دانشگاه پیام نور

دانشکده الهیات و علوم اسلامی

گروه تاریخ و تمدن ملل اسلامی

جزوه‌ی درس:

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دوره‌ی:

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گردآوری:

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# TRANSLITERATION

## Arabic Letters

| symbol | transliteration |
|---|---|
| ء | ' |
| ب | b |
| ت | t |
| ث | th |
| ج | j |
| ح | ḥ |
| خ | kh |
| د | d |
| ذ | dh |
| ر | r |
| ز | z |
| س | s |
| ش | sh |
| ص | ṣ |
| ض | ḍ |
| ط | ṭ |
| ظ | ẓ |
| ع | ' |
| غ | gh |
| ف | f |
| ق | q |
| ك | k |
| ل | l |
| م | m |
| ن | n |
| ه | h |
| و | w |
| ي | y |
| ة | ah; at (*construct state*) |
| ال | (*article*) al- *and* 'l (*even before the antepalatals*) |

### Long Vowels

| | |
|---|---|
| ا | ā |
| و | ū |
| ي | ī |

### Short Vowels

| | |
|---|---|
| ـَ | a |
| ـُ | u |
| ـِ | i |

### Diphthongs

| | |
|---|---|
| ـَو | au |
| ـَي | ai |
| ـيّ | iy (Final Form ī) |
| ـوّ | uww (Final Form ū) |

### Persian Letters

| | |
|---|---|
| پ | p |
| چ | ch |
| ژ | zh |
| گ | g |

*In the Name of God Most Merciful and Compassionate*

# *INTRODUCTION*

## *A. The Principles of Islam*

THE HISTORY OF SCIENCE is often regarded today as the progressive accumulation of techniques and the refinement of quantitative methods in the study of Nature. Such a point of view considers the present conception of science to be the only valid one; it therefore judges the sciences of other civilizations in the light of modern science and evaluates them primarily with respect to their "development" with the passage of time. Our aim in this work, however, is not to examine the Islamic sciences from the point of view of modern science and of this "evolutionistic" conception of history; it is, on the contrary, to present certain aspects of the Islamic sciences as seen from the Islamic point of view.

To the Muslim, history is a series of accidents that in no way affect the nontemporal principles of Islam. He is more interested in knowing and "realizing" these principles than in cultivating originality and change as intrinsic virtues. The symbol of Islamic civilization is not a flowing river, but the cube of the Kaaba, the stability of which symbolizes the permanent and immutable character of Islam.

Once the spirit of the Islamic revelation had brought into being, out of the heritage of previous civilizations and through its own genius, the civilization whose manifestations may be called distinctly Islamic, the main interest turned away from change and "adaptation." The arts and sciences came to possess instead a stability and a "crystallization" based on the immutability of the principles from which they had issued forth; it is this stability that is too often mistaken in the West today for stagnation and sterility.

The arts and sciences in Islam are based on the idea of

unity, which is the heart of the Muslim revelation. Just as all genuine Islamic art, whether it be the Alhambra or the Paris Mosque, provides the plastic forms through which one can contemplate the Divine Unity manifesting itself in multiplicity, so do all the sciences that can properly be called Islamic reveal the unity of Nature. One might say that the aim of all the Islamic sciences—and, more generally speaking, of all the medieval and ancient cosmological sciences—is to show the unity and interrelatedness of all that exists, so that, in contemplating the unity of the cosmos, man may be led to the unity of the Divine Principle, of which the unity of Nature is the image.

To understand the Islamic sciences in their essence, therefore, requires an understanding of some of the principles of Islam itself, even though these ideas may be difficult to express in modern terms and strange to readers accustomed to another way of thinking. Yet a statement of these principles is necessary here, insofar as they form the matrix within which the Islamic sciences have meaning, and outside of which any study of them would remain superficial and incomplete.

Islamic civilization as a whole is, like other traditional civilizations, based upon a point of view: the revelation brought by the Prophet Muḥammad is the "pure" and simple religion of Adam and Abraham, the restoration of a primordial and fundamental unity. The very word *islām* means both "submission" and "peace"—or "being at one with the Divine Will."

The creed of Islam—"there is no divinity other than God and Muḥammad is his prophet"—summarizes in its simplicity the basic attitude and spirit of Islam. To grasp the essence of Islam, it is enough to recognize that God is one, and that the Prophet, who is the vehicle of revelation and the symbol of all creation, was sent by him. This simplicity of the Islamic revelation further implies a type of religious structure different in many ways from that of Christianity. There is no priesthood as such in Islam. Each Muslim—being a "priest"—is himself capable of fulfilling all the religious functions of his family and, if necessary, of his community; and the role of the imam, as understood in either Sunni or Shia Islam, does not in any way diminish the sacerdotal function of each believer. The orthodoxy based on this creed is intangible, and therefore not so closely bound to specific formulations of dogmatic theology as in Christianity. There have been, to be sure, sectional fanaticism and even persecution, carried on

either by rulers or by exoteric theologians, against such figures as al-Ḥallāj and Suhrawardī. Yet the larger orthodoxy, based on the essential doctrine of unity, has always prevailed and has been able to absorb within the structure of Islam all that is not contradictory to the Muslim creed.

In its universal sense, Islam may be said to have three levels of meaning. All beings in the universe, to begin with, are Muslim, *i.e.*, "surrendered to the Divine Will." (A flower cannot help being a flower; a diamond cannot do other than sparkle. God has made them so; it is theirs to obey.) Secondly, all men who accept with their will the sacred law of the revelation are Muslim in that they surrender their *will* to that law. When ʿUqbah, the Muslim conqueror of North Africa, took leave of his family and mounted his horse for the great adventure which was to lead him through two thousand miles of conquest to the Moroccan shores of the Atlantic, he cried out: "And now, God, take my soul." We can hardly imagine Alexander the Great having such thoughts as he set out eastward to Persia. Yet, as conquerors, the two men were to achieve comparable feats; the "passivity" of ʿUqbah with respect to the Divine Will was to be transmuted into irresistible action in this world.

Finally, we have the level of pure knowledge and understanding. It is that of the contemplative, the gnostic (*ʿārif*), the level that has been recognized throughout Islamic history as the highest and most comprehensive. The gnostic is Muslim in that his *whole being* is surrendered to God; he has no separate individual existence of his own. He is like the birds and the flowers in his yielding to the Creator; like them, like all the other elements of the cosmos, he reflects the Divine Intellect to his own degree. He reflects it *actively*, however, they passively; his participation is a *conscious* one. Thus "knowledge" and "science" are defined as basically different from mere curiosity and even from analytical speculation. The gnostic is from this point of view "one with Nature"; he understands it "from the inside," he has become in fact the channel of grace for the universe. His *islām* and the *islām* of Nature are now counterparts.

The intellective function, so defined, may be difficult for Westerners to grasp. Were it not for the fact that most of the great scientists and mathematicians of Islam operated within this matrix, it might seem so far removed as to be irrelevant to this study. Yet, it is closer in fact to the Western tradition than most modern readers are likely to realize. It is certainly very close to the contemplative strain of the Christian Middle

Ages—a strain once more evoked in part, during the modern era, by the German school of *Naturphilosophie* and by the Romantics, who strove for "communion" with Nature. Let us not be misled by words, however. The opening of the Romantic's soul to Nature—even Keats's "negative capability" of receiving its imprint—is far more a matter of sentiment (or, as they loved to call it then, "sensibility") than of true contemplation, for the truly contemplative attitude is based on "intellection."

We should be mindful here of the changing usage of words. "Intellect" and "intellectual" are so closely identified today with the analytical functions of the mind that they hardly bear any longer any relation to the contemplative. The attitude these words imply toward Nature is the one that Goethe was to deplore as late as the early nineteenth century—that attitude that resolves, conquers, and dominates by force of concepts. It is, in short, essentially abstract, while contemplative knowledge is at bottom concrete. We shall thus have to say, by way of reestablishing the old distinction, that the gnostic's relation to Nature is "intellective," which is neither abstract, nor analytical, nor merely sentimental.

Viewed as a text, Nature is a fabric of symbols, which must be read according to their meaning. The Quran is the counterpart of that text in human words; its verses are called *āyāt* ("signs"), just as are the phenomena of Nature. Both Nature and the Quran speak forth the presence and the worship of God: *We shall show them Our portents on the horizon and within themselves until it will be manifest unto them that it is the Truth* (41:53).[1]

To the doctors of the Law, this text is merely prescriptive, Nature being present in their minds only as the necessary setting for men's actions. To the gnostic or Sufi, on the other hand, the Quranic text is also symbolic, just as all of Nature is symbolic. If the tradition of the symbolic interpretation of the text of the Sacred Book were to disappear, and the text thereby reduced to its literal meaning, man might still know his duty, but the "cosmic text" would become unintelligible. The phenomena of Nature would lose any connection with the higher orders of reality, as well as among themselves; they would become mere "facts." This is precisely what the intellective capacity and, indeed, Islamic culture as a whole

[1] *The Meaning of the Glorious Koran, an explanatory translation* by Mohammad Marmaduke Pickthall (London: George Allen & Unwin Ltd.; New York: New American Library, 1953), 2:255; 24:35. All subsequent references to the Quran are to the latter edition.

will not accept. The spirit of Islam emphasizes, by contrast, the unity of Nature, that unity that is the aim of the cosmological sciences, and that is adumbrated and prefigured in the continuous interlacing of arabesques uniting the profusion of plant life with the geometric crystals of the verses of the Quran.

Thus we see that the idea of unity is not only the basic presupposition of the Islamic arts and sciences: it dominates their expression as well. The portrayal of any individual object would become a "graven image," a dangerous idol of the mind; the very canon of art in Islam is abstraction. Unity itself is alone deserving of representation; since it is not to be represented directly, however, it can only be *symbolized*—and at that, only by hints. There is no concrete symbol to stand for unity, however; its true expression is negation—not this, not that. Hence, it remains abstract from the point of view of man, who lives in multiplicity.

Thus we come to the central issue. Can our minds grasp the individual object as it stands by itself? or can we do so only by understanding the individual object within the context of the universe? In other words, from the cosmological point of view, is the universe the unity, and the individual event or object a sign ("phenomenon," "appearance") of ambiguous and uncertain import? Or is it the other way around? Of these alternatives, which go back to the time of Plato, the Muslim is bound to accept the first—he gives priority to the universe as the one concrete reality, which symbolizes on the cosmic level the Divine Principle itself, although that cannot truly be envisaged in terms of anything else. This is, to be sure, an ancient choice, but Islam does inherit many of its theories from preexisting traditions, the truths of which it seeks to affirm rather than to deny. What it brings to them, as we have already said, is that strong unitary point of view that, along with a passionate dedication to the Divine Will, enabled Islam to rekindle the flame of science that had been extinguished at Athens and in Alexandria.

We have seen that the sacred art of Islam is an abstract art, combining flexibility of line with emphasis on the archetype, and on the use of regular geometrical figures interlaced with one another. Herein one can already see why mathematics was to make such a strong appeal to the Muslim: its abstract nature furnished the bridge that Muslims were seeking between multiplicity and unity. It provided a fitting texture of symbols for the universe—symbols that were like keys to open the cosmic text.

We should distinguish at once between the two types of mathematics practiced by Muslims: one was the science of algebra, which was always related to geometry and trigonometry; the other was the science of numbers, as understood in the Pythagorean sense. The Pythagorean number has a symbolic as well as a quantitative aspect; it is a projection of Unity, which, however, never leaves its source. Each number has an inherent power of analysis, arising out of its quantitative nature; it has also the power of synthesis because of the inner bond that connects all other numbers to the unit. The Pythagorean number thus has a "personality": it is like a Jacob's ladder, connecting the quantitative with the qualitative domain by virtue of its own inner polarization. To study numbers thus means to contemplate them as symbols and to be led thereby to the intelligible world. So also with the other branches of mathematics. Even where the symbolic aspect is not explicitly stated, the connection with geometric forms has the effect upon the mind of freeing it from dependence upon mere physical appearance, and in that way preparing it for its journey into the intelligible world and, ultimately, to Unity.

Gnosis in the Alexandrian world had used, as the vehicle for the expression of its doctrines, a bewildering maze of mythology. In Islam, the intellective symbolism often becomes mathematical, while the direct experience of the mystic is expressed in such powerful poetry as that of Jalāl al-Dīn Rūmī. The instrument of gnosis is always, however, the intellect; reason is its passive aspect and its reflection in the human domain. The link between intellect and reason is never broken, except in the individual ventures of a handful of thinkers, among whom there are few that could properly be called scientists. The intellect remains the principle of reason; and the exercise of reason, if it is healthy and normal, should naturally lead to the intellect. That is why Muslim metaphysicians say that rational knowledge leads naturally to the affirmation of the Divine Unity. Although the spiritual realities are not merely rational, neither are they irrational. Reason, considered in its ultimate rather than its immediate aspect, can bring man to the gateway of the intelligible world; rational knowledge can in the same fashion be integrated into gnosis, even though it is discursive and partial while gnosis is total and intuitive. It is because of this essential relationship of subordination and hierarchy between reason and intellect, rational knowledge and gnosis, that the quest for causal explanation in Islam only rarely sought to, and never actually

managed to, satisfy itself *outside the faith,* as was to happen in Christianity at the end of the Middle Ages.

This hierarchy is also based on the belief that *scientia*—human knowledge—is to be regarded as legitimate and noble only so long as it is subordinated to *sapientia*—Divine wisdom. Muslim sages would agree with Saint Bonaventure's "Believe, in order to understand." Like him, they insist that *scientia* can truly exist only in conjunction with *sapientia,* and that reason is a noble faculty only insofar as it leads to intellection, rather than when it seeks to establish its independence of its own principle, or tries to encompass the Infinite within some finite system. There are in Islamic history one or two instances when rationalist groups did attempt to establish their independence of and opposition to the gnostics, and also to set themselves against other orthodox interpreters of the Islamic revelation. The spiritual forces of Islam were always strong enough, however, to preserve the hierarchy between intellect and reason, and thus to prevent the establishment of a rationalism independent of the revelation. The famous treatises of al-Ghazzālī, in the fifth/eleventh century, against the rationalistic philosophers of his time mark the final triumph of intellection over independent ratiocination—a triumph that did not utterly destroy rationalistic philosophy, but did make it subordinate to gnosis. As a result of this defeat by al-Ghazzālī and similar figures of the syllogistic and systematic Aristotelian philosophy in the fifth/eleventh century, the Islamic gnostic tradition has been able to survive and to remain vital down to the present day, instead of being stifled, as elsewhere, in an overly rationalistic atmosphere.

The reaction against the rationalists, of which the writings of al-Ghazzālī mark the high point, coincides roughly in time with the spread of Aristotelianism in the West, which led ultimately to a series of actions and reactions—the Renaissance, the Reformation, and the Counter-Reformation—such as never occurred in the Islamic world. In the West, these movements led to new types of philosophy and science such as characterize the Western world today, that are as profoundly different from their medieval antecedents as is the mental and spiritual horizon of modern man from that of traditional man. Europe in that period began to develop a science of Nature that concerns itself only with the quantitative and material aspects of things; meanwhile, the tide of Islamic thought was flowing back, as before, into its traditional bed, to that conceptual coherence that comprises the mathematical sciences.

Today, as in the past, the traditional Muslim looks upon all of science as "sacred," and studies this sacred science in a well-established threefold articulation. First, within the reach of all, is the Law, contained in essence in the Quran, elucidated by tradition and jurisprudence, and taught by the doctors; it covers every aspect of the social and religious life of the believer. Beyond that lies the Path dealing with the inner aspect of things, which governs the spiritual life of those who have been "elected" to follow it. This has given rise to the various Sufi brotherhoods, since it is actually a way of life, built upon communication at a personal, nonsystematic level. Finally, there is the ineffable Truth itself, which lies at the heart of both these approaches.

According to a still-current simile, the Law is as the circumference of a circle, of which the Path is the radius, and the Truth the center. The Path and the Truth together form the esoteric aspect of Islam, to which Sufism is dedicated. At its core lies a metaphysical intuition, knowledge such as comes only to the right "mode in the knower." From this spring a science of the universe, a science of the soul, and the science of mathematics, each of them in essence a different metaphorical setting for that one science that the mind strives after, each of them a part of that gnosis that comprehends all things.

This may help explain why the mathematician, who was something of a displaced person in the West right up to the late Middle Ages, plays a central role in Islam from the very start. Two centuries after the establishment in the Near East of Christianity (in A.D. 313), the Christian-dominated West was still sunk deep in barbarism. Yet two centuries after Muḥammad, the Islamic world under the Caliph Hārūn al-Rashīd was already far more active culturally than the contemporaneous world of Charlemagne—even with the latter's earlier start. What reached the West from Islam at that time was little more than dark tales of incredible wealth and wondrous magic. In Islam itself, however, the mathematician's craft, having "found its home," was already able to satisfy the civilized man's desire for logical subtlety and for intellectual games, while philosophy itself reached out into the mysteries beyond reason.

This early stabilization of the theoretical outlook of Islam extended also to the type of man who embodied it. Whereas the role of intellectual leadership in the West devolved upon several different figures in turn—the Benedictine monk, the scholastic doctor, the lay scientist—the central figure in Islam

has remained almost unchanging. He is the *hakīm*, who encompasses within himself some or all of the several aspects of the sage; scholar, medical healer, spiritual guide. If he happens to be a wise merchant too, that also falls into the picture, for he is traditionally an itinerant person. If his achievements in mathematics are extraordinary, he may become a figure like ʿUmar Khayyām. It is clear, moreover, that such a man—be his name even Avicenna!—will never be able to develop each of his several attainments in the same fashion as the single-faceted specialist may. Such specialists do exist in Islam, but they remain mostly secondary figures. The sage does not let himself be drawn into the specialist's single-level "mode of knowing," for then he would forfeit the higher knowledge. Intellectual achievement is thus, in a sense, always patterned upon the model of the unattainable complete, that "total thing" that is not found in the Greek tradition. Ptolemy's *Syntaxis* becomes in the Muslim world the *Almagest* or *Opus Maximum*—even as Aristotle is purely and simply *al-failasūf* (the philosopher).

