregate, for it is their place of care-dispelling and recreation, and here every evening you will see them, coming and going from east to west, and others you will see talking to their friends, and some reading. In this manner they will go on, coming and going, until the end of the last evening prayers, and then depart”. His words depict the synthesis of an old civic tradition and a new religious framework, which took place for the first time in this Islamic capital.
As already pointed out, the structure of political institutions in Islam was fundamentally different from that of Greco-Roman antiquity and Renaissance Europe, mainly due to the existence of a religiously defined social and legal order provided by the shari'a. Therefore, the mosque in a way combined the functions of temple, city hall and public meeting place, and these institutions did not develop as separate entities. The mosque was also the seat of the kadi (judge) who acted as the trustee of the Qur'anic law on behalf of the urban community. Together with his assistants (among them the
muhtasib or market surveyor), he was in charge of “advising the good and preventing the evil”. The prayer hall could equally serve as teaching space for the Qur’anic sciences, where the sheikhs would lean against a column surrounded by groups of students sitting on the floor. Its political function was highlighted during the Friday noon assemblies, when the ruler, his representative or a religious leader would head the prayer and address the community. This weekly ceremony involved the implicit (but not less obligatory) confirmation of the social contract between the ruler and the ruled. It implied both the acceptance of the executive authority of the ruler by the community and the adherence to the given religious laws by the ruler.

During the early times and well into the Umayyad period, the mosque was connected with the seat of power. In Kufa, one of the early garrison settlements, the “dar al-imara” (seat of the government) was directly attached to the mosque, and eventually the “bait al-mal” (treasure house), originally part of the dar al-imara, was erected in the courtyard of the mosque to protect it from being plundered. In Damascus, the original palace of the

100 Typology of the early type of pillared hall mosques with arcades and an incorporated courtyard (after Vogt-Göknil).
A. Umayyad Mosque in Damascus (705 AD)
B. Ibn Tulun Mosque in Cairo (876 AD)
C. Umayyad Mosque in Cordoba (785–961 AD)
D. Al-Hakim Mosque in Cairo (991 AD)
Umayyad caliphs, of which no physical evidence has survived, is said to have been built adjacent to the great mosque, with a direct connection to the prayer hall. The same must have applied to the central palace and mosque of the round city of Baghdad, built by the Abbasid caliph al-Mansour (762–775 AD). In such cases, and especially in Damascus, it is likely that the prayer hall also served as an audience and reception hall for the caliph — a function which was in tune with the tradition of the Prophet's house and which was later continued on a more modest scale by the regular justice sessions of the kadi, as held in the Friday mosque of major Muslim cities.

While in the early times the mosque was the exclusive public facility representing the complete range of social and civic affairs in the city, it later experienced a certain reduction of its scope and a greater concentration on social and religious affairs, at the expense of its political functions. This was due to the fact that the ruling dynasties, being involved in military power games and less concerned with religious legitimation, preferred to live in palace cities or citadels detached from the settlements of the local bourgeoisie. A dual system of political leadership was thus established, which did not dissolve the original unity of spiritual and worldly matters cherished by Islam, but brought about a de facto division between state leadership (or military power) and local urban government.

On the level of the urban communities, one can almost speak of a sort of local autonomy, inasmuch as they were governed by the commonly accepted rules of the Shari'ah and customary law, to a point that a simple "monitoring" by the kadi was sufficient. In case of internal conflicts, the ulama, led by the mufti and the kadi, and the sheikhs of the various social groups (whether ethnic groups, religious brotherhoods or trade corporations) were bound to settle them by internal negotiations and, if possible, by consensus. A more critical issue was the potential conflict between the military and the local leadership; in practice it led to a permanent search for balance between often divergent interests and motivations, and in most cases compromises had to be found which required skillful bargaining and a good portion of realism on both sides. From the urban management manual by the Andalusian kadi Ibn Abdun to the "Book of Governance" by the Seljuk wazir Nizam al-Mulk (not to mention numerous "Mirrors for Princes") and from the travel accounts of Ibn Battuta to the stories in Jallaluddin Rumi's "Mathnawi", Islamic sources abound in vivid descriptions of such situations and how they should or could be resolved.

Parallel to the progressive reduction of its political importance over time, the mosque also experienced a certain differentiation of functions, which resulted in the establishment of a number of related building types of com-
bined social and religious character, but of narrower functional scope. The most prominent of these new public welfare buildings was the "madrasa", offering special teaching halls, combined with attached dwelling units for students, similar to a religious college. Its rise in the 11th/12th century AD was due to the desire of the Seljuk dynasty to promote orthodox Sunnism and to train new generations of loyal teachers and civil servants, who would serve not only religious, but also political functions.

The function of the madrasa halls could occasionally overlap with that of the mosque, and in fact the architectural typology of the madrasa was so successful in Syria, Iran and Egypt that it challenged and influenced mosque architecture in these countries during the 12th to the 15th century AD, giving rise to a new mosque typology which started competing with the traditional pillared prayer hall. The dominant architectural features of this typology were the four iwans built into the centre of each courtyard front, thus producing a cruciform arrangement – a lay-out known from Abbasid palaces in Samarra (9th century AD) and going back to Sassanian and Parthian precursors. Although simultaneous teaching in the four orthodox schools of Islam was a rather rare event in most places, the existence of the four schools of law gave a justification to the cruciform madrasa scheme. Its merits are, however, to be sought on aesthetic grounds, as it allowed the

102 19th-century view of the courtyard of the Friday Mosque in Isfahan (11th century AD with later additions and transformations) dominated by two pairs of iwans facing each other across the courtyard (after P. Coste).
Plan and section of the Friday Mosque in Isfahan showing an accretion of prayer halls and annexes around the cruciform iwan scheme of the 11th-14th century.

1. Dome of Nizam ul-Mulq (around 1080 AD)
2. Dome of Tadj ul-Mulq (see page 46)
3. The four main iwans
4. Winter prayer hall (rebuilt in 1448 AD)
architects to indulge in their predilection for centred internal spaces by taking advantage of the four magnificent iwan portals facing each other around the central courtyard. While the cruciform layout of iwans contradicted the continuous flow of space of the traditional pillared prayer hall, it was sometimes inserted to enhance its courtyard. One of the most impressive cases is the Seljuk Friday Mosque in Isfahan, which was built and transformed in several phases starting in the 11th century, and reached its final shape in the 14th century AD.