The title of Avicenna's great treatise, *Kitāb al-Shifāʾ*, which rivals in scope the Aristotelian corpus, means *The Book of Healing*. As the title implies the work contains the knowledge needed to cure the soul of the disease of ignorance. It is all that is needed for man to understand; it is also *as much as* any man need know. Newton's work *Principia* has an obviously far different ring: it means a foundation—essentially, a "beginning"—rather than a knowledge that is complete and sufficient for man's intellectual needs as the titles of so many medieval Islamic texts imply.

## *B. The Perspectives within Islamic Civilization*

Islam came into the world at the beginning of the seventh century A.D., its initial date (the journey of the Prophet from Mecca to Medina) being 622 A.D.; it had spread over all of

the Middle East, North Africa, and Spain, by the end of that same century. Just as the Islamic religion is one of the "middle way," so too did its territory come to occupy—in fact, it still occupies—the "middle belt" of the globe, from the Atlantic to the Pacific. In this region, the home of many earlier civilizations, Islam came into contact with a number of sciences which it absorbed, to the extent that these sciences were compatible with its own spirit and were able to provide nourishment for its own characteristic cultural life.

The primordial character of its revelation, and its confidence that it was expressing the Truth at the heart of all revelations, permitted Islam to absorb ideas from many sources, historically alien yet inwardly related to it. This was especially true in regard to the sciences of Nature, because most of the ancient cosmological sciences—Greek, as well as Chaldean, Persian, Indian, and Chinese—had sought to express the unity of Nature and were therefore in conformity with the spirit of Islam. Coming into contact with them, the Muslims adopted some elements from each—most extensively, perhaps, from the Greeks, but also from the Chaldeans, Indians, Persians, and perhaps, in the case of alchemy, even from the Chinese. They united these sciences into a new corpus, which was to grow over the centuries and become part of the Islamic civilization, integrated into the basic structure derived from the Revelation itself.

The lands destined to become parts of the medieval Islamic world—from Transoxiana to Andalusia—were consolidated into a new spiritual universe within a single century after the death of the Prophet. The revelation contained in the Quran, and expressed in the sacred language (Arabic), provided the unifying pattern into which many foreign elements became integrated and absorbed, in accordance with the universal spirit of Islam. In the sciences, especially those dealing with Nature, the most important source was the heritage of Greek civilization.

Alexandria, by the first century B.C., had become the center of Greek science and philosophy, as well as the meeting place of Hellenism with Oriental and ancient Egyptian influences, out of which came Hermeticism and Neoplatonism. The Greek heritage—itself to a great extent an assemblage of ancient Mediterranean views, systematized and put into dialectical form by the peculiar discursive power of the Greeks—passed from Alexandria to Antioch, and from there to Nisibis and Edessa, by way of the Christian Monophysites and Nestorians. The latter were particularly instrumental in the

spreading of Greek learning, chiefly in Syriac translation, to lands as far east as Persia.

In the third century A.D., Shāpūr I founded Jundishapur at the site of an ancient city near the present Persian city of Ahwaz, as a prisoner-of-war camp, for soldiers captured in the war with Valerian. This camp gradually grew into a metropolis, which became a center of ancient sciences, studied in Greek and Sanskrit and later in Syriac. A school was set up, on the model of those at Alexandria and Antioch, in which medicine, mathematics, astronomy, and logic were taught, mostly from Greek texts translated into Syriac, but also elements of the Indian and Persian sciences were included. This school, which lasted long after the establishment of the Abbasid caliphate, became an important source of ancient learning in the Islamic world.

Aside from those more obvious avenues, there were also lines of communication with more esoteric aspects of the Greek sciences, particularly the Pythagorean school, through the community of Sabaeans of Harran. This religious community traced its origin to the Prophet Idrīs (the Enoch of the Old Testament), who is also regarded in the Islamic world as the founder of the sciences of the heavens and of philosophy, and who is identified by some with Hermes Trismegistus. The Sabaeans possessed a remarkable knowledge of astronomy, astrology, and mathematics; their doctrines were in many respects similar to those of the Pythagoreans. It was probably they who provided the link between the Hermetic Tradition and certain aspects of the Islamic esoteric doctrines, into which some elements of Hermeticism were integrated.

On the Oriental side the Indian and, to a lesser degree, the Persian sciences came to have an important bearing upon the growth of the sciences in Islam, a bearing far greater than is usually recognized. In zoology, anthropology, and certain aspects of alchemy, as well as, of course, in mathematics and astronomy, the tradition of Indian and Persian sciences was dominant, as can be seen in the *Epistles (Rasā'il)* of the Brethren of Purity (*Ikhwān al-Ṣafā'*) and the translations of Ibn Muqaffa'. It must be remembered that the words "magic" and Magi are related, and that, according to the legend, the Jews learned alchemy and the science of numbers from the Magi, while in captivity in Babylon.

There are most likely elements of Chinese science in Islam, especially in alchemy, pointing to some early contact between the Muslims and Chinese science. Some have even gone so far as to claim—without much proof, to be sure—

that the word *al-kīmiyā'* from which "alchemy" is derived, is itself an arabization of the classical Chinese word *Chin-I*, which in some dialects is *Kim-Ia* and means "the gold-making juice." The most important influence from China, however, was to come in later centuries, particularly after the Mongol invasion, and then primarily in the arts and technology.

The totality of the arts and sciences in Islam thus consisted of a synthesis of the ancient sciences of the Mediterranean people, as incorporated and developed by the Greeks, along with certain Oriental elements. The dominant part of this heritage was definitely Graeco-Hellenistic, in translations either from Syriac or from the Greek itself, by such masters of translation as Ḥunain ibn Isḥāq, and Thābit ibn Qurrah. There were numerous translations of Greek authors into Arabic in nearly every domain of knowledge. The ideas and points of views contained in these translations formed a large part of the nutriment which Islam sampled and then assimilated according to its own inner constitution, and the foundation given to it by the Quranic revelation. In this way there developed, in conjunction with the three basic "dimensions" of the Law, the Path, and the Truth, Islamic schools which were to become an accepted part of Islamic civilization.

With respect to Greek learning itself, Muslims came to distinguish between two different schools, each possessing a distinct type of science: one, the Hermetic-Pythagorean school, was metaphysical in its approach, its sciences of Nature depending upon the symbolic interpretation of phenomena and of mathematics; in the other, the syllogistic-rationalistic school of the followers of Aristotle, the point of view was philosophical rather than metaphysical, and its sciences were therefore aimed at finding the place of things in a rational system, rather than at seeing, through their appearances, their heavenly essences. The first school was regarded as the continuation, in Greek civilization, of the wisdom of the ancient prophets, especially Solomon and Idrīs; it was therefore considered to be based on divine rather than human knowledge. The second school was looked upon, for the most part, as reflecting the best effort the human mind could make to arrive at the truth, an effort of necessity limited by the finite nature of human reason. The first school was to become an integral part of Islam, certain of its cosmological sciences being integrated into some of the branches of Sufism. The second school did have many disciples in the earlier centuries and thus left an influence upon the language of Muslim theology; after the seventh/thirteenth century, it lost ground, however,

and, despite its continuation up to the present day, it has remained a secondary aspect of Islamic intellectual life.

The various levels of reference existing hierarchically within the structure of Islam are presented concisely by a sage who lived in the fifth/eleventh century, and who is probably the one Oriental figure most familiar to the modern Western public: ʿUmar Khayyām, mathematician and poet extraordinary. That he should be regarded in the Western world, on the strength of his famous quatrains, as a skeptical hedonist is itself a sign of the profound lack of understanding between the two worlds; for he was in reality a sage and a gnostic of high standing. What appears to be lack of concern or agnosticism in his poetry is merely an accepted form of expression, within which he incorporated both the drastic remedy that the gnostic applies to religious hypocrisy, and also the reestablishment of contact with reality. (Late Greeks, such as Aenesidemus, had had recourse to the same skeptical device, and with similar intentions.) In the following passage from a metaphysical treatise, Khayyām divides the seekers after knowledge into four categories:

(1) The theologians, who become content with disputation and "satisfying" proofs, and consider this much knowledge of the Creator (excellent is His Name) as sufficient.
(2) The philosophers and learned men [of Greek inspiration] who use rational arguments and seek to know the laws of logic, and are never content merely with "satisfying" arguments. But they too cannot remain faithful to the conditions of logic, and become helpless with it.
(3) The Ismailis [a branch of Shia Islam] and others who say that the way of knowledge is none other than receiving information from a learned and credible informant; for, in reasoning about the knowledge of the Creator, His Essence and Attributes, there is much difficulty; the reasoning power of the opponents and the intelligent [of those who struggle against the final authority of the revelation, and of those who fully accept it] is stupefied and helpless before it. Therefore, they say, it is better to seek knowledge from the words of a sincere person.
(4) The Sufis, who do not seek knowledge by meditation or discursive thinking, but by purgation of their inner being and the purifying of their dispositions. They cleanse the rational soul of the impurities of nature and bodily form, until it becomes pure substance. It then comes face to face with the spiritual world, so that the forms of that world become truly reflected in it, without doubt or ambiguity.

> This is the best of all ways, because none of the perfections of God are kept away from it, and there are no obstacles or veils put before it. Therefore, whatever [ignorance] comes to man is due to the impurity of his nature; if the veil be lifted and the screen and obstacle removed, the truth of things as they are will become manifest. And the Master [the Prophet Muḥammad]—upon whom be peace—indicated this when he said: "Truly, during the days of your existence, inspirations come from God. Do you not want to follow them?"
>
> Tell unto reasoners that, for the lovers of God [gnostics], intuition is guide, not discursive thought.[2]

Here we have, stated authoritatively, the central perspective of Islamic thought, in which the component parts fall naturally into place. Each one is a different mode of knowing. It is puzzling at first sight to find nowhere in it the mathematicians, of whom Khayyām himself was such an eminent example. Notice, however, that the Ismailis correspond quite closely with what in the early Pythagorean school had been the *Akusmatikoi*, "those who go by what is told them." It should be noticed, also, that the Pythagorean *Mathematikoi*, the "expounders of the doctrine," will be found both among the philosophers and again among the Sufis, since systematic theory remains helpless without spiritual achievement, which is precisely what mathematics is intended to lead to, by contrast with syllogistic hair-splitting. This is clearly revealed in later sections of the same work in which Khayyām describes himself as both an orthodox Pythagorean and a Sufi.

Here, too, we see the significant contrast with the Greek world. For the Pythagorean doctrines alluded to had become practically extinct there by the time of Aristotle, and were to be taken up again, and at that only after a fashion, in the Hellenistic revival; in Islam, we see them stabilized and restored almost according to their original pattern through the unitary religious idea. Islam was thus able to hand on to the West, to the extent that the latter accepted the Pythagorean tradition, something more coherent, as well as technically more advanced, than the West's own immediate heritage from antiquity.

There are other lines to be found in Khayyām's spectrum.

2 ʿUmar Khayyām. *Risālah-i wujūd* (Bayāḍī MS. in the Tehran National Library). Translated by S. H. Nasr.

The "atomistic" school of thought which flourished in Islam after the fourth/tenth century, and which in the Western perspective might be supposed to be scientific, he regards as not belonging to science at all, but to theology, for the Ashʿarites who represented this school were exactly the sort of "theologians" he described. In the writings of the followers of this school—especially al-Bāqillānī, who may be considered their outstanding "philosopher of Nature"—the continuity of external forms is broken by an "atomistic" doctrine of time and space, and by the denial of the Aristotelian notion of causality. For the Ashʿarites (as also for the Sufis), the world is annihilated and recreated at every moment; the cause of all events is the Creator and not a finite, created agent. A stone falls because God makes it fall, not because of the nature of the stone or because it is impelled by an external force. What appears as "Laws of Nature," i.e., the uniformity of sequence of cause and effect, is only a matter of habit, determined by the will of God and given the status of "law" by Him. Miracles, which seem to break the apparent uniformity of natural phenomena, are simply going against the "habit" of Nature; the Arabic word for a supernatural event means literally that which results from "rupture of habit." We are facing here a strict "consequentiality," which has its parallel in Western thought of the seventeenth century. From Descartes to the Occasionalists, the development presents curious similarities.

In the second grouping on Khayyām's list, the "philosophers and learned men," we would find assembled all the famous names of Islamic science. There is a sharp distinction, however, between two schools of "philosophical" thought, both of which profess to be disciples of the Greeks. The first is the Peripatetic school, whose doctrines are a combination of the ideas of Aristotle and of some Neoplatonists. The representative of this school who was closest to Aristotle was Averroes who, paradoxically, had less effect upon the Islamic than upon the Christian world, and should be studied more as a great member of the tradition of Western philosophy than as an integral part of Islamic intellectual life.

The science of Nature cultivated by the Peripatetic school is primarily syllogistic: it seeks to determine the place of each being, in a vast system based upon the philosophy of Aristotle. The best expression of the doctrines of this school appears in Avicenna's early writings. *The Book of Healing* is the most comprehensive encyclopedia of knowledge ever

written by one person, and undoubtedly the most influential Peripatetic work in Islam.

The other Islamic school professing to follow the Greeks was much more sympathetic to the Pythagorean-Platonic than to the Aristotelian tradition. This school, which in later centuries came to be called the Illuminatist (*ishrāqī*) school, asserts that it derives its doctrines not only from the Pythagoreans and their followers, but from the ancient Prophets, the Hermetic Tradition, and even from the ancient Zoroastrian sages. The symbolic works of Avicenna, such as *Living Son of the Awake* (*Ḥayy ibn Yaqẓān*) are early expressions of the writings of this school. The greatest Illuminatist philosopher, however, is Suhrawardī, who drew his symbolism from all the many sources mentioned above.

The sciences of Nature, as well as the mathematics cultivated by certain adherents of this school, are primarily symbolic, and resemble to a great extent the writings of some Neoplatonists. Nature becomes for the writers of this school a cosmic crypt from whose confines they must seek to escape; and on their journey through it, they see in its phenomena "signs," which guide them on the road toward final "illumination." Many Illuminatists, particularly those of later centuries, have also been Sufis, who have made use of the eminently initiatic language of the Illuminatist philosophers to describe the journey of the Sufi toward gnosis. Many members of this school, and in general the learned men whom Khayyām mentions, have also been among the group that have cultivated mathematics, astronomy, and medicine; for these learned men took an interest in all the arts and sciences, and helped to keep alive the traditions of learning in those fields, as an integral part of their studies in philosophy.

The Peripatetics were very strong during the fourth/tenth and fifth/eleventh centuries, but their influence weakened during the succeeding period. The Illuminatists, on the other hand, became strong after the sixth/twelfth century and al-Ghazzālī's triumph. They have had a continuous tradition down to the present day, chiefly because of the metaphysical (as against rationalistic) emphasis in their doctrines, and also because of the use of their language by certain Sufi masters. One of the greatest exponents of Illuminatist doctrines, as interpreted and modified by the Safavid sage Mullā Ṣadrā, was Ḥājjī Mullā Hādī Sabziwārī who died in Persia less than a century ago.

The Ismailis, to whom Khayyām next refers, are a branch of Shia Islam, which was very powerful in his time, and also

played a considerable role in the cultivation of the arts and sciences. Ismaili doctrines are fundamentally esoteric, being based on numerical symbolism and the symbolic interpretation of the "cosmic text." The symbolic interpretation of the Quran, which is basic in Shia Islam as well as in Sufism, was made the basis for the symbolic study of Nature. Moreover, such sciences as alchemy and astrology became integrated into their doctrines, and such texts as the *Epistles* of the Brethren of Purity, and the numerous writings of Jābir ibn Ḥayyān, the alchemist, were to have their greatest influence upon this group. The development of what has been called "Oriental neo-Pythagoreanism" is found most clearly in the treatises of the Ismailis. They were very much interested in the sciences of Nature; in integrating the rhythms and cycles of Nature with the cycles of history and with the manifestations of various prophets and imams, their works rank among the most important Islamic writings on Nature.

Khayyām mentions, finally, the Sufis or gnostics, the group to which he himself belonged. It may seem surprising that a man so well versed in the arts and sciences of his day should consider the "way of purification" of the Sufis as the best way of acquiring knowledge. His language in this regard, however, is not merely theoretical, it is almost operational: one cleanses and focuses the instrument of perception, i.e., the soul, so that it may see the realities of the spiritual world. Aristotle himself, the great rationalist, had once said that "knowledge is according to the mode of the knower." The gnostic, in employing the "right" mode of knowledge ensures that Intellection takes place in him immediately and intuitively. In this regard, Khayyām's statement becomes clearer when seen in the light of a doctrine that we shall discuss later: the doctrine of the universal man, who is not only the final goal of the spiritual life, but also the archetype of the universe.

To the extent that the gnostic is able to purify himself of his individualistic and particular nature, and thus to identify himself with the universal man within him, to that same extent does he also gain knowledge of the principles of the cosmos, as well as of the Divine realities. For the gnostic, knowledge of Nature is secondary to knowledge of the Divine Principle; yet, because of the rapport between the gnostic and the universe, Nature does play a positive role in guiding him to his ultimate goal. The phenomena of Nature become "transparent" for the gnostic, so that in each event he "sees" the archetype. The symbols of substances—geometric forms

and numerical quantities, colors, and directions—these and many other such symbols are aspects of the being of things. They increase in their reality—a reality independent of personal taste or of the individual—to the extent that the gnostic divorces himself from his individual perspective and limited existence, and identifies himself with Being. For the gnostic, the knowledge of anything in the universe means ultimately knowledge of the relationship between the essence of that particular being and the Divine Intellect, and the knowledge of the ontological relationship between that being and Being itself.

Khayyām's classification did not take into consideration certain writers of great importance, who did not follow any particular school. There are also many Islamic writers, hakims, including Khayyām himself, who possessed a knowledge of several disciplines, and in whom two or more levels of his hierarchy of knowledge may be found. Some of the most outstanding of these men will be discussed in the next chapter.

Inasmuch as the hierarchy of knowledge in Islam, as it has existed historically, has been united by a metaphysical bond—much as a vertical axis unites horizontal planes of reference—the integration of these diverse views "from above" has been possible. Historically, of course, there have been many conflicts, sometimes disputes leading to violence and occasionally to the death of a writer. Such conflicts are not, however, as elsewhere, between incompatible orthodoxies. They are regarded by most Islamic commentators as due to the lack of a more universal point of view on the part of those who have only embraced a less universal one. Only the gnostic, who sees all things "as they really are," is able to integrate all these views into their principial unity.

Regarded from their own point of view, each of these schools may be said to possess a certain "philosophy of Nature," and, in conformity with it, to cultivate the sciences dealing with the universe. Some of their writings, primarily those of the Peripatetics, were to be translated into Latin to help form that Western scholasticism which was later to give way to seventeenth-century "natural philosophy." Other writings, such as those of the alchemists, were to flourish in the Western world for several centuries, only to wither away in its atmosphere of rationalistic philosophy. There were still other works, especially those of the Sufis and Illuminatists, which were to have an influence on certain Western circles such as that of Dante, and yet for the most part to remain

almost unknown in the Western world, down to comparatively recent times.

In this brief introduction, it has been necessary to cover much ground that is unfamiliar and often quite difficult for a Western reader to grasp. But we felt that we had to dispel the common conception of the Muslims as merely Puritan warriors and merchants, whose strange bent for the "subtleties" of algebra and logic somehow also enabled them to become the transmitters of Greek learning to the West. As against that all too current notion, we have tried to present a brief picture of a culture whose spiritual values are inextricably tied up with mathematics and with metaphysics of a high order, and which once again fused the constituent elements of Greek science into a powerful unitary conception, which had an essential influence on the Western world up to the time of the Renaissance.

Strangely enough, it is this latter conception, half unknown at best, and then quickly forgotten in the West, which has remained, up to the present Western impact upon the Islamic world, the *major* factor in the Islamic perspective determining its attitude toward Nature and the meaning it gives to the sciences of Nature; conversely, it is those very elements of the Islamic sciences, most responsible for providing the tools with which the West began the study of the already secularized Nature of the seventeenth century, that became *secondary* in the Islamic world itself and had already ceased to occupy the main intellectual efforts of that civilization by the ninth/fifteenth century.

The Western world has since concentrated its intellectual energies upon the study of the quantitative aspects of things, thus developing a science of Nature, whose all too obvious fruits in the physical domain have won for it the greatest esteem among people everywhere, for most of whom "science" is identified with technology and its applications. Islamic science, by contrast, seeks ultimately to attain such knowledge as will contribute toward the spiritual perfection and deliverance of anyone capable of studying it; thus its fruits are inward and hidden, its values more difficult to discern. To understand it requires placing oneself within its perspective, and accepting as legitimate a science of Nature which has a different end, and uses different means, from those of modern science. If it is unjust to identify Western science solely with its material results, it is even more unjust to judge medieval science by its outward "usefulness" alone. However important its uses may have been in calendarial

work, in irrigation, in architecture, its ultimate aim has always been to relate the corporeal world to its basic spiritual principle, through the knowledge of those symbols which unite the various orders of reality. It can only be understood, and should only be judged, in terms of its own aims and its own perspectives.

CHAPTER ONE

# *THE UNIVERSAL FIGURES OF ISLAMIC SCIENCE*

THROUGHOUT ISLAMIC HISTORY, the central figure in the transmission of the sciences has been the wise man, or *ḥakīm*. He has usually been a physician, a writer and poet, an astronomer and mathematician, and, above all, a sage. In this figure of the *ḥakīm*, one can see the unity of the sciences as so many branches of a tree whose trunk is the wisdom embodied in the sage. The *ḥakīm* has always established the unity of the sciences in the minds of students, by the very fact of his teaching all of the sciences as so many different applications of the same fundamental principles. The Islamic teaching system as a whole and the classification of the sciences, which forms its matrix, are themselves dependent upon this figure of the *ḥakīm*, or sage.

Of course, not all of those who have made notable contributions to Islamic science have been masters of every field of knowledge. Some have been predominantly mathematicians, or physicians, or natural historians. With such figures we shall deal in the appropriate chapters pertaining to each subject matter. But there are a number of outstanding figures whose scope was universal, and they played an important role in several of the sciences. Today knowledge has become so compartmentalized as to make the conception of such figures very difficult for modern man. Furthermore, in dividing the Islamic sciences into subjects that

conform more or less to the present-day division of knowledge, it becomes difficult to determine where to place such figures. We have therefore decided to describe briefly some of the outstanding universal figures of Islamic science in this chapter, leaving others whose contribution, no matter how important, belongs to a particular domain to be treated along with the subject matter in question. These universal figures are by no means the only ones to have made noteworthy achievements, especially in mathematics, but they are the hakims whose names appear in nearly every field of Islamic science and who have left an indelible mark upon the intellectual life of Islam.

### *Jābir ibn Ḥayyān (c.103/721–c.200/815)*

Little is known of the life of Jābir ibn Hayyān al-Azdī al-Tūsī al-Sūfī, the founder of Islamic alchemy. It can be asserted with some certainty that his family came from the Azd tribe of Southern Arabia that had settled during the rise of Islam in Kufa. His father, a Shiite, had plotted against the Omayyads in Khurasan where Jābir was born, probably in Tus. He spent his early years there and then was sent to Arabia. Later he came to Kufa where he spent much of his life and, finally, to Baghdad where he first became known as an alchemist at the court of Hārūn al-Rashīd and was especially associated with the viziers of the Abbasids, the powerful Barmakids. He was a Sufi and a Shiite, closely connected with the circle of the sixth Imam, Jaʿfar al-Ṣādiq. With the disgrace of the Barmakids at court, Jābir also fell out of favor but is said to have survived into the reign of al-Maʾmūn, although the date of his death is by no means certain.

The number of writings that bear Jābir's name, about three thousand, most of which are short treatises, have made many doubt their authenticity and some have even questioned the historical existence of Jābir. But as E. Holmyard, a leading historian of Islamic alchemy, has clearly shown there is no doubt about the existence of such a person. The Shiite historical sources are too consistent about Jābir to enable one to deny that such a figure existed. Yet, there is no doubt that many works in the Jābirian corpus are later Ismaili accretions and in fact Jābir became, more than an historical figure, an intellectual type in whose name many

later works were written. There is little reason to doubt, however, that much of the corpus does belong to Jābir and the rest to the school connected with his name.

The question of Jābir is further complicated by the fact that under his Latin name, Geber, there appeared a series of works in Latin for which there is no Arabic original while other works by "Geber" are really Latin versions of treatises belonging to the Jābirian corpus. There is, therefore, a distinction to be made between the Latin Geber and Jābir although until all of the Jābirian corpus, most of which remains unedited, is studied there is no means of determining how much of the Latin Geber belongs to a Western, most likely a Spanish, alchemist writing under the name of the outstanding master of the art of alchemy.

The important works of Jābir include *The Hundred and Twelve Books*, some of which are dedicated to the Barmakids; *The Seventy Books*, a good portion of which was translated into Latin, and *The Books of the Balance*, which outline the famous theory of the balance underlying the whole of Jābirian alchemy. Jābir did not only write on alchemy, of which he was the greatest medieval authority, but also on logic, philosophy, medicine, the occult sciences, physics, mechanics and nearly every other domain of knowledge. He expounded a particular "philosophy of nature" and a method for the study of different sciences that influenced all later alchemical and Hermetic authors as well as the Ismailis and certain schools of Imāmī, or "Twelver," Shiism and Sufism.

### *Abū Yūsuf Yaʿqūb ibn Isḥāq al-Kindī (c. 185/801–c.260/873)*

Al-Kindī, the Latin Alkindus, who is entitled the "Philosopher of the Arabs," came from the Arab tribe of Kindah. His ancestors had settled in Kufa where his father was governor. Al-Kindī spent his early life in Kufa, which had become a center of the sciences. He studied the religious sciences as well as philosophy and mathematics, and became especially interested in the philosophical sciences after going to Baghdad. At this time the major movement of translation into Arabic had already begun. He knew Syriac and perhaps some Greek and was well acquainted with Graeco-Hellenistic scientific and philosophical works. For some time he was held in high esteem in court but spent the last part of his life in obscurity.

Al-Kindī was the first of the Muslim philosopher-scientists.

His interest was encyclopedic. He wrote about two hundred seventy treatises, most of which are now lost, in logic, philosophy, physics, all branches of mathematics as well as music, medicine and natural history. He was the founder of the Islamic Peripatetic school of philosophy and was highly respected in the medieval and Renaissance West to the extent that he was considered as one of the judices of astrology and Cardano called him one of the twelve great intellectual figures of humanity. His immediate students were well-known geographers and mathematicians, while his philosophic influence is to be seen directly in the writings of al-Fārābī and later Muslim Peripatetics.

### *Ḥunain ibn Isḥāq (194/810–263/877)*

Ḥunain, the Latin Joannitius, was one of the Christian scholars who made an important contribution to the rise of Islamic sciences as translators and transmitters of the Greek sciences. He was born in Hira, his father having been an apothecary. He studied in Jundishapur and Baghdad under the well-known physician Ibn Māsawaih (Mesue Senior), and journeyed to Anatolia to complete his knowledge of Greek. He and his immediate students, including his son and nephew, made the most exact and correct translations of Greek and Syriac texts into Arabic and played a major role in the sudden rise of interest by Muslims in the Graeco-Hellenistic sciences. Ḥunain himself was an outstanding physician whose works were cited as authority by later Muslim authors. He also wrote on astronomy, meteorolgy and especially philosophy. His *Aphorism of Philosophers* was well known in the West in its Hebrew version and he is especially noted for his study and translation of the philosophy of Galen.

### *Thābit ibn Qurrah (211/826 or 221/836–288/901)*

Thābit hailed from the community of Sabaens in Harran, where there was a religious cult centered around the symbolism of the planets. This cult, much interested in the Pythagorean mathematical and mystical tradition, survived well into the Islamic period. Like many members of this community Thābit was well versed in mathematics and astronomy. Due to religious differences with his community he set out for Bagh-

dad and was fortunate in meeting on the way the influential mathematician, Muḥammad ibn Mūsā ibn Shākir, who, recognizing his ability, took him under his patronage. Thābit soon gained fame in Baghdad and became the court astronomer. Thābit was a major translator, almost as important as Ḥunain, and, like him, he wrote lasting works in medicine and philosophy. In addition he wrote many treatises on astronomy, number theory, physics and other branches of mathematics that exercised an immense influence on Muslim scientists. The echo of his scientific views, especially regarding the theory of "trepidation," was heard throughout the Middle Ages in the West.

*Muhammad ibn Mūsā al-Khwārazmī (d. c.249/863)*

Al-Khwārazmī, the first outstanding Muslim mathematician with whom the history of this subject among Muslims properly begins, was born in Khwarazm (usually written as Khwarizm in most European sources), the modern Khiva. Little is known of his life except that he spent some time in Baghdad and it is said by some later historians that he journeyed to India to master the Indian sciences. He became a well-known scientist at the court of al-Maʾmūn and participated in measuring the degree of arc in the company of astronomers commissioned by al-Maʾmūn for this task.

The writings of al-Khwārazmī, which represent his own works as well as the synthesis of the mathematical works of the generation before him, had an immense influence, more than that of any other single mathematician. His *Algebra* (*al-Jabr waʾl-muqābalah*), the first Muslim work on Algebra, gave its name to this science in both East and West. He introduced the Indian numerals into the Muslim world and through his work on arithmetic, the West came to know of the numerals which it calls "Arabic." He wrote the first extensive Muslim work on geography revising much of Ptolemy and drawing new geographical and celestial maps. His astronomical tables are among the best in Islamic astronomy. His influence is attested to by the fact that Algorism, the latinization of his name, al-Khwārazmī, for a long time meant arithmetic in most European languages and is used today for any recurring method of calculation which has become an established rule. It has even entered into the technical vocabulary of modern computation techniques.

*Muḥammad ibn Zakarīyā al-Rāzī (c.251/865–313/925)*

Al-Rāzī, the Latin Rhazes, sometimes called "the Arabic Galen," is the greatest clinical physician of Islam, well known in both the West and the East. His authority in medicine has been second only to that of Avicenna whom he excelled in his observational powers. Rhazes, as his name bears out, was born in Rai where he spent the first part of his life. He is said to have been a lute player who, at the age of thirty, turned from music to alchemy. Then, as a result of the weakening of his eyesight, relatively late in life, he devoted his whole attention to medicine in which he seems to have been interested even in his earlier years. He studied medicine and perhaps philosophy with ʿAlī ibn Rabban al-Ṭabarī. Soon he became the director of the hospital at Rai and later functioned in the same capacity in Baghdad. Students flocked to him from near and far, and he was respected both for his knowledge and kindness toward students and patients. He wrote and studied continuously until he went blind whereupon he returned to Rai to pass the rest of his days.

Al-Bīrūnī, who made a special study of the writings of Rhazes, mentions one hundred eighty-four works. Most of these are lost, especially the philosophical ones of which only a few survive. Of the medical works the most important one is *Continens* (*al-Ḥāwī*) so well known in the Latin Occident. It is the longest single Islamic work on medicine and contains many of Rhazes' own observations. His masterpiece *The Treatise on Smallpox and Measles* (known in Latin as *De Pestilentia* or *De Peste*) was read in medical circles in the West until the modern period. His alchemical works, especially the *Secret of Secrets*, have been also well known. His philosophical and ethical works, however, were never known to the West and in the East met with severe criticism from both the theologians and Peripatetic philosophers because of their "anti-prophetic" sentiment. His influence in the Islamic world as well as in the West has been primarily in the fields of medicine and alchemy. In both of these fields he was recognized as one of the indubitable masters.

*Abū Naṣr al-Fārābī (c.258/870–339/950)*

Al-Fārābī, the Latin Alpharabius, the second outstanding Peripatetic philosopher after al-Kindī, was born in Farab in Transoxiana where he spent the first half of his life. His

father was a general and afforded him the opportunity to study with the best teachers. His early training was in religious sciences and languages in which he was very proficient. Later historians record his having known nearly every language. This means that most likely he knew many; certainly Arabic, Persian and Turkish, and probably some of the Central Asiatic dialects and local languages. Later in life he became interested in philosophy and the sciences but, unlike many similar figures in Islamic history, not in medicine. He set out for Baghdad, then the center of learning, where he studied logic with the Christian Abū Bishr Matta ibn Yūnus, the undisputed master in the field. Later he became himself the greatest authority in logic and trained such famous logicians and philosophers as the Christian philosopher Yaḥyā ibn ʿAdī. After twenty years in Baghdad, al-Fārābī set out for the court of Saif al-Daulah in Aleppo where he spent the rest of his days and where he died much respected and honored.

Al-Fārābī was the first person in Islam to classify completely the sciences, to delineate the limit of each, and to establish firmly the foundation of each branch of learning. He was for this reason called the "Second Teacher," the first having been Aristotle who accomplished this same task in ancient times and set the precedent for the Muslim philosophers. Al-Fārābī is also the first great Muslim commentator on Aristotle. Of the seventy works of al-Fārābī cited, half are devoted to logic, of which he was the real founder in Islam, including the commentary or paraphrasing of the whole of the *Organon* of Aristotle. His commentary on the *Metaphysics* helped Avicenna understand that work. He wrote independent works on physics, mathematics, ethics and political philosophy of which he was again the founder in Islam. He was a practicing Sufi and the spirit of Sufism runs throughout his works. He was also one of the foremost medieval theoreticians of music and some of his musical works have survived in the rites of Sufi brotherhoods, especially those in Anatolia, until modern times.

### *Abu'l-Ḥasan al-Masʿūdī (d. 345/956)*

One of the outstanding historians and scientists of Islam, al-Masʿūdī was born near Baghdad. He was a world traveler, having journeyed through Persia, Central Asia, India, and the Near East and, according to traditional accounts, having

sailed through the China Sea and to Madagascar. The last ten years of his life were spent first in Syria and then in Egypt where he died.

Al-Masʿūdī belongs to the tradition of universal historians like al-Ṭabarī and al-Yaʿqūbī. His *Meadows of Gold and Mines of Precious Stones* is a notable work of its kind. It shows al-Masʿūdī as historian, geographer, geologist, and natural historian. Its pages contain many valuable scientific observations. Late in life al-Masʿūdī composed his *Book of Indication and Revision* which summarizes his philosophy of Nature and is the synthesis of his observations on Nature and history. Al-Masʿūdī also wrote works on philosophical and theological questions but it is upon the two major surviving works on history and natural history that his reputation as a scholar and scientist depend. These are sufficient to make him one of the encyclopedic figures in Islamic science, one whose innate thirst for knowledge led him to the examination of nearly every form of science and the observation of many pertinent aspects of both human and natural history.

### *Abū ʿAlī al-Ḥusain ibn Sīnā (370/980–428/1037)*

Ibn Sīnā, the Latin Avicenna, whose compatriots have given him the honorific title *Shaikh al-raʾīs*, "Leader among Wise Men," is the greatest philosopher-scientist of Islam and its most influential figure in the general domain of the arts and sciences. Born near Bukhara in a family devoted to learning he received an excellent education, especially after the family moved to the city of Bukhara itself. His father acquired the best teachers in every domain for his remarkably precocious son who at the age of ten had already mastered grammar, literature and even some theology and knew the Quran by heart. At the age of eighteen he had mastered all the sciences of his day. At the end of his life he wrote that he knew then only what he had learned in his youth.