The most homogeneous and most accomplished example of the cruciform iwan-madrasa is probably the Sultan Hassan Mosque in Cairo (1362 AD). One of its four iwans is orientated towards Mecca and used as the formal prayer hall. However, all four iwans could be used for teaching and individual prayer. The building shows the typical concern for composing a totally balanced and self-contained interior space in the courtyard, while the more flexible student units are used to fill the intermediate spaces between the perfectly regular shape of the courtyard and the irregular outer boundary of the site – a typical design attitude already encountered in a number of residential buildings. Smaller examples of Egyptian madrasas from the later Mamluk period (14th/15th century AD) show a reduction from four to two iwans and a courtyard covered by a dome, which created affinities with the reception room of contemporary private palaces. Some of the early Ottoman mosques of Anatolia (14th/15th century AD) also absorbed the iwan scheme of the madrasa, using only two iwans facing each other in the qibla axis and connected by a central dome.

104 View of the central courtyard of the Sultan Hassan Madrasa in Cairo with the mihrab in the iwan to the left (after David Roberts).
105 Plan of the Sultan Hassan Madrasa (1362 AD) showing the iwans, the tomb of Sultan Hassan south of the iwan with the mihrab, and the student accommodation in the corners between the iwans (see also page 98).
Being a lodging facility combined with a religious purpose, the madrasa served as a model for a number of comparable Welfare buildings, where temporary or permanent accommodation was required. Such is the case with the derwish compound or “khanga” which was used to accommodate and support members of religious brotherhoods or mystic orders (sufis), whether residents or travelling visitors. Often a khanga (or “zawiyah” in the Maghreb) was built in connection with the tomb of a venerated spiritual leader. Similarly to the madrasa, it also consists of a combination of one or several prayer halls and a multitude of cellular dwelling units, arranged around the central courtyard or additional side courtyards. This basic combination also applies to the “maristan” (hospital), which completes this group of social welfare buildings. The large Mamluk maristans of Cairo were also equipped with iwans facing the central courtyard and with a number of dwelling units resembling those of a madrasa. Occasionally they were built in combination with other social welfare structures. An early example of such welfare compounds is the group of buildings erected by the Mamluk sultan Qalawun (1285 AD), including a famous maristan with a central courtyard and two iwans, a madrasa and the tomb of the patron (see page 118).

106 Plan of the Maristan Arghun (12th century) in Aleppo, built around a nucleus formed by a central courtyard and a prayer hall (south of the courtyard). The interior corridor, bending around the prayer hall, gives access to three smaller independent units with their own air shaft, two containing cells for the sick, and one containing washrooms (see also comprehensive plan on page 151).

107 View of a small independent unit with the individual rooms around a tiny courtyard.

108 Section through Sinan’s Shehzade Mosque in Istanbul (16th century), a typical example of the later Ottoman mosques.
Other such examples are the Ottoman “külliyes” in Istanbul which formed complete welfare centres around the main mosque of the ruler and thereby created powerful new nodes of urban life.

Before entering in greater detail into the structure and the economic basis of such welfare compounds, it is necessary to address the third stream of mosque architecture, which complemented the earlier typologies of the pillared wall and the iwan scheme by the variant of the domed prayer hall. The model of this later typology was the Hagia Sophia Church in Constantinople, which must have impressed the Ottoman conquerors of Istanbul. Later, their architects (and foremost the great Sinan) set out to adapt it in accordance with Islamic aesthetics.

The transformation process can be followed by looking at the various mosque buildings of Sinan and his successors in the 16th/17th century AD. It involved the departure from the directional space of the Hagia Sophia (which had itself stretched, so to speak, the earlier Roman models in order to accommodate the Christian liturgy with its procession to the altar), and it resulted in a perfectly balanced interior space based on rotating symmetries. Thus a perfect equilibrium was established between the four sides of the building annihilating all directional trends. The two longitudinally placed conches of the Hagia Sophia were repeated and differentiated in such a way as to achieve a cascade of multiple vaultings around the central prayer hall and establish a seamless transition between the underlying square and the crowning dome structure. The only directional element added to the prayer hall was the enclosed open forecourt in front of the
main entrance and opposite the qibla wall to accommodate the overflow of visitors during religious holidays.

The new typology of the domed prayer hall spread over the whole Ottoman empire between the 16th and the 19th century and was, at least to some extent, identified with its political supremacy. However, outside Turkey, it did not completely overrule earlier typologies, which continued to be applied in their regions of origin. The Maghreb, in particular, remained faithful to the model of the pillared hall, which had been introduced by the Umayyads in Andalusia and has since dominated the so-called “Moorish” mosque architecture up to the present time. Egypt and the Middle East continued to apply the Mamluk versions of the madrasa mosque while Iran, during the Safavid period (16th/17th century AD), experienced another renaissance of the iwan scheme. One of the masterworks of Safavid architecture, the Shah Abbas Mosque, succeeded in synthesizing all three typologies: its main entry and courtyard are marked by monumental iwan structures, while the prayer hall is dominated by a central dome and features two pillared halls as a lateral extension of the central prayer space.

In addition to their combined religious and social orientation, all the social welfare buildings mentioned, including the mosque, had a common economic base: as a rule, their construction and their subsequent maintenance were ensured by a religious endowment established by the ruler, a member of his family or another generous sponsor in favour of the community. This endowment was called “waqf” (plural awqaf), and its possessions and the regular revenues (which, beside the sponsored building, could also include the rents of donated grounds, private houses or commercial facilities) became the inalienable property of the local community. This accumulating body of self-sustaining public properties, administered by the kadi,
was inextricably connected with the economic base of the city and became a fundamental factor for ensuring local autonomy and urban continuity. Yet its durable character, unchangeable by definition, could also generate problems in the case of much later and unforeseen developments.

Clearly, the motives of waqf donations were not always limited to philanthropic intentions, but often reflected the desire of the donor to improve his prospects for the other world, to compensate for previous misdeeds, to be remembered by later generations and to benefit from their prayers, or simply to document his status and prestige. This eventually led to the much-cherished concept of donating memorial welfare complexes including a mausoleum of the sponsor. Although certain purist religious movements in Islam have rejected the idea of funerary monuments because of the inherent danger of idolatry, mausolea became an important category of buildings in Islamic architecture, especially in Egypt during the Ayyubid and Mamluk period and in Iran, Turkey, Central Asia and India under the rule of Turkoman dynasties. The origins of funerary architecture are certainly rooted in religious motives, as is the case with the Prophet’s tomb and with the Shi’ite shrines in Egypt, Syria, Iraq and Iran, or with the Maghrebi zawiyas built around the tombs of holy men. Almost inevitably, this privilege reserved for spiritual leaders was then claimed by powerful political leaders who wanted to link their name to prestigious buildings and works of art – much to the benefit of master builders and craftsmen entrusted with corresponding commissions. Although not a funerary building, the Dome of the Rock in Jerusa-
lem (688 AD), inspired by the Byzantine model of the “martyrion”, was the earliest architectural model for this typology and had a deep influence on Muslim mausoleum buildings. These could be either free-standing or combined with a mosque, a madrasa, a khanqa or even with a large garden (as in Moghul India), to form large social welfare complexes.