Because of changing political conditions in Central Asia and the death of his father, Avicenna left his birthplace and set out for the different cities of Persia beginning a life of wandering which continued to his last days. Already well known as a physician whose services were sought by all, he found willing patrons everywhere. He stayed in Rai, then for some time in Hamadan where he even became vizier and encountered political difficulties, and Isfahan where he had a relatively long period of peace. In all these cities he

acted as physician to the Buwayhid princes who then ruled Persia. Finally anticipating his own death he returned to Hamadan where he died and where his mausoleum is found today.

Avicenna was a man of enormous energy. Although living in turbulent times and often occupied with state matters he wrote two hundred fifty works of different lengths, some of which were actually dictated on horseback while accompanying a ruler to some battle. His power of concentration and mental acumen have become proverbial in the East. Of his works the best known is first the *Canon of Medicine* which is the epitome of Islamic medicine, taught to this day in the Orient. It was translated into Latin and taught for centuries in Western universities, being in fact one of the most frequently printed scientific texts in the Renaissance. The second is his monumental encyclopedia, *The Book of Healing (Kitāb al-shifā')*. It marks the high point of Peripatetic philosophy in Islam and also contains important chapters on logic, and mathematical and natural sciences. Sections of this work were translated into Latin in the sixth/twelfth century, first as part of the *Incunabula* and later as a separate work. Since the word *al-shifā'* resembles the Hebrew word *shefʿa* meaning abundance or sufficiency, and the work reached Latin through Hebrew, the title in Latin became *Sufficientia.* Moreover, only parts of the *Physics* became known as the *Sufficientia* whereas the other sections of the book gained independent titles. The section on geology and mineralogy for example became known as *De Mineralibus* and was attributed to Aristotle until modern times.

The influence of Avicenna on both East and West was immense. In the Islamic world his spirit has dominated the intellectual activity of all later periods while his philosophy and medicine have continued as a living influence to the present day. In the West he became known as the "Prince of Physicians" and dominated medical science for centuries while his scientific, philosophical and theological views left their mark upon many important figures such as Albertus Magnus, St. Thomas, Duns Scotus and Roger Bacon.

### *Abū ʿAlī al-Ḥasan ibn al-Haitham (c.354/965–430/1039)*

Ibn al-Haitham, the greatest of Muslim physicists, known to the West as Alhazen, was born in Basra where he studied mathematics and other sciences. At that time the Fatimid

dynasty of Egypt showed much interest in the sciences, and Alhazen was invited to come to Egypt to study the possibility of controlling the Nile floods. Having accepted the task, he set out for Egypt where he was received with much honor. But after failing to come up with a flood-control plan, he fell into disgrace and to protect himself from the wrath of the ruler began to feign insanity. For the rest of his life he lived quietly, often copying mathematical manuscripts to earn his living. He finally died in Cairo.

Alhazen is known to have written nearly two hundred works on mathematics, physics, astronomy and medicine, as well as on other scientific subjects. He also wrote commentaries on Aristotle and Galen. Although he made major contributions to the fields of mathematics and astronomy it is especially in the domain of physics that he made his outstanding achievements. He was an exact observer and experimenter as well as a theoretician. His major work, *Optics,* is the best medieval work of its kind, a work that influenced the optical writings of Roger Bacon, Witelo and Kepler in the West, and many later treatises by Muslim scientists. Alhazen also made significant contributions to the study of the anatomy and diseases of the eye.

### *Abū Raiḥān al-Bīrūnī (362/973–c.442/1051)*

Some have considered al-Bīrūnī as the greatest Muslim scientist. Certainly he is among the foremost intellectual figures of Islam. Born near Khwarazm he studied mathematics with a student of the famous Abu'l-Wafā' and became proficient in it. Later he journeyed extensively in the northern regions of Persia and when Maḥmūd of Ghazna conquered Central Asia, he joined the services of this powerful ruler. He even accompanied him in his conquest of India which enabled him to observe this land firsthand. After this, al-Bīrūnī returned to Ghazna where he lived the rest of his days writing and studying to the very end of his prolific life.

Every one of al-Bīrūnī's writings, of which about one hundred eighty are known, is of value since he was both a great scientist and scholar. His *India* is the best account of the Hindu religion and of the sciences and customs of India in medieval times. His *Chronology of Ancient Nations* dealing with the calendar and festivities of different nations is unique. His *Canon of al-Mas'ūdī* dedicated to Maḥmūd of Ghazna's son, Mas'ūd, holds the same position in Islamic astronomy

as the *Canon* of Avicenna does in medicine while his *Elements of Astrology* was the standard text for the teaching of the *Quadrivium* for centuries. He also wrote outstanding works on physics, mathematical geography, mineralogy and nearly every branch of mathematics, astronomy and astrology. No one in Islam combined the qualities of an outstanding scientist with that of a meticulous scholar, compiler and historian to the same degree as al-Bīrūnī. His only misfortune as far as his later influence is concerned was that his works were never translated into Latin. In the East he has always been respected as both a scientist and scholar.

### *Abu'l Qāsim Maslamah al-Majrīṭī (d. c.398/1007)*

Little is known of the life of this Andalusian scientist who was one of the first to introduce the study of the sciences, especially mathematics and alchemy, to the western part of the Islamic world. It is known that he was born in Madrid and later moved to Cordova where he established a school in which such figures as the historian Ibn Khaldūn and the physician al-Zahrāwī were to study later. He was also responsible for spreading the *Epistles* of the Brethren of Purity, an encyclopedia of knowledge with a Pythagorean tinge which had just become popular in the East, in Andalusia. Some attribute to him the treatise that summarizes the contents of the fifty-two *Epistles.* Although he wrote on astronomy and mathematics and in fact commented on the tables of al-Khwārazmī, his most important works are on alchemy. *The Sage's Step* and *The Aim of the Wise,* two of the best-known works in Islamic alchemy, are either by him or directly inspired by his teachings. The latter was translated into Latin as *Picatrix* and became a mainstay of alchemical literature in the West.

### *Abū Ḥāmid Muḥammad al-Ghazzālī (450/1058–505/1111)*

Al-Ghazzālī (the Latin Algazel) was not a scientist or philosopher in the usual sense, yet he left such a profound mark upon the intellectual life of Islam that no account of the history of Islamic science can be adequate without a discussion of his role. Born in Tus, where early in life he was introduced to the teachings of Sufism, he went to Naishapur to study theology with al-Juwainī. He became so famous as a theologian and scholar of religious sciences that at a young

age he was called to Baghdad to occupy a chair in the foremost university of that time, the Niẓāmīyah. But here, as a result of close study of both philosophical and scientific works, al-Ghazzālī underwent a deep spiritual crisis. He left his post and renounced his worldly position, finally finding the light of certainty in Sufism. After a period of self-discipline and ascetic practices during which he became himself an outstanding Sufi master, al-Ghazzālī returned to society. He went first to Naishapur where he taught for a while and finally retired to Tus with a few choice disciples.

His most important religious work is *The Revivification of the Religious Sciences*, which is the most outstanding Muslim work on spiritual ethics. Al-Ghazzālī also wrote on logic and philosophy. His importance in this domain, however, is not in exposition but in criticism. In *The Purposes of the Philosophers* he summarized Peripatetic philosophy so well that when this work was translated into Latin, he became known in the West as an authority on Peripatetic philosophy. *The Purposes of the Philosophers* served as the preparation for his severe criticism of the philosophers in *The Incoherence of the Philosophers* where he attacked the rationalistic tendencies inherent in Aristotelian philosophy and criticized some of the views of Avicenna and al-Fārābī. Because he was an outstanding figure personally and a forceful writer as well, he succeeded in curtailing the influence of Peripatetic philosophy in Islam, particularly in the Sunni world. At the same time he legitimized the teaching of Sufism in formal religious circles. Through these two important steps he helped more than any other single individual to bring about the intellectual transformation that took place in the Islamic world during the sixth/twelfth century. He is in every way one of the most notable religious and intellectual figures of Islam.

### *Abu'l-Fatḥ ʿUmar ibn Ibrāhīm al-Khayyāmī (Omar Khayyam) (b. 429/1038–440/1048, d. 517/1123–526/1132)*[1]

ʿUmar Khayyām, the most famous Persian poet in the West, was also among the most notable scientists of the medieval period. Practically nothing is known of his life save that he was born near Naishapur where he spent most of his days and died in that city. His tomb is there and, to this day, is visited by people from near and far. In 467/1074–75

[1] There is so little known of the life of Khayyām that the date of both his birth and death are contested by scholars, the date of death varying by as much as twenty years.

he was already a famous mathematician and was called in by Malikshāh to reform the calendar. This calendar, known as the Jalālī calendar, is still in use in Persia and is more accurate than the Gregorian. Khayyām was highly respected by his contemporaries as a master of the sciences although he wrote little and accepted few students. In one of his treatises he calls himself a student of Avicenna, but since he lived much later this could only mean that he considered himself as belonging to the school of Avicenna and, in fact, he translated one of Avicenna's works from Arabic into Persian.

About a dozen treatises of Khayyām's on philosophy and science have survived, the most important being his *Algebra* which is the best work of its kind in medieval mathematics. He also wrote on geometry and physics as well as on metaphysical questions. His *Quatrains* translated beautifully, although somewhat freely, by Fitzgerald have made him the best known literary figure of the East in the West. But they have also depicted him as the chief propagator of the philosophy of "live, drink and be merry," whereas in reality he was a Sufi and a gnostic. He wrote his quatrains, not as a denial of the possibility of attaining certitude, but as a corrective for the kind of religious hypocrisy that mistakes relative forms for the Absolute Truth which the forms are meant to convey. Behind the apparent skepticism of Khayyām lies the absolute certainty of intellectual intuition. In the Islamic world the influence of Khayyām was foremost in the domain of mathematics and his philosophical position was judged by his metaphysical and philosophical treatises. These show him to be a true hakim as do his quatrains which contain spontaneous reflections upon different aspects of human existence and, if seen in the correct light, confirm rather than deny the gnostic background of his thought. Khayyām is perhaps the only figure in history who was both a great poet and an outstanding mathematician. Islam has produced a few other figures who have been accomplished in both domains but none with the brilliance of Khayyām.

### *Abu'l-Walīd Muḥammad ibn Rushd (520/1126–595/1198)*

Ibn Rushd, or Averroes, the purest Aristotelian among Muslim philosophers, was born in Cordova of an illustrious family of judges and religious scholars. He studied law and medicine in Cordova and later journeyed to Marrakesh to con-

tinue his studies. He became an authority in religious law and medicine, as well as in philosophy. He was a judge in Seville and Cordova and also the personal physician of the caliph. Later in life he was attacked for his philosophical views, but was reinstated into a position of honor at court a short while before his death.

Averroes was the greatest medieval commentator on Aristotle. St. Thomas called him "the Commentator" and Dante referred to him as "he who made the grand commentary." According to H. A. Wolfson, one of the leading authorities on medieval philosophy and particularly on the commentaries of Aristotle, there are altogether thirty-eight commentaries by Averroes on different works of Aristotle in addition to short treatises devoted to particular aspects of Aristotelian philosophy. Averroes usually wrote a short, a medium-length and a long commentary on every subject he dealt with in conformity with the method of teaching in traditional schools. Upon five works of Aristotle, including the all-important *Physics* and *Metaphysics*, all three of Averroes' commentaries have survived. In addition, Averroes wrote independent works on astronomy, physics, and medicine. He sought to answer al-Ghazzālī's attack on philosophers in his *The Incoherence of the Incoherence*. However, this work did not have as much influence in the Muslim world as al-Ghazzālī's original attack. In fact as far as the world of Islam is concerned the influence of Avicenna was greater than that of Averroes.

In the West, however, Averroes must be considered as the most influential Muslim thinker. In fact, most of his works survive today in Latin and Hebrew versions rather than the original Arabic. He was translated not only in the seventh/thirteenth century into Hebrew and Latin but once again in the tenth/sixteenth century when his commentaries attracted new attention and became the subject of heated debate. Altogether, however, his image in the West as the opponent of revealed religion does not conform to his real nature and there is a difference between Averroes as a Muslim philosopher and the "Latin Averroes" seen in the West through a misunderstanding of some of his teachings.

### *Naṣīr al-Dīn al-Ṭūsī (597/1201–672/1274)*

If we consider the whole domain of the arts and sciences and philosophy together, then no doubt after Avicenna the

most dominant figure is Naṣīr al-Dīn al-Ṭūsī. Others like al-Bīrūnī displayed the same universal scientific genius but no one except Avicenna was able to leave a permanent imprint upon so many fields as Naṣīr al-Dīn. Born in Tus, Naṣīr al-Dīn studied mathematics with Kamāl al-Dīn ibn Yūnus and gained fame as an astronomer. At a time when Khurasan was being threatened by the Mongol invasion and there was much political uncertainty, Naṣīr al-Dīn began his career in the service of some of the Ismaili princes. When Hulagu conquered Persia, Naṣīr al-Dīn, knowing that there was no way of preventing massive destruction, tried to salvage all that was possible by rendering his services as an astrologer and astronomer to Hulagu. In this way he gained the Mongol ruler's confidence and saved many libraries and educational institutions. He was put in charge of religious endowments and was able to induce Hulagu to establish the Maragha observatory and scientific institution. As its director he brought mathematicians from near and far to this center and was personally responsible for the revival of the study of astronomy and mathematics in Islam. He spent most of his later years in Maragha and then at the end of his life went to Kazimain near Baghdad where he died and was buried next to the tomb of Mūsā al-Kāẓim, the seventh Shiite imam.

Naṣīr al-Dīn was a prolific writer in both Arabic and Persian. He wrote commentaries on the whole cycle of Greek mathematical texts from Euclid to Ptolemy. He also wrote independent works in both mathematics and astronomy in which he criticized Ptolemy and even proposed a new planetary model. He also participated in the compilation of the astronomical tables in Maragha named after the Ilkhānids. Naṣīr al-Dīn is the author of several definitive works on Ismaili doctrines written when he was in their hands. He revived the philosophy of Avicenna by answering the attacks made against him by theologians. He is the author of the *Nasirean Ethics,* the most widely read work of ethics in the Persian language. Being a twelver Shiite he also wrote several works on Shiite theology including the *Catharsis* (*Tajrīd*), which is the most famous work of its kind and is still studied in all Shiite religious schools. Moreover, Naṣīr al-Dīn composed an excellent treatise on Sufism and even wrote a few verses of poetry. In practically every field from theology and philosophy to mathematics and astronomy he left outstanding works. His influence in the Islamic world, particularly the eastern part of it, has been immense. In the West, however, only his astronomical and mathematical works were trans-

lated, but they became quite important and influential during the late Middle Ages and the Renaissance.

### *Quṭb al-Dīn al-Shīrāzī (634/1236–710/1311)*

Quṭb al-Dīn, the most celebrated student of Naṣīr al-Dīn al-Ṭūsī, was born in Shiraz in a family of physicians. There he received his early education in medicine and also became a Sufi through the influence of his father. Then he set out for Maragha where he studied with Naṣīr al-Dīn who advised him to study mathematics and astronomy. He traveled throughout Persia, Syria and Asia Minor where he studied Sufism with Ṣadr al-Dīn al-Qunawī, the disciple of the famous Ibn ʿArabī, in Konya. Later he journeyed to Egypt where he stayed for some time and then returned to Persia, settling in Tabriz where he died.

Quṭb al-Dīn is one of the major commentators on Avicenna's medical works. He wrote one of the most widely read commentaries upon the *Canon,* and also composed numerous works on optics, geometry, astronomy, geography, philosophy and the religious sciences. He is the best known commentator on the Illuminatist doctrines of Suhrawardī, and was himself the author of several encyclopedic works that deal with many important physical and astronomical questions. Like most of the later figures of Islamic history, although famous in the East, he was not known in the West.

### *ʿAbd al-Raḥmān Abū Zaid ibn Khaldūn (732/1332–808/1406)*

Ibn Khaldūn, whose significance as a "philosopher of history" and master of the science of human behaviour has been discovered only recently, belonged to a family that had come originally from the Yemen and settled in Spain. He himself was born in Tunis where he studied both the religious and philosophical sciences, being particularly interested in the teachings of Naṣīr al-Dīn al-Ṭūsī. He became a royal secretary at the court of many different princes, thus traveling throughout North Africa and Spain. Then he set out on a pilgrimage, stopping on the way in Cairo where he lectured for a while at al-Azhar. He even accompanied the Mamluk ruler of Egypt to Damascus in the campaign against Tamerlane and helped negotiate the surrender of that city. Finally he established himself in Cairo where he died.

Ibn Khaldūn, in a career which was continuously connected with positions of political power, developed into a keen observer of the political life of his times. His sense of observation and his philosophical and metaphysical training enabled him to become an outstanding student of the science of man. He wrote on mathematics, theology and metaphysics, but his outstanding work is as a historian. His *Kitāb al-ʿibar* whose full title can be translated as *Instructive Examples and Records of Origins and Events concerning the History of the Arabs, Persians, Berbers and their contemporaries who possessed Great Powers,* besides containing an excellent history of North Africa begins with the *Muqaddimah* or *Prolegomena* upon which Ibn Khaldūn's particular fame is based. In this work he analyzes the causes for the rise and downfall of civilizations and cultures and makes especially pertinent comments on Islamic civilization. Besides summarizing the sciences, he also discusses the reasons for their cultivation in particular periods and the lack of interest in them in others. This work marks Ibn Khaldūn as one of the masters of the science of man and human culture.

### *Bahāʾ al-Dīn al-ʿĀmilī (953/1546–1030/1621)*

Even in Islamic civilization Bahāʾ al-Dīn al-ʿĀmilī is remarkable for his many-sided genius. He was born in Baalbek in present-day Lebanon into a well-known Shiite family. At the age of thirteen, his father took him to Persia which, under the Safavids, was now beginning to attract Shiite scholars from near and far. He studied in Qazwin and Khurasan and became a famous religious scholar as the *shaikh al-islām,* that is to say the chief religious authority in the country, of Isfahan, the Safavid capital. At the same time he was a fervent, practicing Sufi and he composed many Sufi works in both Persian and Arabic which are still very popular. He became one of the most famous men of the Safavid renaissance and resided in Isfahan until the end of his life when he went to Meshed where he died and lies buried today. His tomb, like that of Naṣīr al-Dīn, is visited by the pilgrims who flock regularly to the Shiite shrine cities, such as Meshed and Kazimain.