An extremely important facility was the public bath, or “hammam”, which together with the mosque and the suqs constituted the triad of essential urban facilities in the Islamic city. Like the mosque, it combined religious and social functions, since it allowed easy accomplishment of the great ablutions while also serving as an alternating meeting place for both male and female society. Some public baths were integrated into the central market system, often close to the main mosques, and were conceived for predominantly male use, while others were integrated in residential districts, offering a very popular entertainment for women and children in the afternoon and allowing for male use in the evening.

113 The endowment compound built by Sultan Qalaun in 1285 AD in Cairo on the site of the former Fatimid palace.
1 Main entry
2 Mausoleum
3 Madrasa
4 Hospital (destroyed)

114 Entry hall of the 13th-century Hammam Nahassin in Aleppo, with a series of raised alcoves around the central space for changing and resting of visitors.
In principle, the hammam adopted and continued the system of the Roman thermae, providing three successive stations: the ante-room (which could be used as a dressing room and for resting, drinking and eating after the bath), an intermediate room, and the hot steam room, which was mostly provided with a water basin or central pool. Usually the steam room was covered by a pierced dome, which could be quite monumental in certain cases and generated the dim and relaxing ambiance of a grotto. The sequence of the three rooms allowed for graded transition between cold and hot, and the intermediate buffer space could also be used for relaxation, washing and massages. In order to ensure the necessary water provision, hammams had to be connected to the urban irrigation system or be posi-
tioned close to a natural source of water. The heating section of the hammam was often combined with a public bakery to make economic use of the furnace and the firewood.

As traditional Muslim cities were not always equipped with a complete irrigation system reaching every single house, "sabils" (public fountains) were constructed in the main streets and in important residential alleys, which became important visual references and social meeting points. Apart from providing comfort, their trickling added a reminiscence of the cool oasis and the heavenly realm evoked by the Qur'an. In certain cases, the sabils were combined with an upper balcony which served as a children's school. Such composite structures, called "sabil-kuttab", were extensively

115 Section through a hammam in Cairo, showing entry hall to the right, followed by the intermediate room and the steam-room towards the left (after P. Coste).

116 Inside a Turkish bath in Istanbul (after R. Walsh).

117 Late 19th-century view of the gateway to the welfare compound of Sultan Qalaun (see page 118), with "sabil kuttab" attached to the left. The fountain on the ground floor is partly hidden by encroaching shops. The upper loggia was used for teaching children.
used along the main streets of medieval Cairo, often in conjunction with mosques, madrasas or mausolea, and marked important corners or bifurcations of the public street network. Sponsored by the local rulers or rich notables, they were to provide a service to the local community and to keep the name of the pious sponsor alive.
Components of Urban Form III: Trade and Production Structures

Stretching from North Africa to Turkestan, the Islamic world soon assumed a key position in intercontinental trade, which remained unchallenged from the 8th into the 16th century AD. Many luxury products, such as spices, incense, fine clothes, rugs and precious stones, which were increasingly coveted in medieval Europe, had to be transported through the Middle East or were processed there by local craftsmen. The “Silk Road” through Transoxania and Iran, as well as the frankincense trail through the Hejaz, served these intercontinental transactions. They were complemented by the sea routes through the Indian Ocean, the Gulf and the Red Sea – all leading to major Muslim port cities, where commercial exchange could take place. The radial caravan routes of the Hajj, passing through intermediate stations such as Tunis, Cairo, Baghdad and Damascus before eventually converging in Mecca, established an equally important network, which performed both religious and economic functions.

Thus Muslim countries held the monopoly on international East-West trade until Europe, during the age of discovery, started building up its own overseas trade network. The decisive event was the discovery of the sea route to India around the southern tip of Africa, which provided Europe with an alternative connection to the Far Eastern markets, bypassing the Muslim dominions. But even after the establishment of this new route in the early 16th century, the old trade centres of Damascus, Aleppo, Cairo, Istanbul, Isfahan or Samarkand remained important turnover points of international and inter-regional commerce, benefiting from their strategic geographic location. Many of these ancient cities were convenient stations on the age-old caravan routes crossing the vast Middle-Eastern desert areas. Their central markets, besides serving as an outlet for local production, were also equipped for stocking merchandise and for wholesale and retail trade in imported goods. Several European nations or city states had permanent missions residing in these places, in order to manage and supervise their intercontinental trade activities.

Since the early days, commerce was a vital component of Muslim urban life, and the markets always occupied a prominent position in the city centre in conjunction with the Friday mosque and related social welfare buildings. The strong interaction between religious and commercial activities was
explicitly endorsed by the Qur'an, and it became one of the hallmarks of traditional Muslim cities. The roots of this tradition can be seen in the history of Mecca, which was not only an ancient place of pilgrimage but also a striving centre of caravan trade.

While the central market of the big capitals provided the outlets for the international trade network, there was also a system of more modest local markets, anchored in age-old exchange customs and operating since the earliest times of Islam. The local markets could function within a city, a village or even on the edge of the desert. In the country, they were usually held on a weekly basis and provided meeting opportunities for a dispersed Bedouin population. Sometimes they were enclosed by walls; yet in general, their setting was rather informal. The merchandise was displayed on the ground, leaving a number of free lanes between the open-air "shops", which could be covered by improvised tents. These informal market patterns could also extend into the urban realm, with ambulant vendors benefiting from the pedestrian flows around the gates, on the main arteries and close to the main mosques. Up to the present time, this habit is very much alive in many Muslim cities, including Mecca and Medina, where pilgrims sell specialities from their home country around the Haram in order to do business and recover some of their travel costs.

The right of temporary occupation of available public ground for trade purposes relates to the old customary law of Bedouin societies and was practised since the early times of Islam in Medina, as well as in the first garrison towns in Mesopotamia such as Kufa and Basra. The formalization of these early informal market structures and their conversion into permanent urban suq structures first occurred during the Umayyad period. We know for instance that the caliph Hisham (724–743 AD) ordered his governor in Medina to construct a walled double-floor structure with arcades and gates in order to accommodate the central market. The Roman provinces offered many opportunities for such commercial compounds, and it is not surprising that Syria offers the most interesting examples of the formation of early Muslim suq structures. When the square of the old agora in Aleppo was vacated to construct the Umayyad Mosque, the resident merchants were shifted to a separate enclosed structure near the western gate – a building which must have been a precursor of the later caravanserais or khans. Simultaneously, the colonnaded main avenue was invaded by street vendors who started occupying not only the bays of the lateral arcades but also the central part of the avenue, which was no longer used by carriages and therefore offered abundant space for pedestrian circulation. This vigorous new commercial activity must soon have led to the construction of parallel rows of little stalls and huts, which eventually grew together and split the

119 Vernacular ways of setting up a rudimentary suq structure continue up to the present day: rural market near Mulay Idris (Morocco).

120 Improvised booths on a large public open space between the old and the new city, in Marrakesh.
large avenue into a number of parallel smaller lanes. Later, the informal arrangement was replaced by vaulted architectural structures which “monumentalized” the original pattern, retaining the additive structure of small cellular shops and the constituted pedestrian flows.

The typical formal structure of many later suqs was thus achieved by the progressive architectural accretion of hundreds of small niches bracketing the most busy sections of the public street network. Most shops resembled simple cupboards, which had to be opened from the alleyway and could accommodate just the shop owner and his basic stock. Often the shop owner would sit on a raised bench, from where he could easily scan the stream of potential clients, and he would encroach upon the public space to display his merchandise and receive his customers. Usually, each shop had an awning projecting into the street to create a small protected ante-room, where people could meet, sit down, negotiate or chat under the “umbrella” of exposed merchandises, while passers-by would use the median section of the street. The suq therefore transformed the street into a (predominantly male) social meeting place which, beyond its commercial purpose, became the major centre for exchanging all sorts of news. In many Muslim cities, this major public function was acknowledged by covering the central sections of the market and converting the most important suqs to generous halls and arcades (see pages 122 and 131).
The single cells of the suq corresponded to the highly individualized pattern of the traditional economy, which operated on the basis of a multitude of small enterprise units. Yet at the same time, the system also favoured the integration of individual cells into larger units of commerce and production which corresponded to professional and social entities and reflected the corporate organization of commercial and industrial activities. In spatial terms, there was the possibility of either forming linear series of individual shops along both sides of pedestrian thoroughfares or providing angular compositions around an enclosed courtyard, accessible by a single entry/exit point. In both cases, the framed open space was controlled and maintained by the respective trade or production unit, which had to concede public access to the occupied space.

The linear arrangement produced the ubiquitous suq structures of the Islamic city – long shopping alleys, which could easily be subdivided into interconnected individual sections. The spatial integrity of each suq section was safeguarded by gates which could be closed at night, so that accessibility to the central market sector could at times be interrupted, much in the same way as in the residential clusters. Individual suq sections could also be duplicated by parallel units placed “back to back” or enlarged into wider systems by conjunction with perpendicular units, in order to form more complex market units in the inner city.

The angular composition produced spatial “pockets” instead of linear sequences and led to the formation of the typical caravanserai structure, which usually served storage, wholesale, production and accommodation purposes rather than retail trade. The names given to those structures varied from region to region: the term of “khan” was used in Persia and most of the Middle East, “wakalla” in Egypt, “funduq” in the Maghreb and “samsara” in Yemen. Due to their tight enclosure walls and the central courtyard, the caravanserais were independent structures and could either stand on their own (as in the case of the isolated khans offering shelter along the major caravan routes) or be integrated into the urban fabric. There they often filled the “meshes” in the grid of the suq, being located right behind the lines of shops, with only the entry projecting into the front row of suq shops. The entry gate of major khans could be connected with a dome covering the alleyway in front of it, which often led to the formation of strategic nodes punctuating the suq network.

Usually the khans consisted of a double or triple floor structure with a lower portico and upper galleries, allowing for a variety of functions: on the ground floor they offered compartmentalized storage space for local wholesalers or visiting merchants and, if needed, stables for the animals of their caravans. Offices and workshops could be located on the first floor,

124 Example of an isolated 13th-century khan in inner Anatolia (after A. Gabriell).
125 Khans included in the suq network west of the Umayyad Mosque of Aleppo, as seen from the top of the minaret.
while the uppermost levels were mostly reserved for rooms and apartments which could be rented by visitors and merchants. Thus the khans provided an essential backup for the suq, with all the necessary support facilities. But their most important contribution to the city was perhaps the integrated open space which, within a few steps from the crowded streets, provided a welcome change of environment. As many of the central suqs tended to be roofed by permanent vaulted structures, gabled roofs or more improvised shading devices, the contrast between the enclosed main sections of the market and the islands of open space offered by the courtyards of the khans was a source of considerable enrichment for the townscape.

A special element of many cities, which could be interpreted as a hybrid between a covered caravanserai and a grouping of closed suq units, was the "qissariya" complex (called "bedestan" in Turkey). It was always located within the network of the central markets. Its name is derived from the imperial hall of the Roman and Byzantine markets ("Caesaria"), and like its predecessor it formed a specially enclosed and protected district – either a pillared hall or a series of contiguous suqs – accommodating the trade in the
most precious articles such as silk, gold and jewelry. It thus became the "treasure house" of each central market complex and was often located close to the most prestigious mosque of the city. During the night it was locked and guarded by watchmen.

As the public space of the city centre was always dominated by the Friday mosque, it is not surprising to observe certain trade hierarchies in relation to the mosque, which were reflected in corresponding locational preferences. While there were no formal rules in this respect, it was natural that the required ritual cleanliness of the prayer space excluded all transactions

126 19th-century view of the main north-south spine of historic Cairo, which was framed by a series of important public buildings and mausolea sponsored by the rulers of the Ayyubid and Mamluk dynasties. Most of these endowed buildings were erected to provide integrated commercial facilities on the ground floor and to generate income for their maintenance. The stairs leading up to the main floor are hidden behind a second line of informal market activities with booths occupied by ambulant vendors and artisans. To provide shade, a timber roof was fixed over the street (after D. Roberts).
127 View of one of the main lanes of the covered bazaar in Istanbul (after R. Walsh).

128 Detail of the comprehensive plan of the covered bazaar in Istanbul, showing two bastions integrated into the network of covered markets.
involving polluting products in the immediate surroundings of the mosque. The preferred trades in this area were those dealing with noble matters such as perfumes and spices, or those related to the mosque’s academic function, such as manuscripts and book binding. Precious imported goods and the finest locally produced articles also gravitated towards the Friday mosque or the qissariya. A certain basic retail geography was thus established in the city centre, which did not greatly change from one city to another, allowing for easy orientation within the manifold compartments of the central suqs. Most trade branches were concentrated in specific locations, and although the respective corporations (comparable to the medieval guilds in Europe) did not develop an institutional profile, they existed as a social reality and had a clear impact on the land use of the city. (An example of the location of various trade branches in relation to the mosque is given in the map of the city centre of Fez, on pages 144/145.)

The distribution of production activities was dictated by the sequence of manufacturing processes, from the raw material to the finished product, and by space requirements and circulation constraints within the city. Raw materials such as timber, agricultural products and livestock were sold in special open markets at the periphery of the city, within or outside the gates, and then underwent a first stage of processing or storage in areas close to the

129/130 Section, plan and view of a typical covered suq with integrated booths and projecting shutters (shoemakers’ suq in Marrakesh).
131 Courtyard of the caravanserai of Sultan al-Ghuri in Cairo (around 1500 AD), with commercial and storage space on the two lower floors (under the arcades) and a series of multi-floored apartments for rent above.