Bahāʾ al-Dīn was not only a theologian and a Sufi, but also a well-known mathematician, architect, alchemist and authority on the occult sciences. He revived the study of mathematics and wrote treatises on mathematics and astronomy to

summarize the works of earlier masters. He was the last religious scholar in Islam who was also a notable mathematician. Henceforth the teaching of mathematics deteriorated in official religious schools in Persia as it had done somewhat earlier in the western lands of Islam. After Bahā' al-Dīn gnostics and philosophers continued to appear, like his own student, Ṣadr al-Dīn al-Shīrāzī, who is the greatest of the later Muslim philosophers. But Bahā' al-Dīn was perhaps the last of the universal figures of learning in Islam, whose genius touched every field of knowledge from gnosis and theosophy to architecture and landscape design, and who in this way personified, like his predecessors, the ideal of the unification of knowledge which Islam has always sought to propagate and realize.

CHAPTER 9

# ART AND ARCHITECTURE

## PRIMITIVE ISLAM

The proper usage of the collective name 'Islamic art' has been seriously questioned by a number of scholars during the past two or three decades. As alternatives 'Arab art', 'Persian art', 'Turkish art' have been suggested. Others have even gone as far as denying any common ground or characteristics in this art, and claimed that it should be simply named after the respective country where the monuments stand or where particular art objects were produced. It seems desirable, therefore, before describing the achievements of Islamic art, to answer these critics; to define, as far as is possible, the common characteristics of Islamic art, to reveal its sources and to throw some light upon the foreign influences which contributed to its evolution.

It is a well-known and accepted fact that the Arabs had hardly anything which could be called art when they set out to invade the territories in the north. There was a highly developed architecture in southern Arabia well before the advent of Islam, but that had hardly anything to do with those primitive tribesmen who were united under Islam, and who constituted the backbone of its victorious army. Neither had the Prophet any intention of giving an impetus to a religious art. Indeed, we cannot talk about Islamic art in a religious sense, as we can talk about Christian or Buddhist art.

It was the helping hand of highly skilled craftsmen and artists of the conquered territories which provided the resources needed to erect and adorn the earliest religious and secular buildings of Islam. The effect of these cultures—Byzantine, Coptic, Sasanian and later on Central Asian—can be clearly recognized and distinguished in the early period. Thus we cannot speak of an Islamic style during the first one or two centuries of the *Hijra*. From the amalgamation of these foreign elements, which can be regarded as the sources of this new type of art, was born a new style which made its imprint on art and architecture throughout the Islamic world. The late Sir Thomas Arnold formulated the concept of Islamic art—or, as he called it, 'Muhammadan art'—in the following way: 'By the term "Muhammadan art" is meant those works of art which were produced under Muhammadan patronage and in Muham-

madan countries; the artists themselves were of diverse nationalities and were not always adherents of the faith of Islam'.[1]

No monument has survived from the earliest period of Islam. The earliest mosques, such as the Prophet's mosque at Medina, or those of Kūfa and Baṣra, were primitive structures, erected of perishable material. The Prophet, it seems, had no intention of erecting temples for daily prayer. Yet his house in Medina soon became a public building, a gathering place for Muslims and later a *masjid*, a mosque. A detailed description of his house is preserved by Ibn Sa'd. It was a primitive structure with a central court surrounded by mud-brick walls. It had a roofed portico on the north side, the roof being supported by palm trunks. There were also small huts attached to it on the east side which served as dwelling places for the Prophet's wives.

In the first two years of the *Hijra* the *qibla* or direction of prayer was on the north side of the building, that is towards Jerusalem; but after a sudden revelation the Prophet changed it towards the Ka'ba in Mecca. Orientation of prayer or *qibla* was an accepted custom in many religions, but was particularly important among the Semitic people. In Islam the *qibla* is marked by the *miḥrāb*, which is usually a niche placed in the centre of the *qibla* wall. The *miḥrāb* in niche form was first erected in Medina, when they rebuilt the Prophet's mosque in 88/706–7. Before that it was indicated by a strip of paint on the *qibla* wall or a block of stone placed in the centre.

There was also a simple pulpit or *minbar* in Medina, which was later on generally accepted in Islam. Another important feature of the sanctuary, introduced by the first Umayyad caliph, Mu'āwiya, was the *maqsūra*, a place reserved for the caliph and surrounded by a wooden screen.

Three more mosques had been erected during the reign of the Patriarchal Caliphs. The first was at Baṣra in 14/635 and the second at Kūfa in 17/638. The third mosque was built by 'Amr b. al-'Āṣ, the conqueror of Egypt, at Fusṭāṭ in 21–2/641–2. Historians also gave account of an early mosque in Jerusalem, built by the Caliph 'Umar in 16/637. All these mosques were again primitive buildings, following generally the plan of the Prophet's mosque at Medina.

## THE UMAYYAD PERIOD

It was under the Umayyad Caliph 'Abd al-Malik (65–86/685–705) that the first surviving monument of Islam was erected. It is the Qubbat

[1] *Painting in Islam* (Oxford, 1928), n. 1.

al-Ṣakhra, the Dome of the Rock in Jerusalem. It was built above the Holy Rock where David's altar stood and from where, according to legend, the Prophet made his famous night journey to heaven.

The building is an octagonal structure surrounding the rock. Above there is a huge wooden dome resting on a high drum supported by four piers and twelve columns. Between this colonnade and the outer walls is an intermediate octagon supporting the sloping roof of the building. The outer walls are decorated by eight large bays on each side. Five of these bays have been pierced by windows. The upper part of the walls was coated by faience tiles in the early tenth/sixteenth century. There are four doors in the building facing the four cardinal points. Below the rock there is a small chamber with two small *miḥrābs*.

The decoration inside the arcades and of the drum consists of beautiful glass mosaics, most of which are original. These mosaics display fruits, vine and acanthus scrolls and trees, some of them adorned with jewels. They also include a Kufic inscription giving the date of completion as 72/691. The mosaics reveal both Byzantine and Sasanian influences. They were most likely made by Syrian mosaicists, as there was a famous school in Syria in pre-Islamic times.

'Abd al-Malik had a number of reasons, mainly political, for erecting such a splendid mosque for Islam. First of all the new faith had to compete with the beauty of Christian churches in Jerusalem, such as the Holy Sepulchre, which it seemed to imitate. Also he had a rival caliph, Ibn al-Zubayr in Mecca. For this reason he wanted to prevent pilgrims from visiting Mecca. That would explain the unusual plan of the building which makes possible a circumambulation of the holy rock, just as Muslims circumambulate the Ka'ba.

Ibn Taghrī-Birdī mentions that 'Abd al-Malik even had the intention of turning the *qibla* back from Mecca to Jerusalem.[1] Al-Ḥajjāj's contemporary mosque at Wāsiṭ certainly supports that surmise. Archaeologists, when searching for his mosque and palace, found four different mosques one above the other. The upper three buildings were properly oriented towards Mecca, but the lowest mosque with al-Ḥajjāj's palace attached to it, had a deviation of 34 degrees towards the west. A second mosque, that of Isqaf Banī Junayd, a little north of Baghdād, also attributed to al-Hajjāj, had almost the same deviation.[2]

Another important mosque, the Great or Umayyad Mosque in

[1] Ibn Taghrī-Birdī, *al-Nujūm al-ẓāhira*, I, 71.

[2] Verbal information given by my Iraqi colleague, Dr 'Abdul 'Azīz Ḥamīd.

Damascus, was erected by the Caliph al-Walīd, son of 'Abd al-Malik. This huge rectangular building was originally a pagan temple, dedicated to Jupiter. Later it was converted to a Christian church. After the Arab conquest of Damascus the building was jointly used by Muslims and Christians. When Damascus became the capital of the Umayyad empire, and the number of Muslims greatly increased in the city, the entire building was taken over from the Christians. That was in 86/705 when al-Walīd succeeded his father as caliph.

Al-Walīd ordered a complete reconstruction of the building. They demolished the inside walls but left the enclosure walls intact, except that the three main entrances on the south side were walled up and new ones were opened on the north. The original building had a tower at each corner; these were also left untouched and served as the first minarets in Islam. Of these four minarets only one, over the south-west corner, survives today. The minaret over the northern entrance is much later, probably as late as the sixth/twelfth century.

Internally, the courtyard (*ṣaḥn*), is surrounded by porticoes on three sides and by the impressive façade of the sanctuary on the south side. The sanctuary has three aisles running parallel to the *qibla* wall, with a trancept in the centre. There are four semicircular *miḥrābs* in the *qibla* wall. One of them, in the centre of the eastern half of this wall, is known as 'the *miḥrāb* of the Companions of the Prophet'; it is the second concave *miḥrāb* in Islam. The other three are later in date.

The walls of the mosque were decorated with mosaics, parts of which are still preserved. These mosaics, in contrast to those of the Dome of the Rock, display not only floral designs, but mainly architectural elements. The walls of the western portico, which were whitewashed at a later date, revealed the most beautiful mosaic panel, known to scholars as the 'Baradā panel' after the river which flows through Damascus. It represents contemporary Damascus with its palaces and houses and the villages of the Green Valley [pl. 1(*a*)].

Umayyad architecture, however, was not confined to religious buildings. The Umayyad caliphs longed for the open spaces of the desert, and therefore erected richly decorated palaces and baths in the Jordanian and Syrian steppe. Several of these buildings have been discovered and excavated during the last sixty years. One of the most impressive, and probably the earliest of them all, is Mshattā, some forty miles south of 'Ammān. For a long time it was considered a pre-Islamic building. Its Umayyad origin, however, has now been firmly established: a

semicircular *miḥrāb* was found in the southern part of the building, and a few years later, during the course of excavations by the Jordanian Department of Antiquities, Kufic inscriptions and an Umayyad coin were found.

Mshattā is a square walled enclosure (473 feet, 144 metres) with semicircular intermediate towers on each side and two octagonal ones flanking the gateway on the south side. Internally the enclosure is divided into three tracts, the central ones being somewhat wider than the outer ones. Work was never completed in Mshattā, with the exception of the northern, or palace part of the central tract. Here there was a large hall ending in three apsidal recesses and probably covered by a dome [pl. 1(*b*)].

The outer face of the enclosure wall on the south was richly carved. The design is mainly based on vine and acanthus scrolls enclosing birds and lions. Most of this decorated façade is now in the East Berlin Museum.

The small bath of Quṣayr 'Amra, about fifty miles east of 'Ammān, was attributed to the Caliph al-Walīd [pl. 2(*a*)]. Recent research, however, points to a somewhat later date. The building is composed of a large audience hall with an entrance on its northern side, and a small alcove opposite. The alcove is flanked by two small apsidal rooms on either side. There are two more small rooms attached to the audience hall on the eastern side, continued by a third, domed room which has apsidal recesses.

The building is particularly famous for its frescoes. The frescoes were unfortunately damaged during the last fifty years, but they were copied by an Austrian painter at the beginning of this century.[1] There are in particular, two frescoes which assist us in dating this structure. The first painting is that of an enthroned monarch on the back wall of the little alcove [pl. 2(*b*)]. It has a Kufic inscription which refers to a prince, probably the owner of the building. The second painting represents six kings with four inscriptions underneath in Arabic and Greek. The inscriptions identify the first four figures as those of the Byzantine emperor, the Visigothic king of Spain, the emperor of Persia and the negus of Abyssinia.

The largest and probably the most beautiful Umayyad palace is Khirbat al-Mafjar in Jericho. The vast enclosure includes a number of buildings. The palace areas surround the square courtyard with a monumental entrance on its eastern side. The decoration consisted of richly

[1] *Kuṣejr 'Amra*, Kaiserliche Akademie der Wissenschaften (Vienna, 1907), 2 vols.

carved stones and stuccoes, but fragments of fresco paintings were also discovered. North of the palace, the excavators discovered a huge bath which was covered with a dome. The floors were covered with mosaics, revealing some unusual designs [pl. 3(*a*)]. Recent excavations by the Department of Antiquities behind the bath uncovered workshops and storerooms, which may prove that Khirbat al-Mafjar was not only a palace, but an Umayyad town, just as 'Anjarr in Lebanon.

There are two great palaces in the Syrian desert, both attributed to the Caliph Hishām (105–25/724–43), Qaṣr al-Ḥayr al-Sharqī, north-east, and Qaṣr al-Ḥayr al-Gharbī, south-west of Palmyra. In the latter building two frescoes were discovered by the excavators, one of them revealing western, the other Sasanian influences. Excavation in Qaṣr al-Ḥayr al-Sharqī is in progress.

The Caliph Marwān II (127–32/744–50) moved his capital from Damascus to Ḥarrān in northern Mesopotamia (today in southern Turkey). Very little is known about his buildings in Ḥarrān, but the minaret of the Great Mosque may date from that period.

Finally, a small marble *miḥrāb* should be mentioned, which is at present in the Archaeological Museum in Baghdād. It is called the 'Khāṣṣakī *miḥrāb*', because it was found in a mosque bearing that name. Until quite recently it was considered to be an early 'Abbasid work. The *repertoire* of its decoration, however, rather suggests an Umayyad date and a Syrian origin.

Very little is known about the decorative arts of the Umayyad period. Potteries which were found in the Umayyad palaces were either plain coarse kitchen utensils, or reddish-brown painted unglazed wares. No glazed pottery is known from that period. A metal object, a ewer, should be mentioned here as it is connected with the name of the Caliph Marwān II [pl. 3(*b*)]. It was found with other metal objects near Marwān's tomb in the Fayyūm area in Egypt. The ewer has a globular body with a high tubular neck ending in a pierced decoration, and has a spout in the form of a cock and an elaborate handle. The body has engraved decoration consisting of a row of arches with rosettes and animals. The ewer was definitely made in Persia, and like all other early Islamic metalwork reveals a strong Sasanian influence.

### EARLY 'ABBASIDS AND TULUNIDS

The Umayyad dynasty was otherthrown by the 'Abbasids in the year 132/750. The second 'Abbasid caliph, al-Manṣūr (136–58/754–75)

founded the new capital, Baghdād, on the River Tigris. Nothing has survived of al-Manṣūr's city, as it was destroyed by the Mongols in 656/1258, and modern Baghdād was built upon the ruins. For this reason, excavations are hardly possible. However, we have quite a considerable amount of information from contemporary sources of its ground plan.

It was a round city, enclosed by two parallel walls made of mud bricks. There were four gateways in the walls, roughly facing the four cardinal points: the Baṣra Gate on the south, the Kūfa Gate on the west, the Syrian Gate on the north and the Khurāsān Gate on the east. In the centre of the city stood the caliph's palace, called the Palace of the Green Dome. The Great Mosque was attached to the palace on the south side. It was a simple structure. Later it was enlarged and decorated by Hārūn al-Rashīd (170–93/786–809) and al-Mu'taḍid (279–89/892–902). The construction of the city was completed by 149/766.

Some 120 miles south-west of Baghdād and roughly thirty miles from Karbalā' lies the fortified rectangular enclosure of Ukhayḍir [pl. 4(*a*)]. It has a gateway on all four sides and ten intermediate half-round towers. In the northern half of the enclosure is the palace area connected with the main entrance. In the centre is the court of honour, flanked by living quarters on each side. There is a small mosque in the western part of the enclosure, which has a small rectangular *miḥrāb*. In the corners of the enclosure are staircases leading up to the gallery on the second floor, which runs right round. The exact date of the building is not yet known, but it is believed to be of the third quarter of the eighth Christian century.

From about the same period dates the earliest surviving mosque of Persia, the Tārī Khāna in Dāmghān. Because of its ground-plan and exceptionally large bricks it was formerly considered to be a Sasanian building. The plan is quite simple: a rectangular enclosure surrounded by a single arcade on three sides and a sanctuary three aisles deep on the fourth. The original *miḥrāb* had a rectangular form, as *miḥrābs* usually have in Persia. At present it has an oblique form, since it had to be stilted so as to correct the *qibla* direction. There is no sign of any decoration in the building. A trial excavation which was made in the middle of the courtyard proved that the building is entirely a Muslim construction.[1]

[1] Erich F. Schmidt, *Excavations at Tepe Hissar, Damghan* (Philadelphia, 1937), 12–16.

During al-Mu'taṣim's caliphate (218–27/833–42) the riots of the Turkish troops caused so many disturbances in Baghdād that the caliph ordered the erection of a new capital, Sāmarrā, further up the Tigris. Immense palaces and mosques were built there by al-Mu'taṣim and by his successors. The Jawsaq al-Khāqānī palace, erected by al-Mu'taṣim, had a triple-arched entrance, the so-called Bāb al-'Āmma [pl. 4(*b*)]. The throne-room was built in a cross-shaped form, the centre of which was originally covered by a dome. The excavators recovered marble and stucco fragments which originally must have ornamented the walls. The harem was decorated with wall paintings showing dancing figures, birds and large garlands [pl. 5(*b*)].

The Great Mosque of Sāmarrā, built by al-Mutawakkil (232–47/847–61), is the largest mosque in Islam. Only the enclosure walls have survived, along with its helicoid minaret [pl. 5(*c*)]. In the mosque the excavations again revealed stucco fragments and glass mosaics. The Sāmarrā excavations, which were conducted by Ernst Herzfeld and Friedrich Sarre before the First World War, uncovered a second, the Balkuwārā palace, at the southern part of the city. The vast rectangular enclosure included a palace complex and two small mosques richly decorated with stucco and mosaics. This palace is also attributed to al-Mutawakkil.