132 Combination of linear suq structure with enclosed khans in the central bazaar of Kashan, Iran (after Ardalan).
gates, where sufficient open space or large storehouses and manufacturing places could be made available. Each step of further refinement in the chain of artisanal production meant easier transportation, processing, stocking and selling, and thus facilitated the absorption of goods by the dense and crowded central suq system.

Some materials needed by the craftsman, such as clay and lime, were often available within the city walls, but the potters and their kilns had to remain at the periphery. The chain of wool and textile production, as well as that of leatherwork, depended on raw skins which had to be tanned, trimmed and dyed. These processes were subject to the availability of abundant water supplies, which often meant that compromises had to be made with other users or with adjacent residential areas. The stages of the various pre-industrial production chains called for repeated intermediate transactions, which could include wholesale, special auctions, or retail to craftsmen and private users. At some points, home production would interact with these commercial activities, as families sold their surplus production or acquired materials for additional crafting by the ladies of the house, which could later be sold back to the market.

The interchange between the different manufacturing chains shaped the complex sequence of production and trade, which culminated in the retail of refined goods in the central markets. The suqs were grafted on the main spines connecting the city gates and the heart of the city, complemented by a number of parallel alleys and cross-links in the central area. They were subdivided into specialized sectors, allowing customers to review the avail-

133  Cloth market in the old suqs of Aleppo.
134  The covered street of the carpenters in Quezzane (Morocco).
135  The tanners’ district in the old city of Fez, located in the heart of the city due to the availability of a natural spring.
able retail choice in one single location. Walking from the periphery to the centre, a visitor could thus find a cross section of locally available goods in increasing degrees of refinement. The shops of the main streets were the visible outlets of this production, but behind them there were several layers of wholesale and manufacturing, sometimes immediately behind the screens of shops (in the case of the big khans and wholesale stores), sometimes in more remote production areas, immersed in the urban fabric. However, the transport of semi-finished goods from one station to another gave clear evidence of this commercial network and constituted a major activity in the streetscape of traditional Muslim cities.
The Deep Structure of the Traditional Urban Fabric

Historic Muslim cities in the Arab World show a variety of origins and growth patterns. These were conditioned on the one hand by external factors such as pre-existing settlements, deliberate locational choices and prevailing dynastic evolutions and changes, and on the other hand by internal factors such as the morphological principles implied in individual architectural components and in the genesis of the urban fabric.

In our context, morphology refers to the underlying shaping forces of urban form which, drawing on related, deep-rooted human attitudes, constitute the real agents of physical manifestation and are the source of the non-material qualities transpiring through material expressions. While the ultimate objective of this chapter, rather than tracing the evolution of individual cities, is to shed light on these internal structuring processes, it may nevertheless be appropriate to first summarize the external factors of historic urban development, before venturing into the more complex morphological issues.

It has often been claimed that Islam, due to its Arabian origins, was not an urban civilization; yet its ethics and social order favoured a strong community life and in fact resulted in an almost instant revival of pre-existing urban traditions under changed spiritual auspices, specially in the Near Eastern area, which became the first target of early Arab-Islamic immigration. As pointed out in chapter 3, the surviving physical structures of late Roman-Hellenistic cities in Syria (such as Damascus and Aleppo) became the setting for the cultural encounter between the Arab immigrants and a local sedentary population that was gradually converting to Islam. By the same token, these cities were to serve as melting pots for a novel urban civilization which, being strongly imprinted by Muslim community ideals and highly ritualized daily living patterns, eventually led to the progressive transformation of pre-Islamic urban structures.

The locational choices of historic cities in the Arab world generally depended on prevailing trade routes and geopolitical considerations, the availability of natural resources (such as perennial water supply and an agricultural hinterland) and, in some cases, on the religious significance of certain places. In most cases a combination of several of these factors was involved in determining the city’s site and growth: the holy city of Mecca...
was already a centre of pilgrimage and trade before the advent of Islam, benefiting from a famous spring which added to its attraction. Medina grew in an oasis and was a welcome station on the frankincense trade route. Damascus and Fez relied on rich water resources and were located at crossing points of important regional trade connections – an advantage which had already been exploited in Roman-Hellenistic times in the case of Damascus. Cairo and Baghdad were founded at strategic geopolitical locations, benefiting from the Nile and the Tigris rivers. Local crafts and commerce, especially if supported by a strong local dynasty and its court, boosted the importance of emerging urban centres, as did the presence of venerated saints and holy men, who often provided legitimation to ruling dynasties and created an additional stimulus for city growth.

Whereas most of the above-mentioned locational choices are generally applicable to pre-industrial cities, the impact of the ruling class, and particularly the development patterns resulting from the succession of individual dynasties, produced distinct characteristics representative of the urban history of Muslim societies. The distant tribal origin of many conquering dynasties, for instance, meant that these rulers were not really rooted in the local population. The same applies to the chain of Mamluk rulers which was not of dynastic character, since it involved a military hierarchy based on the selection and the eventual rise of slave-soldiers brought in from Central Asia. Furthermore, once the ideal caliphate of the early days had passed away, the actual holders of power, as stated by Ibn Khaldun, were seen as a “necessary evil” needed to support and protect the religious community, rather than being acknowledged as the legitimate peak of an organic social hierarchy. This explains why the camps, residences, palaces and citadels of the ruling dynasty were mostly set apart from the city of commoners, the latter structure being much more marked by local crafts and trade, by the religious institutions, by the traditional community facilities and by a strong intellectual and spiritual life of its own. In most instances and particularly in the case of military dynasties, the ruler was not considered as an integral part of the ideal Muslim “civitas”, which found its more appropriate reflection in the vernacular town, as developed under the influence of the local bourgeoisie and its notables.

Accordingly, the rulers’ residential cities were usually founded outside, or at best adjacent to existing urban nuclei and implied separate functional systems and often different, more formal and highly abstract layouts. A prominent example is the plan of the Abbasid “Round City” of Baghdad (762 AD), which was strongly influenced by Iranian cosmological concepts – ideas no longer pursued in Muslim town-planning of later periods. Although no archaeological traces of the “Round City” have survived, its
plan was related by contemporary authors in such detail that a diagrammatic reconstruction could be attempted. Another example is the Fatimid foundation of Cairo (969 AD), laid out as a fortified palace city with a central north-south axis, not unsimilar to Roman-Hellenistic city plans. The Marinid city of Fez-Jdid, founded in the 14th century, although less formal in plan, is a good example of the attachment of a palace and administration town to an existing urban nucleus. It is significant that it was situated uphill in a dominant position, controlling all of the water resources flowing into Fez al-Bali (the old Fez). In Cairo, Granada and Aleppo, the 12th-century citadels, although within or very close to the existing urban structures, were vertically separated from the city of commoners.

Looking at the development of Baghdad and Cairo over the centuries, another interesting phenomenon can be observed, which became typical for many Muslim cities: as certain dynasties were ousted or substituted, the old residences were abandoned or replaced by new palatial settlements or citadels, with the result that the city's centre of gravity started shifting and

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138 The various successive or simultaneous components of historic Cairo around 1800 (After J. Abu-Lughod).
1 Location of the first Arab settlement of Fustat (7th century)
2 Former site of the Tulunid city of Qata' i (late 9th century)
3 The mosque of Ibn Tulun
4 The Fatimid city founded in 969
5 Main spine of the Fatimid city
6 Ayyubid citadel
7 Cemeteries
8 River-port district of Bulaq (17th-18th century)
often continued to do so over long periods. In the case of Cairo, the 10th-century Fatimid palace was built two kilometres north of the earlier origins of the Muslim city located at Fustat, the first encampment of the military force which had set out to conquer Egypt in the 7th century. In the 8th century, Ibn Tulun, a governor of the Baghdad-based Abbasid dynasty, had already founded his own palace north of Fustat, whereas the original settlement extended into an important city of trade called Misr, which burnt down in the 12th century. The rise of the Ayyubid dynasty saw the construction of Saladin’s citadel, started in 1176 AD, while the old Fatimid palace city was left to the local bourgeoisie. The site of the destroyed palace itself became the building ground for the splendid social welfare complexes constructed by the Ayyubid and Mamluk sultans between the 13th and the 15th centuries, combining mausolea with madrasas, prayer halls, hospitals and public fountains. While these royal “waqfs” fostered new focal points in the urban system, the rulers themselves lived in separate locations outside the city, which increasingly took on the character of military strongholds, especially during the period of the Crusades.

It is worth mentioning in advance here that the segregation of the ruler’s palace and the military establishment from the vernacular city anticipated similar choices related to the siting of colonial cities, as created by the Ottoman and the European powers during the 19th and early 20th centuries.
This later development – the first step to an either evolutionary or abrupt modernization – could thus build on a pre-existing logic of urbanization patterns although, in the case of colonialism, the corollary introduction of an alien cultural system did not favour a smooth integration.

Ethnic migrations, not infrequent in the Muslim world, could also lead to the foundation of separate town units, or to the informal growth of new suburbs “extra muros”. Such new quarters often clung to one of the main gates of the walled city and developed along major routes of caravan traffic, whose loading and unloading point was, obviously, at the city gates. The plans of Aleppo and Damascus illustrate this phenomenon with their extensive informal additions to the walled city, going back to the 15th century. The location and the development patterns of such suburbs often reflect the geographical direction of their rural catchment area or, in the case of Midan (the southern suburb of Damascus), the district’s function as a turn-over and departure place geared to the caravans leaving for and arriving from Mecca.

Accordingly, the historical development of large Arab cities often shows a shift of gravity centres, with old quarters being abandoned or re-used by different populations. This went hand in hand with a complex aggregated
structure, based on the juxtaposition of self-contained and largely autonomous community units of different ethnic, religious or functional character. The Jewish quarters of Muslim cities are no exception to this; they reflect the deliberate autonomy granted to discrete ethnic and tribal groups within a pluralistic and multi-focal urban development pattern, rather than the modern “ghetto” concept.

From an urban design point of view, it has been stated by several authors that historic Arab cities show either “spontaneous” or “planned” urban patterns, the former being related to more vernacular urban configurations (sometimes of rural origin), the latter being defined by the formal layouts of palace cities. While there is some truth in this distinction, one could also argue that the planned palace cities were a response to military concepts and to princely representation needs which were not typical of the common Muslim city. Here, the strong social order of Islam (practised in conjunction with equally strong customary laws), the conspicuous absence of formal civic institutions and the ensuing empowerment of self-regulating private communities and social groups resulted in a particular type of space management which was reflected in “organic” growth processes, i.e. an urban form grown from within, so to speak, and conditioned by incremental decisions at grass-root level, rather than obeying imposed external schemes. Thus the orthogonal grid system, where it existed, was gradually overgrown by a vernacular pattern, based on the common appropriation and transformation of public space by the various social groups, as can be seen in the 19th-century plan of Fatimid Cairo recorded by the Napoleonic expedition. This resulted in an overlay of often tortuous residential access lanes and cul-de-sacs reflecting the prevalent “spontaneous” urbanisation mode – not unsimilar to the mutation of the Roman-Hellenistic grid pattern in Damascus and Aleppo.

Since the intention of this book is to present and to analyse the incrementally grown morphological patterns of Arab cities, rather than focusing on the architecture of power and its formal expressions, we shall now concentrate on the more vernacular aspects of urban form, as encountered in the surviving structures of historic cities such as Aleppo, Damascus, Fez, Tunis or Baghdad. These urban structures, admittedly, represent a late stage in the evolution of urban form, stretching over the last three or four centuries, and yet they reflect perennial principles and attitudes firmly rooted in traditional community life and in certain tribal customs, which can be traced back to the “khittat” system, as practised in the first centuries of Islam. The following remarks therefore relate to this ubiquitous archetype of traditional Arab urban form, with a view to understanding its dominant functional
model, as well as the inherent concept of order which produced its singular physical character. In doing so, we will rely on the previous typological descriptions of the various architectural components, showing how they interacted to form a comprehensive and coherent urban fabric without ever losing their individual spatial identity.

The main land-use patterns of the historic Arab-Muslim city are usually focused on a multifunctional core structure enveloping or at least partially surrounding the central mosque by different layers of interconnected suqs. As a rule, these are interspersed with a number of hammams, madrasas and