The same caliph was responsible for the construction of the Ja'fariyya district somewhat north of Sāmarrā. It was here that the second great mosque of the city was erected. That was the mosque of Abū Dulaf, which is better preserved than the Great Mosque. The courtyard is surrounded by arcades, two aisles deep on the north. The sanctuary is divided into seventeen aisles running perpendicular to the *qibla* wall. The *miḥrāb*, for some unknown reason, was doubled. The minaret is similar in form to that of the Great Mosque. Recent excavations by the Iraqi Department of Antiquities uncovered a palace behind the sanctuary.

During the reign of al-Mu'tamid (256–79/870–92), Sāmarrā was abandoned, probably in the year 270/883. Thus its building activities are confined to only forty-seven years, which allows a nearly accurate dating. The great importance of Sāmarrā lies in two facts: first, that the stucco decorations reveal three distinct styles, clearly indicating the main sources of Islamic art [pl. 5(*a*)]; secondly, that it is here that, for the first time, artistic Islamic pottery was found.

Herzfeld recognized the three Sāmarrā styles, and called them the First, Second and Third styles. Professor Creswell, however, realized

that the earliest style was Herzfeld's 'Third Style'. He therefore changed the order, the Third Style becoming 'Style A', the Second 'Style B' and the First 'Style C'. In 'Style A' the ornaments are based mainly on floral and plant patterns (vine scrolls, pine-cones, palmettes, etc.), arranged within geometrical compartments. In 'Style B' the patterns are again taken from the plant motives but appear in an abstract form. These first two styles are related to each other, but are totally different from 'Style C'. The latter style displays for the first time Central Asian elements, obviously introduced to Mesopotamia by Turkish artists. Certain elements in this style even reveal Far Eastern motives as well.

Far Eastern influence is, however, more evident in the pottery which has been exposed from the palaces and houses of Sāmarrā. From the excavated material four types of pottery can be distinguished: (1) the unglazed wares with incised or relief decorations; (2) lead-glazed mottled wares [pl. 6(*a*)]; (3) a great variety of tin-glazed vessels which were painted in cobalt blue, yellow or green, sometimes displaying abstract designs [pl. 6(*b*)]; (4) the celebrated lustre technique, which at the beginning started in polychrome [pl 6(*c*)]. No figural subject appears in polychrome lustre, except cocks on some wall-tiles and a peacock on a bowl which is in the Ashmolean Museum, Oxford. By the beginning of the fourth/tenth century lustre became monochrome and vessels from that period display primitively drawn human figures and animals. The production of fine pottery apparently started under Chinese influence, by imitation of the imported T'ang pottery and porcelain. That particularly applies to the mottled and tin-glazed wares. The lustre technique was entirely a Near Eastern invention.

Aḥmad b. Ṭūlūn, who became the governor of Egypt in 254/868 and founded an autonomous dynasty there, built a new city north of Fusṭāṭ. It was here that he erected a congregational mosque which was called after him. Its plan, a rectangular courtyard surrounded by porticoes, two aisles deep on three sides and five aisles on the *qibla* side, the stucco decorations and the form of the minaret, reveal strong stylistic connexion with Sāmarrā [pls. 7(*a*) and (*b*)].

## SPAIN AND NORTH AFRICA

The famous mosque of Cordova was erected by 'Abd al-Raḥmān I in 168-9/784-6. In the following century it was enlarged (218/833)

and the decoration of the west door was completed in 241–2/855–6. During the fourth/tenth century a new minaret was built, further enlargements were carried out and the decoration of the *miḥrāb* was completed. The mosque is a vast rectangle with a deep covered sanctuary which is divided into nineteen aisles by eighteen arcades. The beauty of the mosque is in the construction of these arcades which have double-tier horse-shoe arches, and in the colourful decoration of its *miḥrāb* [pl. 8(*a*)]. Marble and gold mosaics were used for its lining. The niche itself is seven-sided and is very spacious. The upper part of the niche is decorated by seven trefoil arches. This *miḥrāb* served as a model for other *miḥrābs* in North Africa and Spain.

One of the earliest mosques in North Africa was built at Qayrawān in Tunisia. The original mosque was built in the Umayyad era, but it was demolished, rebuilt and enlarged several times, until Ziyādat Allāh I in 221–2/836 rebuilt the whole structure. It has been preserved in that form up to the present day. It is a great irregular enclosure with eight doorways and a minaret in the middle of the north side. The sanctuary is a deep covered hall of seventeen aisles. The *miḥrāb* has a horseshoe form and, like that of Cordova, is richly decorated. The walls around the niche are coated with polychromed lustre tiles imported from Mesopotamia, while the niche itself is lined by pierced marble panels and the semi-dome has wooden panelling. There is a richly carved wooden *minbar* in the mosque which also dates from the third/ninth century.

## THE PRE-SELJUK PERIOD OF PERSIA AND CENTRAL ASIA

During the third/ninth century the power of the 'Abbasid caliphs started to decline rapidly. Petty dynasties sprang up all over the empire. In the east the most significant among these dynasties were the Samanids (261–389/874–999), who ruled over Transoxania and eastern Persia. They became patrons of the arts. Their capital was at Bukhārā, where one of their earliest surviving monuments was erected: the mausoleum of Ismā'īl, completed in 295/907.

The mausoleum is a square structure covered by a hemispherical dome. It is as beautiful and perfect as a jewel-box. It was built and decorated entirely of fired bricks, thus being the earliest known building where the decorative brick technique, called *hazārbāf* in Persian, was applied. The mausoleum actually owes its plan to Sasanian architecture. Sasanian fire-altars with their square structures and hemispherical

domes served as a model for domed mausoleums of the Islamic period. The plan presented an architectural problem; the transition from square to circle. The earliest successful solution to this problem is known from the fire-altar of Ribāṭ-i Safīd (third Christian century). The problem was solved by the introduction of a series of squinches in the zone of transition.

In the Samanid mausoleum at Bukhārā the zone of transition appears in an elaborated and decorated form [pl. 8(*b*)]. A more complicated zone of transition appears in the recently discovered mausoleum of 'Arab Ata at Tim in Soviet Uzbekistan. The building, which is again square and has a decorated façade, is dated to 367/977–8. In the zone of transition the square squinches were applied in a trefoil form [pl. 9(*a*)]. Previously the earliest of such trefoil squinches were known from the Davāzdah Imām at Yazd, dating from 429/1037.

Excavations by Soviet archaeologists in Samarqand and Afrāsiyāb, and by the Metropolitan Museum at Nīshāpūr, exposed an interesting type of pottery. First it was called Samanid slip-painted ware, or East Persian ware. The decoration is painted with coloured slip under transparent glazes. The body is usually red and has a white, creamy or brownish ground slip. The colours used for decoration were mainly manganese-purple, yellow, tomato-red and green. Kufic inscriptions, stylized birds and floral patterns appear on these vessels, which can be dated to the tenth and early eleventh Christian centuries [pl. 6(*d*)].

There is an early mosque in central Persia, the Masjid-i Jāmi' of Nā'īn, which deserves special attention. The date of the building is not known, but on stylistic ground it is considered to be the second half of the fourth/tenth century. The mosque has a rectangular courtyard surrounded by porticoes, which are deeper on the sanctuary side. There is a small, tapering minaret in one corner. The *miḥrāb* and the surrounding area are coated with richly carved stucco [pl. 9(*b*)], displaying, according to Upham Pope, 'the implicit theme of the age-old concept of fertility'.[1]

In north-east Persia, not far from the Caspian Sea, is the small village of Gunbad-i Qābūs, where, previous to the Mongol invasion, there stood the town of Jurjān. It was here that the earliest Islamic tomb-tower was erected by Qābūs b. Wushmgīr in 347/1006–7. It is a high, cylindrical, slightly tapering tower, capped with a conical top, built

[1] A. U. Pope, *Persian architecture* (London, 1965), 86.

entirely of fired bricks. The sole decoration of the tower is the Kufic inscription which runs around the building above the entrance and below the roof.

A few caravanserais have survived from that period in eastern Persia and Central Asia. The earliest known, that at Āhuwān, near Simnān, dates from 420–41/1029–49. These caravanserais have strong enclosure walls, usually strengthened by buttresses. Inside there are four great *īwāns*[1] opening on to a central court. This cruciform plan with the four *īwāns* goes back to Parthian times, where it first appeared in the palace at Assur (first Christian century).

Meanwhile another dynasty appeared further east, in present-day Afghanistan, the Ghaznavids (351–582/962–1186). The greatest ruler of the dynasty, Maḥmūd (388–421/998–1030), had his capital, Ghazna, near the Indian frontier. Only two polygonal towers survive from this capital. Further south-west, at Lashkar-i Bāzār, palaces and mosques were excavated by the French Archaeological Mission, exposing frescoes, stuccoes and similar slip-painted pottery which were already known from the Samanid period.

The minaret of Jām, in northern Afghanistan, should also be mentioned here, though it is somewhat later in date. It was erected by the Ghurid Ghiyāth al-Dīn Muḥammad between 548/1153 and 599/1203. The minaret has a very fine decoration in stucco, containing Qur'anic and historical inscriptions. The minaret, which was discovered only in 1957, clearly shows its connexion with the Quṭb Mīnār in Delhi, erected in the seventh/thirteenth century.

## THE FATIMID PERIOD

The Fatimids came to power in Tunisia and founded their capital Mahdiyya with its Great Mosque. This mosque has the first example of a monumental entrance, recalling in appearance some of the Roman triumphal arches. Later on, in 356/969 the Fatimids conquered Egypt and founded Cairo. Their adherence to Shi'ism marked their religious and political differences with the 'Abbasid caliphs of Baghdād.

The Fatimids erected several buildings in Cairo, among which the mosque of al-Azhar is the most outstanding example. The original mosque was nearly square in plan, with five aisles in the sanctuary

[1] *Īwān* in Islamic architecture means a portal or a hall, which is usually enclosed on three sides and is roofed by a barrel vault.

running parallel to the *qibla* wall. There were three domes, one in front of the *miḥrāb*, and two more at either end of the *qibla* wall. Later on there were several additions and alterations made in the mosque, and today it looks like a labyrinth. Some of the original stucco decorations in the sanctuary, and a number of window grilles have survived up to the present day [pl. 10(*a*)].

Another Fatimid mosque in Cairo is that of al-Ḥākim, erected between 380/990 and 394/1003. Later on it became the Friday Mosque of the city. It is an immense square building, recalling the mosque of Ibn Ṭūlūn with its arcades supported by brick piers. It also resembles the mosque of al-Azhar with its three domes in the sanctuary. There are two minarets at the corners of the main façade. The decoration of the sanctuary contains a band of beautiful floriated Kufic inscription running the length of the arcades.

Badr al-Jamālī, the commander-in-chief and *wazīr* (466–87/1074–94), rebuilt the walls of the city by replacing the former mud-brick walls with excellent stone masonry, and strengthened them with towers. He also built three monumental gateways: Bāb al-Naṣr which has two great square towers and a beautiful semicircular arch; Bāb al-Futūḥ, where the archway is again flanked by two solid towers; and Bāb Zuwayla, very similar to that of Bāb al-Futūḥ. All three gateways reveal the strong North African influence which is obvious throughout the Fatimid period. This period also witnessed the introduction of a new kind of structure, the *zāwiya* or domed mausoleum with three bays.

The little covered mosque of al-Juyūshī dates from the end of the fifth/eleventh century. It has a remarkable *miḥrāb*, one of the finest stucco works in Egypt [pl. 11]. The mosque of al-Aqmar was built in 519/1125. Its façade is very impressive, with two niches flanking the entrance. The niche-heads are decorated with stalactites or *muqarnas*.

Nothing has survived of Fatimid secular buildings. It is known, however, from literary sources that the Fatimids erected a palace in Cairo. A number of wooden panels from this palace are preserved in the Museum of Islamic Art in Cairo. They show human figures: musicians, dancers, animals and birds against a dense scroll background. In the same Museum there are also a few wooden *miḥrābs* demonstrating the great skill of Fatimid artists in this field.

The potter's art flourished throughout the period, and lustre wares in particular are worth mentioning. At the beginning the same naïvely

drawn human figures and animals were represented, like those on Mesopotamian forerunners in the early fourth/tenth century. Later examples, however, reveal great progress in rendering the figures and also in their selection of subjects. Episodes from everyday life appear frequently on dishes and bowls [pl. 12(*a*)]. A number of vessels are signed by the potters, and among them the name of Sa'd appears very often. This potter seems to have been very active at the end of the fifth/eleventh and beginning of the sixth/twelfth century.

Apart from lustre wares, splashed and monochrome, glazed vessels were also produced, probably in Fusṭāṭ and the Fayyūm.

Very little is known of Fatimid metalwork. A small number of engraved vessels, zoomorphic aquamaniles and incense-burners, are attributed with more or less certainty to the period. These are in the Museum of Islamic art in Cairo and in the Benaki Museum of Athens.

The earliest known Islamic paintings on papyri were found at Fusṭāṭ and in the Fayyūm region of Egypt, dating from the fifth/eleventh and sixth/twelfth centuries. Apparently a lively school of painting functioned in the Fayyūm under the Fatimids, as is mentioned by a later Egyptian writer.[1] Very few of these paintings have survived, and these are mostly in Cairo. There is one such painting in the British Museum showing the siege of a fortress, most likely representing a fight between Muslims and Crusaders [pl. 12(*b*)]. It probably dates from the second half of the sixth/twelfth century.

Fatimid painting can be observed on the ceiling of the Capella Palatina of Palermo which was executed by Egyptian painters around 535/1140. The enthroned monarch, musicians, dancers, slave girls and fantastic animals painted on the ceiling clearly resemble the decorations of the lustre-painted vessels or wall frescoes of Sāmarrā, which in turn can be traced back to Central Asia.

The earliest known Islamic textiles are the so-called *ṭirāz* bands which contain inscriptions in beautiful Kufic. These were produced in Egypt, where Tinnis (near Port Said), Damietta and Alexandria were the main centres in the Tulunid and Fatimid era. There are also *ṭirāz* bands decorated in polychrome wool, and lined or embroidered in silk. The Fatimid era produced the finest silk and linen the decoration of which continued the scheme of earlier examples: a broad inscription band followed by narrow fields of animal figures and arabesques.

[1] Al-Maqrīzī, *Khiṭaṭ*, I, 486–7; II, 318. Al-Maqrīzī also wrote a book on the history of painters, which has unfortunately not survived.

## THE SELJUKS IN PERSIA, 'IRĀQ AND ANATOLIA

The Seljuk period is frequently called the 'Persian Renaissance'. Architecture and decorative arts certainly reached a very high apex in their development, but this does not apply only to Persia. The Seljuks, who extended their domination over 'Irāq and parts of Anatolia, greatly affected the development of arts in these two regions as well. In architecture the period witnessed the perfection of decoration in brick technique. Several ways of brick bondings were invented or further developed.

The earliest monuments of the period, like the recently discovered tomb-tower in Damāvand, express both the power and grace of the brick technique. The Damāvand tomb-tower [pl. 13], which can be dated to the third quarter of the eleventh Christian century, reveals a great variety of designs, all executed in brick. There is an early sixth/twelfth century tomb-tower at Melik Ghāzī, east of Kayseri in Turkey, the decoration of which, but particularly the herringbone patterns of the dome, comes very close to the Damāvand tomb-tower.

Two more tomb-towers were also discovered recently in Persia, not far from the Qazvīn–Hamadān road. Both of these are octagonal buildings capped by double domes [pl. 10 (*b*)]. They reveal the finest brick decoration of the period. According to their inscriptions, they were erected in 460/1067–8 and 486/1093 respectively.

In mosque architecture, a great number of surviving monuments bear witness to Seljuk activity. In Persia the dome over the northern *īwān* in the Masjid-i Jāmi' of Iṣfahān, which dates from 480/1088 should be mentioned. The zone of transition here again has trefoil squinches. The Masjid-i Jāmi' of Iṣfahān is actually a four-*īwān* building. Other Seljuk mosques in Persia were erected in the same style. In Ardistān, the zone of transition below the dome in the *jāmi'* indicates a further development. Within the trefoil squinch appear four niches with pointed arches resting on engaged columns [pl. 14(*a*)]. That trend had actually begun in Iṣfahān in the Masjid-i Jāmi', a hundred years earlier.

Decoration in stucco also reached its apex under the Seljuks. Entire wall surfaces were coated with carved stucco, revealing not only a variety of patterns, but also ingenious application of the design in a number of superimposed layers. In this respect first of all two Seljuk monuments should be referred to: the Madrasa Ḥaydariyya in Qazvīn,

and the Gunbad-i 'Alawiyyān in Hamadān [pl. 14(*b*)]. In both buildings the *miḥrāb* and the surrounding areas, the cornice and the zone of transition in part, are decorated in very dense stucco. The richness of the design reminds us of the exaggerations and wildness of the rococo. In Hamadān the façade is also coated with carved stucco, and there is an inscription which runs round the square building.

The Masjid-i Kūchī Mīr in Naṭanz has an entirely different ground-plan. Instead of the cruciform plan with four *īwāns*, it is completely roofed with a small dome in front of the *miḥrāb*. It is one of the earliest known completely roofed mosques in Persia. The actual date of the mosque is not known, but it is considered to be of the sixth/twelfth century. While the building is quite simple and unadorned, its *miḥrāb* [pl. 15(*a*)] is coated with carved stucco. Two small rectangular recesses are set in a rectangular frame. The columns, capitals, spandrels and the back panel of the inner or lower recess are decorated in the Seljuk style.

A great number of Seljuk minarets survive in Persia. All these are tall, round, tapering towers decorated in brick technique. On rare occasions, glazed brick or tiles were used for the decoration of inscriptions or other horizontal patterns. Such a minaret exists in Nigār, south of Kirmān.

Very little is known of Seljuk secular architecture in Persia. So far no palace has been found. There is a Seljuk bath in Nigār, but even that has been drastically altered on several occasions. A few caravanserais are known from the period, among them the most interesting is Ribāṭ-i Malik in eastern Persia, dating from 471/1078. The enclosure walls are of massive bricks, strengthened one side by a row of cylindrical piers which are connected to each other by arches above. Another caravanserai, again in eastern Persia, close to the Afghan frontier, is the Ribāṭ-i Sharīf built by Sultan Sanjar in 447/1055. Inside it has an extensive stucco decoration, including a stucco *miḥrāb* within the mosque.

Seljuk building activity in the Fertile Crescent was associated with the name of Nūr al-Dīn (541–69/1146–73). He ordered the erection of a number of *madrasas*, and was also responsible for the Great Mosque in Mosul. It is better known as the Jāmi' al-Nūrī. Only the sanctuary and the minaret have survived in their original form. The cylindrical minaret has a cubical base [pl. 15(*b*)], and the cylindrical part is divided into seven equal horizontal fields all of which are decorated in different brick designs.

Though the Seljuk empire began to decline in the middle of the sixth/twelfth century, and a number of petty dynasties shared its realm, the vigorous and lively trend and style in art and architecture continued in Persia up to the Mongol invasion in the early seventh/thirteenth century, while in Anatolia it continued until about 700/1300. A great number of Seljuk monuments have survived in Anatolia, particularly in Konya and Kayseri.

Seljuk mosques in Anatolia are different from those of Persia or Mesopotamia. Since they had to be suited to a more severe climate, they were completely roofed. Thus the courtyard disappeared, and was replaced by a large central dome with a fountain beneath. One of the earliest of these Seljuk mosques in Anatolia was erected in Silvan (ancient Mayyāfāriqīn, east of Diyār Bakr), dating from the fourth/eleventh century. Here the zone of transition was formed by stalactites.

The basic element of the stalactite is a quarter dome, unsupported above and applied in several rows. Its origin is still ambiguous, but as far as is known today, the earliest examples are found in Central Asia, dating from the third/ninth and fourth/tenth centuries. From the fifth/eleventh century onwards they were widely used nearly everywhere in Islamic architecture.

Another early Seljuk mosque is in Kızıltepe (ancient Dunaysir, west of Mardin). It is in a ruinous state, and the dome collapsed some time ago. The mosque has a richly carved stone *miḥrāb*. It should be noted here that in Anatolia the building material was stone, while bricks, both fired and unfired, were used in Persia.

The most beautiful of the Seljuk monuments is the Ulu Jāmi' and annexed hospital in Divrighi, in central Anatolia. It is without any doubt the masterpiece of Seljuk workmanship. Whatever beauty was achieved in stucco in Persia, appeared in stone at Divrighi. The main entrance of the building [pl. 16(*a*)] displays a great variety of Seljuk patterns, appearing as if it were in a number of superimposed layers.

Another richly carved portal is that of the Inje Mināre in Konya, which was built in 657/1258. It is actually a *medrese*. *Medreses* in Anatolia are different from those of Persia. There are in fact two different types. The first type has an open court with a large *īwān* opposite the entrance. Sometimes even four *īwāns* appear, just as in Persia. The second type is similar to Anatolian Seljuk mosques, that is a small covered building with a central dome and a fountain placed below. *Medreses* in general had minarets, richly decorated either in bricks, or,

as an addition, glazed bricks and tiles, which were used for horizontal panels and inscriptions.

The technique of covering large surfaces with glazed tiles was actually a Seljuk innovation. It first appeared on mausoleums at Marāgha in western Persia. In Seljuk Anatolia they were frequently used, particularly for decorating *miḥrābs*. The earliest known examples of these faience *miḥrābs* are in Konya in the 'Alā' al-Dīn Jāmi' (618/1221), Sirjeli Medrese (640/1242), and Laranda Jāmi' and Ṣaḥib Ata Jāmi', both dating from 656/1258. Among the later examples are those of the 'Alaja Jāmi' at Kharput (672/1273), in the Eshrefoghlu Jāmi' at Beyshehir (697–8/1297–8), and probably the most colourful faience *miḥrāb* is in the Arslankhāne Jāmi' of Ankara [pl. 16(*b*)] dating from 688–9/1289–90.

Mausoleums in Anatolia followed the Persian tradition. These were built mainly in stone. Their ground plan varied from octagonal, polygonal to square. One Anatolian mausoleum with a square form, has already been mentioned; that of Melik Ghāzī, on the Kayseri–Malaṭya road. A number of mausoleums survived in Kayseri, among which the Döner Gümbet (675/1276) is probably the most decorative.

The Seljuks built up an entire network of caravanserais. The number of surviving Seljuk caravanserais in Anatolia is even greater than in Persia. Their ground-plan closely follows the Persian models, but here the building material was stone, and they were more richly decorated. The earliest examples are around Konya, such as the Altınapa (598/1201), and the Kızılören khans (601/1204) on the Konya-Beyshehir road. The most famous caravanserai is probably Sulṭān Khān on the Kayseri–Sivas road, dating from 634/1236.

A number of bridges are also known from the period. These were sometimes used for frontier customs or tolls. The finest example of a Seljuk bridge is the Shahristān bridge in Persia which spanned the Zāyanda Rūd river near Iṣfahān. In Anatoliā, the bridge over the Kızılırmak, near Kirshehir, is a monument to the ingenuity of Seljuk engineers.

The Seljuk period was a golden age for decorative arts, particularly for pottery. Previous to the Seljuk invasion, about the beginning of the fifth/eleventh century, new pottery centres sprang up in the northern and north-western mountainous parts of Persia, in the Caspian borderland, in Āẕarbāyjān and Kurdistān. The significance of these kilns in these parts is outstanding, since their products greatly differed from other

Islamic wares. They reveal a strong Sasanian influence. Though the Arabs conquered the Sasanian empire, Sasanian traditions and Zoroastrianism nevertheless lingered, particularly in more remote areas of the country. One of the strongholds of Sasanian and Zoroastrian traditions centred around Ṭabaristān, which was long ruled by native princes.

It was in this part of Persia that pottery making was taken up soon after the decline in Samarqand and Nīshāpūr. These local potters developed special wares of the incised so-called *sgraffiato* technique. It was actually the pottery equivalent of the engraving in metalwork, frequently used in Sasanian metalwork. Even some of the designs were borrowed from Sasanian metalwork, such as the stylized bird in a bowl, which is in the Ashmolean Museum, Oxford [pl. 17(*a*)]. There are three different types of *sgraffiato* wares, which are dated to the fifth–seventh/eleventh–thirteenth centuries.

The coming of the Seljuks brought about great changes in Islamic pottery. First of all, a new white composite material was introduced, and was henceforward used in all parts of the Near and Middle East. Secondly there was a gradual evolution in the methods of decorating the white material by carving, staining the glaze, painting under the glaze, and painting in lustre and polychrome over the glaze.

The wide range of Seljuk pottery starts with monochrome-glazed wares. The glaze might be white, or coloured in different shades of green, turquoise blue, aubergine, purple and brown. The body was very fine and thin. Actually this was an attempt to imitate Chinese porcelains and celadon. Muslim potters of Persia, 'Irāq and Anatolia produced a variety of finely executed bowls, jugs, ewers, vases and tankards. Occasionally these vessels are so thin that they seem translucent, an impression which is further enhanced by working pierced openwork into them. The jug shown in pl. 17(*b*) was executed in the same way. The field around the moulded inscription was pierced, and the small holes were filled with the glaze which then produced tiny windows giving the impression of glass.

The decoration of these monochromed wares consisted of floral patterns, inscriptions in *naskhī* script or human figures, which had been carved, moulded or incised into the body before the glazing took place. The date of these fine Seljuk wares is considered to be sixth–seventh/twelfth–thirteenth centuries. The main production centres in Persia were Rayy and Kāshān; in Syria, Raqqa and Ruṣāfa. The same types were also produced in several parts of Anatolia.

A further development in the decoration of pottery was the painting in blue, black and turquoise, under a clear glaze of transparent turquoise or deep blue. Underglaze-painting was again a practice which was introduced under the Seljuks but was quickly accepted all over the Middle East.

Lustre painting was also introduced into Persia. Its appearance coincides with the fall of the Fatimids in Egypt. The greatest change in these medieval lustre wares from those of the early period is that while on the earlier examples the decoration was painted in lustres, it is now the background which is lustred in deep brownish or yellow, thus leaving the space open for the decoration. A number of important centres are known to have been producing lustre wares during the second half of the sixth/twelfth century and during the seventh/thirteenth century. Among them Rayy, Kāshān, Sāva and Raqqa should be mentioned. A beautiful large dish (diameter 18½ inches) comes from Rayy, and probably dates from the sixth/twelfth or early seventh/thirteenth century [pl. 17(*c*)]. Human and animal figures, depicted on a floral background, are the favourite subjects.

The last phase of development in pottery decorations was that of painting in polychrome over the glaze. Two kinds of techniques were used: *mīnā'ī* and *lajvardina*. The so-called *mīnā'ī*, meaning enamel, denotes a technique in which the colours are usually blue, green, brown, black, dull red, white and gold, and are painted over an opaque white ground under transparent colourless or turquoise glaze. There was a close connexion between *mīnā'ī* wares and miniature painting, and most likely the decorations were executed by painters. The designs display court-scenes or scenes from Persian legends. A *mīnā'ī* bowl here depicts the meeting of two horsemen under a tree. An inscription outside gives the date of the vessel as 583/1187. It was probably made in Rayy [pl. 17(*d*)].

The other overglaze painted technique, the *lajvardina*, took its name from the cobalt-blue glaze on which the decoration was painted in red and white, and leaf gilding was added. The production of *lajvardina* wares is considered to have taken place in the Sulṭānābād region of Persia.

In metalwork the Seljuk period also brought about a considerable change. Previously, metal vessels in Persia, which was the cradle of Islamic metalwork, appeared as a straight continuation of Sasanian metalwork. Silver dishes, bowls and ewers displayed the same orna-

ments for another three or four hundred years. On some specimens, however, Kufic inscriptions were added. On ewers the decoration was engraved. As a general trend necks and spouts, or even whole vessels, followed the form of birds or animals. Aquamaniles and incense-burners in zoomorphic forms, are known from the third/ninth to the sixth/twelfth century.

A new technique, inlaying in bronze or brass with silver, copper or gold, was introduced during the sixth/twelfth century. The earliest piece of inlaid metalwork known today is a pen-box made in Herat by 'Umar b. al-Faẓl and dated 542/1148. The next inlaid object in chronological order is a large bucket made of bronze and inlaid in silver and copper [pl. 18(*a*)] also made at Herat and signed by the caster, Muḥammad b. 'Abd al-Wāḥid, and by the inlayer, Mas'ūd b. Aḥmad, and dated 559/1163. Both objects are in the Hermitage Museum of Leningrad.

The elaborate inlaid decorations of the bucket are disposed in five registers, out of which three contain inscriptions, while the other two present festive court and hunting scenes. The Kufic inscription deserves special attention. The vertical strokes of the letters end in human and animal heads. This is known as 'animated inscription', common in Islamic metalwork from the end of the seventh/thirteenth century.

There are a great number of ewers, candlesticks, boxes, incense-burners and buckets preserved in public and private collections, dating from the late sixth/twelfth century or early seventh/thirteenth century, decorated in the inlay technique and most likely originating from Khurāsān and Herat.

The approach of the Mongols uprooted these craftsmen, and some of them set up their workshops in Mosul in Mesopotamia. Not long ago, all fine inlaid metalwork was designated as a product of Mosul. But in fact there are only a few specimens which can be attributed to Mosul without any doubt. Among them is a very fine brass ewer signed by a certain Shujā' b. Mana' of Mosul, dated 629/1232 [pl. 18(*b*)]. The medallions depict scenes from Persian legends. The T-fret and swastika patterns among the polylobed medallions and the elaborate star rosettes are characteristic of the new Mosul style.

There was a school of miniature painters in Mesopotamia and Syria during the seventh/thirteenth century. In Mesopotamia, these schools were probably in Baghdād and in Mosul. A number of illuminated manuscripts are preserved from that period, among them the Arabic translation of Dioscorides's *Materia medica*, dating from 621/1224. The

paintings of the manuscript reveal the powerful influence of Byzantine art [pl. 19(*a*)].

Among the earliest manuscripts is the *Kalīla wa-Dimna*, a collection of fables about animals. More important, however, are the copies of the *Maqāmāt* of al-Ḥarīrī, which recall the adventures of Abū Zayd. The illustrations give us glimpses of contemporary Arab life. They are not related to Byzantine paintings, figures and all elements being presented in a true Arabic manner [pl. 19(*b*)].

In connexion with painting, calligraphy should be mentioned, as it played an important role in Islamic art. There were two main styles in calligraphy: the angular Kufic and the cursive *naskhī*. Kufic [pl. 20(*a*) (i)], which is alleged to have been invented at Kūfa, was used during the first four or five centuries of Islam. It appears in architecture,tombstones, early Qur'āns, on pottery and in textiles. Foliated Kufic [pl. 20(*a*) (ii)] was a more advanced form, decorating the endings of vertical strokes in lobed leaves or half-palmettes. The floriated Kufic [pl. 20(*a*) (iii)] developed in Egypt and reached its apex under the Fatimids.

*Naskhī* [pl. 20(*a*) (iv)] was developed in Baghdād, and from the fifth/eleventh century onwards gradually replaced Kufic. In Persia and Anatolia several cursive styles were developed in subsequent centuries, among which *thuluth* [pl. 20(*a*) (v)] should be mentioned. In this style, certain elements, such as the vertical strokes and horizontal lines, are exaggerated. From the second half of the fourteenth century the elegant *nasta'līq* becomes the predominant style in Persian calligraphy [pl. 20(*a*) (vi)].

Carpet weaving was also practised during the Seljuk period, as is attested by a few carpets discovered in the 'Alā al-Dīn Jāmi' of Konya and in the Eshrefoghlu Jāmi' of Beyshehir. Later on more carpet fragments turned up in Fusṭāṭ which betray a close relationship with their Anatolian counterparts. These Seljuk carpets, which are coloured in two shades of blue, green, red and yellow, reveal geometric designs in their central parts and mostly Kufic characters in the borders [pl. 20(*b*)]. The origin of carpet-making must be sought in Central Asia, where they were woven by Turkish nomads who then brought the technique with them to the Middle East.

### THE AYYUBID PERIOD

Though the Ayyubids were preoccupied with military campaigns against the Crusaders, they made an important contribution to Islamic

architecture and the decorative arts. In architecture, solid stone buildings, expressing strength and durability, are the most characteristic. A unique example is the citadel of Aleppo. Its history goes back to pre-Islamic times, [pl. 21(*a*)]. Saladin, the first Ayyubid ruler, further strengthened the walls of Cairo and erected the citadel on the Muqaṭṭam. He was responsible for the erection of a number of *madrasas* in Damascus and for their introduction into Egypt. These *madrasas* are, however, different from Persian examples, as they have only two *īwāns* instead of the usual four. The most famous *madrasa* in Cairo is that of the Sultan al-Ṣāliḥ Ayyūb built between 640–2/1242–4. It has four *īwāns*, but they are arranged in two separate blocks connected by the archway of the entrance, which at the same time carries a beautiful minaret.

A large number of mausoleums (Arabic sing., *qubba*) were also erected in Damascus and in Cairo, of which quite a number have survived. In Cairo two should be particularly mentioned: that of Shajar al-Durr (648/1250), and the mausoleum and mosque of the *Imām* al-Shāfi'ī, erected in 608/1211. Stucco played an important role in the decoration of Ayyubid mausoleums as is attested by the richly carved stucco *miḥrāb* of the mausoleum of Shajar al-Durr.

The marble decoration of the mosque and mausoleum of the *Imām* al-Shāfi'ī dates from the Mamluk period, but its wooden cenotaph is a very fine example of Ayyubid woodwork. It is decorated with finely carved scrolls and inscriptions placed on a dense scroll background [pl. 21(*b*)].

In metalwork the inlaid tradition of Mosul continued with slight alterations in the style. This was of course due to the migration of Mosul artists to Syria and Egypt. Candlesticks, large basins and incense-burners are known from this period, some of them decorated with Christian scenes. A bronze canteen in the Freer Gallery of Art in Washington is a unique piece of work of a Syrian artist or artists. Among the Christian scenes one represents Christ's entry into Jerusalem [pl. 22(*a*)]. Obviously the scene was borrowed from contemporary miniature paintings. It also seems very probable that most of these objects with Christian scenes were made for Christians, or even that some of the artists themselves must have been Christians.

In pottery, partly Fatimid, partly Persian Seljuk types, were followed. Lustre was produced in Syria. Wares which were underglaze-painted in polychrome, copying Persian *mīnā'ī* ware, decorated with human and animal figures, were made in Ruṣāfa and Damascus. Painted tiles have

survived from the period in some of the Damascus mosques. Their decoration is in blue, black and green under a transparent colourless glaze. Ivory and bone carving was also practised both in Egypt and Syria, and reached a very high standard.

## SPAIN AND NORTH AFRICA IN MEDIEVAL TIMES

The golden age of Muslim rule in Spain came in the reign of 'Abd al-Raḥmān III (300–50/912–951), who founded the new capital, Madīnat al-Zahrā' near Cordova. A great variety of limestone and marble fragments disclose the strong connexion which still existed between Spanish Umayyad architecture and that of the second/eighth and third/ninth centuries in the eastern half of the Islamic world.

In the first half of the sixth/twelfth century the Almoravid 'Alī b. Yūsuf ordered the enlargement of the mosque of the Qarawiyyīn at Fez, and the decoration of the Great Mosque at Tlemcen. The Almohads, who succeeded the Almoravids in North Africa, founded a new capital, Tinmāl, in the High Atlas in southern Morocco, and erected there a congregational mosque in 548/1153. This is now in ruins, but its *miḥrāb* is still preserved in good condition. The Kutubiyya mosque at Marrakesh, particularly its *miḥrāb*, resembles that of Tinmāl. The minaret is square, like most minarets in North Africa and Spain. The second largest mosque in Islam, the Mosque of Ḥassān (the Great Mosque of Sāmarrā being the first) was erected in Rabat. It also has a square minaret, opposite the sanctuary [pl. 22(*b*)]. The building is in ruins now. Only the minaret, bases of columns and the enclosure-walls survive. In Spain the Great Mosque of Seville is an Almohad building. Its minaret, the famous Giralda, was completed in 591/1195.