141 Map of Cairo recorded around 1800, during Napoleon’s campaign in Egypt. (The dashed lines indicate the boundaries of the former Fatimid city.)
1. Tomb and mosque of Mulay Idris
2. Qairawiyin Mosque
3. Mosque library
4. Former residence of the judge (kadi)
5. Hall for mortuary prayer services
6. Former stand-by place of notaries
7. Ablution room / toilets
8. Attarin Madrasa
9. Mesbahia Madrasa
10. Seffarin Madrasa
11. Sherratin Madrasa
12. Public bath (hammam)
13. Private residence formerly used as marriage house
14. Former hospital (maristan)
15. Spice market, with specialised parallel and perpendicular branches of the suq
16. Former booksellers’ suq
17. Perfumers’ suq
18. Qissariya complex (precious fabrics and jewellery)
19. Jellabah suq (traditional dresses)
20. Carpet suq
21. Pottery suq
22. Carpenters’ suq
23. Square of the coppersmiths
24. Caravanserai (funduq)
25. Former residences now converted to exhibition rooms, restaurants and shops
Plan of the traditional city centre of Fez al-Bali, showing the close interrelation existing between mosques, madrasas, suqs, caravanserais and residential districts.
caravanserais which constitute the support system for the mosque and the retail shops. The unique symbiosis between religious, educational, social and commercial functions is expressed in the volumetric assimilation of the mosque building into this complex central compound. Indeed, the pillared halls of the mosque and its roofing system often show striking analogies to the arcades of the covered suqs, the only difference being that the mosque is a permeable structure, thus allowing for multiple uses and large congregations. The minaret, and possibly one or several larger domes, are the only elements emerging from the continuous roofscape which extends like a blanket above the aggregated volumes. The large central courtyard at the heart of the friday mosque becomes the primary public open space of the central compound and, to some extent, of the city as a whole. As the central mosque is often enmeshed in a system of surrounding alleyways or suqs, it is usually accessible from different sides through a number of entry gates. Once one has passed the threshold which protects the ritual purity of the mosque space, the central courtyard is easily entered from the suqs, either directly or through the prayer hall.

Whereas the compactness of this central compound, based on its exclusively pedestrian movement mode, clearly compresses the available public space within the suqs, it is balanced by the courtyards of the ancillary or satellite buildings, such as madrasas and caravanserais. They are meant to
provide compensatory public space off the covered main alleyways and are allocated to more specialized functions and social needs. When moving through this highly articulated complex, the visitor experiences a distinct feeling of spatial continuity transcending the limits of individual buildings and connecting the various realms of public life. Yet at the same time, he receives clear physical guidance with respect to the differentiation between different sectors. A subtle visual reference system relates to accepted (and expected) codes of social behaviour within the given urban compartments. Each individual realm carefully retains its specific spatial character, while interacting with neighbouring units through distinct architectural devices, such as intermediate gateways, internal passages, thresholds and communicating doors. Hence the impression of meandering through a seemingly endless series of interconnected chambers within a highly articulated and yet homogeneous urban universe.

In such urban structures everything seems to be “under one roof”, and thus the city can be compared to a spacious but coherent single mansion. By analogy, the mosque would be the main living room, the madrasas and caravanserais would correspond to the teaching room, guest rooms and utility rooms, and the suqs, equipped with long rows of cupboards, would represent the connecting internal corridors. The residential districts, as will be shown below, provide the private quarters of this collective urban

144/145 Contrast between a central market spine in Fez (left) and a secluded dead-end access to a residential cluster (right). Beyond the threshold of individual houses, a bent and fully private interior corridor leads to the courtyard, the hub of each house.
“house” and are structured along similar principles as the public places but with greater emphasis on the articulation of intermediate passages.

The multifunctional central compound of the town is linked with the outer gates via a number of main spines, ensuring communication between the interior and the exterior of the walled city. The main gates constitute important secondary centres of the urban system, inasmuch as their traditional function is to act as turn-over points for the loading and unloading of wholesale merchandise and materials brought from the rural hinterland, which could not enter the fine-grain system of the inner city without prior stocking, processing and distribution to retailers. Accordingly, the gates had to sift the flows of people, animals and goods in such a way as to avoid excessive congestion in the inner circulation system. For this reason they offered more abundant (and less structured) open space, surrounded by caravanserais with convenient lodging and storing facilities, wholesale markets and large workshops.

As a rule, the centripetal main spines leading from the gates to the city core became narrower as they approached the central markets. They were lined with a multitude of shops, framing the primary pedestrian flows and taking commercial advantage of potential clients. Besides establishing a functional continuity between the central suqs and the gates, these lines of shops (and the occasional rows of caravanserais behind them) accomplished a second, less obvious purpose within the logic of this urban system: they served as protective shields, hiding the adjacent residential districts and keeping them free of undesirable intrusions. Small gates, discreetly placed

146 Open market in the buffer space behind the the southern gate (Bab Yemen) of the old city of Sana‘c.

147 Former orchards on the periphery of the walled city of Fez, partially overgrown by the expanding fabric of the old residential districts.

148 Bird’s-eye view of the Bob Ginasreen district in Aleppo (see plan on page 151) showing interacting solids and voids within the residential clusters.
between the rows of shops, marked the entrance to distinct residential clusters; they were followed by an elaborate system of narrow alleyways, internal passages and gateways before the thresholds of individual houses could be reached and the transition into the domestic communication system on the other side of the entrance door could occur. These devices helped filter the flow of people, managing step by step the shift from public to private space which was so critical for the life and integrity of the Arab city.

The residential quarters "intra muros" grew in the space left between the edges of the multifunctional core complex and the main pedestrian spines.
crossing the city, everything being contained by the outer city walls. As a rule, the housing units tended to stay as close as possible to the central area, in the vicinity of the Friday mosque, where the oldest and most prestigious families used to settle. In the remaining open area towards the city wall, there was a fringe of private orchards, which provided the residents with part of their sustenance. This agricultural space tended to diminish over time, as it was occasionally used for cemeteries (though most of them were located “extra muros”), for certain crafts, such as potteries, or for the needs of the expanding housing clusters. In their gradual growth process, housing clusters would often absorb the pre-existing agricultural pathways and irrigation systems which, once internalized, became subservient to the residential units. By the same token, the former undifferentiated open space reappeared in a fragmented manner within the residential units, in the form of enclosed garden courtyards belonging to the newly built individual houses, which were often much more spacious than the houses in the crowded inner city.

As described in chapter 4, the structure of the residential quarters was generated and sustained by strong micro-communities, often sharing the same tribal origins. These neighbourhoods were largely self-reliant in the
sense that each one formed a virtually autonomous social unit, embracing a representative cross section of society and establishing, controlling and maintaining the basic shared facilities, such as a local mosque, one or several small hammams and public ovens (the latter tended to be built side by side with a shared heating system), and a number of street fountains. The irrigation networks and the internal access system connecting the houses with the major public thoroughfares were also controlled and managed by the neighbourhood communities. The public space of the central suqs, by contrast, were controlled by the trade and craft corporations and supervised by the muhtasib.

In most cases, the identity of each small residential cluster was physically defined by more or less hidden enclosures, composed of the contiguous outer walls of the group of houses laid out around a shared dead-end alleyway (see page 39). The impasse itself could be closed by a gate, thus transforming it into an interior space. This access system was the preferred solution at the residential micro-scale, as it allowed for selective gradual privatization of public space and direct control by the owners of the adjacent houses. By mediating in a subtle manner between the "inner" and the
dors. The houses can only be seen and experienced from within and do not depend on external open spaces. The self-contained character of each housing unit and the vertical orientation of its courtyard thus enables lateral merging of different individual structures.
1  Public alleyway
2  Maktabi house (nr. 7 in plan)
3  Maristan Arghun (nr. 5 in plan)

152 Composite north-south section through the plan on page 150 (Fez).
"outer" world, it enabled the self-contained units of individual houses to merge and to become components of a coherent residential cluster, which in turn was entrenched within a larger multi-cluster unit representing a complete neighbourhood. At the respective hierarchical level, each residential unit of the urban structure had its own inbuilt circulation system, the individual sections and ramifications being separated and connected by interior gates that preserved the territorial integrity of the various sub-communities. Joining individual units, whether houses or clusters, was not a matter of loose juxtaposition but implied a structural assimilation which would step by step absorb and incorporate entire building blocks into the larger urban system.

This progressive integration process would not have been possible without the consistent use of an omnipresent cellular composition system of attached, interconnected or overlaid precincts with enclosed circulation systems, repeated in various sizes and at various hierarchic levels of the urban structure. The merging and overlapping of discrete architectural shells into more complex patterns created the extraordinary sense of inner unity and homogeneity which becomes apparent from the bird's-eye views of the residential fabrics of traditional Arab cities – and even more so from the closer analysis of corresponding ground floor plans. Interestingly, such patterns

153 Diagram exemplifying the consistent cellular composition of the urban fabric in the Maghreb. The repetition of similar patterns of enclosure and inclusion, throughout various hierarchic levels of the complex built form, results in complete structural integration.

154 Schematic plan identifying the main enclosures or "containers" of the urban system of Fez, which traditionally could be locked by gates and separated from the main circulation paths. Among these containers are the main mosques, the closed sections of the central market and the many residential clusters around collective dead-end alleyways or "darbs". The partition lines between the residential clusters, composed of the walls of the outermost housing units, form a series of invisible enclosures within the city walls.
allow for multiple interpretations, since the continuous cellular structure blurs the division between individual components, with the effect that architectural units transcend their original definition and can be read differently at different levels and scales of the urban structure. The incrementally ("naturally") grown urban fabric thus produces structural effects not unsimilar to those encountered in the much more crystalline, deliberately designed geometric patterns of Islamic art. In both cases, the secret of cohesion and inner unity within a rich variety of individual formal expressions relies on the presence of vertical chains of analogies and correspondences as the main principle of either inductive or deductive structural compositions.
Looking at the urban fabric as a whole, and remembering the earlier chapters on architectural typology, one discovers the great affinities between public and residential buildings, relating to both the vocabulary of complex individual structures and the way in which the composite elements are interconnected and incorporated into larger compounds. The main difference in the mode of connection appears when it comes to the shift from the public to the private domain. Here it was necessary to insert appropriate resistances and retardation effects. The transition was often achieved by extended, deliberately tortuous access lanes and by buffer spaces controlled by gates and thresholds. Market compounds and residential clusters could be placed in adjacent locations, sharing their enclosures "back to back", but without direct communication - a system which enabled both functional division and volumetric interlocking.

Thus the typical urban form of historic Arab cities grew as a compact aggregation of smaller and larger precincts, each one equipped with the appropriate cellular infill, as well as inbuilt open spaces, access systems and shared facilities allocated to the respective groups of collective and individual users. The fact that all these micro-elements of urban form shared the same structural principles, in spite of different functions, made them fully compatible. Their largely self-centred and self-contained character, due to the vertical orientation of interior courtyards and air shafts, facilitated horizontal cohesion, favouring their integration into larger urban components which were complete in themselves at each stage of development, in space and in time.

By a series of centring, enclosing and incorporating processes through ascending hierarchic levels of the urban structure, this remarkable system of space management produced a differentiated and yet totally homogeneous type of urban form, where the divisions provoked by isolated public open spaces and an incisive street network were avoided or overcome. Since the adopted circulation system made it possible to select and regulate the desired degree of seclusion within a continuous and extremely dense urban fabric, it was the ideal tool for neutralizing the antagonism between open and closed spaces, public and private zones, and male and female realms. The polarity between opposite qualities, while balanced and resolved within the overall structural pattern, remained the spring of the urban system, producing the pulsations which kept the organism of the city alive.

In his perceptive morphological studies, Johann Wolfgang von Goethe wrote that the main driving forces of growth and metamorphosis in nature are polarity and gradation ("Polarität und Steigerung"), through their mutual interaction. Looking at our analysis of traditional Arab urban form, we
realize that it is precisely the combination of these two forces which bestows life, unity and an "organic" quality on its vernacular urban patterns. It is indeed striking to observe how the polarizing force implied in the nuclear cellular structures (i.e. their articulation by division of space into "included" and "excluded" portions) provides clear separation between neighbouring buildings, while simultaneously exerting a strong contraction at the next structural plane of urban form. The "push-forces" at a lower level are so to speak transformed into "pull-forces" at an upper level, allowing the existing dualities to be absorbed by progressive integration into a higher order. This hierarchy occurs on virtually every plane of the urban structure, from the single room to the house, to the residential cluster, the market compounds, the enclosed street sections and the walled city as a whole. Potentially conflicting units can therefore be placed side by side and integrated into a highly articulate and cohesive overall system of urban form.

155/156 A typical example of "polarity" within the old city centre of Fez: the transition from the compressed street space of the spice suq (nr. 15 of the map on page 144), where all the streams of public life mingle, to the relaxed and contemplative open space of the Attarin Madrasa (nr. 8 on the map).
The result is a breathing and "animated" urban structure, projecting a radiant inner unity which is fundamentally different from the sterile uniformity produced by more mechanical modes of addition or subdivision. It is indicative of the higher (one could even say spiritual) nature of such a type of unity that it is capable of spreading and multiplying itself without ever losing its essential qualities. As it is present in every single "seed" of the complex cellular urban structure, the entire urban fabric down to its smallest particles is so to speak impregnated with the attributes of wholeness and unity. The city turns into a vibrant multi-focal pattern, embracing scores of self-contained sub-centres, which all share the "wholeness" of the overarching system. This structural order translates into a paradoxical physical experience which is characteristic of most traditional Arab cities: one always has the feeling of being at the centre of things, in whatever sub-unit of the composite urban structure it may be.

It can be concluded that the inner unity of the urban fabric is predicated on the capacity to express and articulate different needs in a consistent language of affiliated forms, based on the variation of cellular patterns at different hierarchic planes. The integration of individual components is sustained by multiple structural analogies and by ascending correspondences within the deep structure of the city. Thus the urban fabric gains access to a symbolic dimension, since small elements can reflect the structure of the whole in the same way that the human microcosm can mirror the universe. It is this hidden vertical reference system which gives depth and unity to the urban fabric, instils spatial quality to its individual components, and grounds man in his environment by inscribing his temporal urban existence within a timeless order.