The best-known Islamic structure in the Western countries of the Islamic world is of course the celebrated Alhambra at Granada, erected by the Nasrid, Muḥammad b. Yūsuf. It was completed in its present form in the early eighth/fourteenth century. The palace, which is in the citadel, comprises two complexes, each surrounding a central court [pl. 23(*a*)].

Qal'at Banī Ḥammād in Algeria was the capital of the Hammadid dynasty for nearly one hundred and fifty years. It was founded in 398/1007–8, and destroyed by the Almohads in 547/1152. Excavations there have revealed a number of palaces. There is also a mosque with a

surviving square minaret. Glass and pottery kilns were also uncovered in the course of the recent excavations.

North African and Spanish architecture differs from that of the rest of the Islamic world, yet it seems to be a direct descendant of the earlier Umayyad art in Syria. The horseshoe arch, which originated in Syria, played an important role. After the early second/eighth century it disappeared from Syria and reappeared in the Maghrib, and also at the other extreme of the Islamic world, in Afghanistan. In stucco carvings, the minute and accurate workmanship and the extensive use of the stalactite reached a very high standard.

Pottery is known to have been produced in Spain from early Islamic times. The earliest specimens were excavated in Cordova and at Madīnat al-Zahrā'. Much more is known about later Hispano-Moresque pottery, dating from the ninth/fifteenth and tenth/sixteenth centuries. Potters, even after the Christian reconquest of Spain, continued to decorate their vessels in Moorish style. The pottery centres of Paterna, Málaga and Manisa produced golden and ruby lustre vessels, large dishes, bowls and vases, sometimes adding blue to the decoration. Kufic letters, arabesques and scrolls were the favourite designs. By the late sixteenth century the Moorish style had gradually disappeared and pottery-making had gradually slipped into the hands of Christian artists.

Textiles made in Muslim Spain are also worth mentioning. Almería, Granada, Málaga, Murcia and Seville were the main textile-producing centres, making tapestry-woven bands, silks and golden brocades displaying human figures and animals, usually placed in round medallions. Textile designs were similar to those of ivory carvings. Ivory carving played an important role in Andalusian art and reached a very high standard under the Umayyad rulers. A large number of ivory boxes have survived and can be seen in various public and private collections. The Victoria and Albert Museum possesses a few Moorish ivory carvings which are decorated with vine scrolls, palmettes, human and animal figures and Kufic inscriptions.

Moorish metalwork greatly resembles that of the eastern Islamic world, and uses the same techniques. A great number of engraved and inlaid vessels are preserved in Spanish collections, mostly dating from the tenth to the fourteenth centuries.

Very little is known of Maghribī and Andalusian paintings. A famous seventh/thirteenth-century manuscript, containing the love story of

Bayāḍ and Riyāḍ was illustrated in Ceuta in Morocco. Though the actual story takes place in 'Irāq, the architectural elements depict Maghribī forms. In calligraphy the Maghribī style was quite distinct from the rest of the Islamic world by reason of the round forms of the letters and the placing of the dot under the *fā'*.

## PERSIA AFTER THE MONGOL INVASION: ĪL-KHĀNS AND TIMURIDS

The Seljuk period was a golden age for art and architecture in Persia. It was followed by a brief rule of the Khwārazm-Shāhs and by the disaster caused by the successive Mongol invasions during the first half of the seventh/thirteenth century. Recovery from the Mongol devastation was very slow. Some cities, such as Rayy, a former centre of pottery and textile industry, never regained their previous vitality. But the recovery was initiated by a Mongol dynasty, the Īl-Khāns, who later embraced Islam. From their capital at Tabrīz they encouraged artisans and builders to heal the severe wounds caused by their predecessors.

It was Hülegü, the captor and destroyer of Baghdād, who made Tabrīz his capital, and was also responsible for the erection of an observatory in Marāgha. His architect was al-'Urdī, an engineer and astronomer. The real recovery and building activity, however, started under Ghāzān Khān, who became the ruler of the Il-Khanid empire in 694/1295. After his death in 703/1304 his brother, Öljeitü, continued his work. Rashīd al-Dīn, the famous historian, was their contemporary and their minister.

Öljeitü ordered the erection of a new capital, Sulṭāniyya, south of Tabrīz, in 706/1306. Mosques, palaces and a citadel were erected there. The only surviving building today is his own mausoleum. It is an octagonal building partially coated with faience bricks inside and outside. The platform outside carries the huge dome and eight small minarets above each corner. The building today is partially ruined.

Öljeitü was also responsible for the erection of a very fine stucco *miḥrāb* in a prayer-hall in the Masjid-i Jāmi' of Iṣfahān. According to the inscription it was completed in 710/1310. The stucco decoration is arranged in several layers above each other, just as those of the Seljuk period. The details of the design, however, differ from those earlier examples.

The Masjid-i Jāmi' of Tabrīz, better known as the Masjid-i 'Alī

Shāh, with its massive walls, looks rather like a fortress or a citadel. It was erected by Tāj al-Dīn 'Alī Shāh, Öljeitü's *wazīr*, and the rival of Rashīd al-Dīn, between 710/1310 and 720/1320. The building is in ruins to-day. The existing ruins are parts of the *qibla īwān*. There is no sign of any decoration today, but contemporary sources mention a faience-tiled lustre *miḥrāb*.

The most interesting and probably the best preserved monument of the Il-Khanid period is the Masjid-i Jāmi' complex in Naṭanz, in central Persia, east of Iṣfahān. It was built between 704/1304 and 725/1325. The mosque is of the four-*īwān* type with an octagonal dome and a tall slender minaret, partly decorated with enamelled bricks [pl. 23(*b*)]. The building has a faience-tiled portal. The original *miḥrāb* was of faience-lustred tiles. Parts of this are now in the Victoria and Albert Museum.

Faience-tiled lustre *miḥrābs* were made in Kāshān during the second half of the seventh/thirteenth and at the beginning of the eighth/fourteenth centuries. While pottery production came to a halt in Rayy after the Mongol destruction, Kāshān, it seems, quickly recovered. Underglaze-painted and lustre-painted wares were produced there until the end of the eighth/fourteenth century.

New pottery centres emerged in the Sulṭānābād region. Here the main type was the underglaze-painted ware, using grey as the main colour for the background, reserving the designs in white or blue, sometimes in relief. Far Eastern elements are apparent in Sulṭānābād wares.

Large dishes and bowls are known from the eighth/fourteenth and ninth/fifteenth centuries painted in heavy green or purple lines, frequently with cross-hatchings. These are considered as rustic wares. Their actual provenance has not yet been identified.

A more important group of the period is the Persian blue and white, which was produced in Kirmān and Mashhad. It was previously thought that blue and whites were first made in China. Recent research, however, has established that their origin should be sought in Persia. In fact the cobalt ore which was used for the decoration of Chinese blue and whites was imported from Persia. Very little is known of early Persian blue and whites, and no piece can be confidently dated to the eighth/fourteenth century. From the ninth/fifteenth century a number of small bowls are known. Their shapes resemble those of Chinese rice-bowls. The designs are confined to scrolls and palmettes. In one instance a flying crane is depicted. Later Chinese influence becomes more

and more apparent, and from the eighteenth century onwards designs are outlined in black.

In 737/1336 the last Il-Khaṇid ruler died. The Il-Khanid empire disintegrated and was divided among a number of petty dynasties. Then in the late eighth/fourteenth century a new and ruthless leader emerged in the east: Tīmūr. He sacked and plundered a number of cities in Māzandarān in the north, and some also in Fārs and Kirmān in the south. Nevertheless, he had great respect for beautiful and sacred monuments. He also systematically collected artists in his capital, Samarqand, to beautify it. Tīmūr's work, the patronage of arts, was continued by his sons and successors, who later on moved the capital to Herat. There was then a new renaissance in Persia. Beautiful buildings were erected, painting, calligraphy and bookbinding, and all the other arts, flourished.

In architecture the most outstandings building can be found in Samarqand. The finest among them are the mausoleum-complex of the Shāh-i Zinda. Some of the buildings date from pre-Timurid times. The buildings are richly decorated with faience mosaics and painted tiles. Dense stalactite semidomes hang over the portals. Openwork is frequently apparent [pl. 24(*b*)].

To the Shāh-i Zinda complex is attached Tīmūr's own mausoleum, the Gūr-i Mīr, which was completed in 807/1404. The building is dominated by a huge bulbous dome, covered with enamelled tiles. Walls and portals are similarly decorated [pl. 24(*a*)].

Other religious buildings in Samarqand, Bukhārā, Herat or in Persia proper, are similarly decorated. Of these the *muṣallā* of Gawhar Shād in Herat, the four-*īwān madrasa* in Khargird and the Masjid-i Gawhar Shād in Mashhad should be mentioned. In western Persia the Blue Mosque of Tabrīz deserves special attention. It is one of the very few completely roofed mosques of Persia. Its inner walls were decorated with cobalt-blue faience tiles. The rectangular building was crowned with a central dome surrounded by smaller ones over the sanctuary and the galleries. The mosque was completed in 869/1465.

Islamic architecture in Persia reached its highest quality during the Timurid period, and this was never surpassed in refinement and elegance. The importance of the period for the history of Islamic art, however, is not due to architecture alone. Great progress was made in the art of painting, development of which had already started under the Il-Khanids. Rashīd al-Dīn compiled his universal history, *Jāmi' al-*

*tawārikh*, between 707/1307 and 714/1314. One of the manuscripts, which is divided between Edinburgh University Library and the Royal Asiatic Society, has a number of illustrations. These miniatures clearly reveal the new, Far Eastern elements, which are, however, fully incorporated into the pictures. Landscapes, particularly rocks, trees and clouds, appear in Chinese style [pl. 25(*a*)]. The manuscript was executed in Tabrīz, the home of one of the most important schools of painters during the Il-Khanid and Timurid periods. Copies of the *Kalīla wa-Dimna* are also attributed to Tabrīz.

One of the most famous illuminated manuscripts of Tabrīz is the so-called Demotte *Shāh-nāma* of Firdawsī. The manuscript is dated 730/1330. Far Eastern elements are still evident, but Persian features appear somewhat stronger than in the illustrations of the *Jāmi' al-tawārikh*.

A second school of painting existed in Shīrāz. It was a prosperous city during the Il-Khanid period and was the home of great poets like Sa'dī and Ḥāfiẓ. Four *Shāh-nāma* manuscripts are known to have been illustrated in Shīrāz during the first half of the eighth/fourteenth century [pl. 25(*b*)]; as well as a copy of the *Kalīla wa-Dimna*, dating from 733/1333. The pictures are rather naïvely drawn, in comparison with those of Tabrīz. The backgrounds are painted in red, yellow or blue. Architectural elements are represented by a few small features such as arches. Pictures are small and fully incorporated into the text.

During the Timurid period the centre of painting shifted to Herat, where Shāh-Rukh (807–50/1404–47) became the great patron of artists. Several *Shāh-nāma* and *Kalīla wa-Dimna* manuscripts illustrated in Herat during the middle of the ninth/fifteenth century have survived. The great importance of Herat in painting, however, started under the patronage of 'Alī Shīr Navā'ī, a politician, painter and poet. He patronized Bihzād, the greatest painter in Islamic art.

Bihzād was active from the late ninth/fifteenth century until his death in Tabrīz in *c.* 942/1535–6. He excelled in battle scenes, but was equally outstanding in depicting architectural elements or in the very fine drawing of human figures. Very few signed miniatures are known today. Four of such works illustrate the *Bustān* of Sa'dī. The finest miniatures by Bihzād are, however, in two copies of the *Khamsa* of Niẓāmī in the British Museum. Bihzād had a number of pupils who continued to paint in his style (pl. 26).

In 913/1507 Herat was occupied by the Özbegs and three years later by Shāh Ismā'īl, the founder of the Safavid dynasty. He made Tabrīz his

capital and as a consequence most of the artists, among them Bihzād, followed the new ruler there.

In parallel with book illuminations, bookbinding also reached a very high standard. In Persia, Timurid bookbindings are the finest specimens. Leather was used, the decorations being stamped and incised, and then painted in red, green or blue and gilt. In a number of instances, birds appear against scroll backgrounds.

In calligraphy also great progress was made in Herat. The best calligraphers of the time were working there. The *nasta'liq* script developed in Herat during the Timurid period, as did the *dīwānī* and *dashtī*.

## THE MAMLUK PERIOD OF SYRIA AND EGYPT

During the Mamluk period (648–922/1250–1517), Muslim traditions in arts and architecture continued and flourished without any interruption. The Mongols were halted and defeated by the Mamluks. The Mamluk sultans of Egypt and Syria erected a number of significant buildings. A great number of *madrasas*, mausoleums and mosques were built in Cairo. Most of these have survived up to the present day in more or less satisfactory condition.

Among the religious buildings the mosque and *madrasa* of Sultan Baybars I al-Bunduqdārī, erected between 660/1262 and 668/1269, should be mentioned. Here, unfortunately, only the outer enclosure-walls have survived. The complex of Sultan Qalawun (built in 683/1284–85) comprises a *madrasa*, a mausoleum and a hospital. It is one of the most significant buildings of the Mamluk period, because of its monumental façade with the double windows, the beautiful crenellations and the rich stucco carvings [pl. 27(*a*)]. Inside, the stone and marble coatings and the woodcarvings mark the apex of the Mamluk art.

The mosque of al-Azhar was enlarged and altered a number of times by the addition of the Ṭaybarsiyya *madrasa* in 709–10/1309–10, the Aqbuqāwiyya in 741/1340, and the Jawhariyya *madrasa* in 844/1440.

The mausoleums are mostly domed square buildings with usually a stucco *miḥrāb* and a stucco decorative panel running round the inside of the building. The mausoleum of Aḥmad b. Sulaymān al-Rifā'ī is unique with its glass mosaic decorated *miḥrāb*, dating from 689/1290.

Of secular architecture not much has survived. Some Mamluk

alterations and additions in the citadels of Cairo, Aleppo and in Ḥarrān are still visible. The palace of Dār Bashtāk in Cairo, dating from 742/1341, and a few caravanserais in Egypt and Syria are still standing. In private houses and palaces the *mashrabiyyas* or wooden lattices were generally introduced.

Arabesques played a more important role in Mamluk woodcarvings, of which a great number of *minbars* and *miḥrābs* are preserved in Cairo. The decorations of these are divided into small compartments filled either by arabesques or by geometrical patterns. By the end of the period wood-carving started to decline.

Glass-making reached a high standard during the Mamluk period. A number of mosque-lamps decorated with enamel and gilt are known. The decorations are arranged in horizontal bands containing inscriptions, giving the names and titles of sultans, *amīrs* and high officials for whom the particular object was made. Their heraldic blazons are illustrated in round medallions. Leading glass centres were in Damascus. The making of fine enamel and gilt glass came to an end by the end of the eighth/fourteenth or at the beginning of the ninth/fifteenth century.

In pottery, Mamluk artists followed the examples of the Ayyubid period. The main type of pottery was the lead-glazed *sgraffiato* ware. The glaze is usually transparent brownish-yellow. Large inscriptions appear sometimes on a floral background. Official blazons, so common in Mamluk glass and in metalwork, are also frequently depicted. The production of lustre ware was discontinued in Egypt. Polychrome underglaze-painted wares presenting human and animal figures were still produced.

The production of fine metalwork greatly increased, particularly in three towns: Cairo, Damascus and Aleppo. At that time the inlay technique reached its highest quality. Human figures rarely appear; the main decorative theme is the *naskhī* inscription and heraldic blazons. Some new motives were also apparent, resembling Chinese elements. The best pieces were made under the reign of al-Nāṣir Muḥammad b. Qalawun (693–741/1293–1340), and these were mainly bowls, large basins and candlesticks.

It was about at that time or somewhat later, during the fifteenth and sixteenth Christian centuries, that fine metalwork was produced in Venice in the old Islamic style by craftsmen from Syria and Egypt. Overcrowding, the extensive use of silver and the curious round form of

vessels are the characteristic and distinguishing features of the Venetian metalwork. The majority of them date from the sixteenth century.

One of the greatest achievements of the period was the weaving of geometrical carpets, which seems to have developed during the ninth/fifteenth century, and continued right up to the tenth/sixteenth century. The design, as its name indicates, is confined to geometrical forms: octagons, stars, triangles, etc. The ground colour is red and the decorations are in golden-yellow, blue and in green [pl. 27(*b*)].

## THE OTTOMAN PERIOD

The Ottomans made Bursa their first capital in 727/1326, and the earliest monuments of the period can be found there and at Iznik. Some forty years later the capital was moved to the European territories, to Edirne, the former city of Adrianople, and after the conquest of Constantinople in 857/1453, it became the seat of the new empire.

The earliest Ottoman buildings were modelled on Seljuk architecture, as can clearly be seen in the Ulu Jāmi' of Bursa, erected between 799/1396 and 803/1400. This is a rectangular building divided into twenty equal parts by arcades resting on twelve piers. Each part is roofed by a dome. The ground-plan of the Eski Jāmi' of Edirne (807–17/1404–14), or that of the Zinjirli Kuyu Jāmi' of Istanbul (end of the ninth/fifteenth century) follow the same principle.

These mosques are not characteristic of the period. Ottoman mosques, as a principle, are square buildings, covered by a large central dome. To this main part a number of smaller parts can then be added which are then roofed by smaller domes or semi-domes. Minarets played an important part. These are slender, tall, round or polygonal towers with a balcony on the upper part for the muezzin.

*Medreses* largely follow the traditional Anatolian types, the cells of students and lecture rooms being connected by an arcade and surrounding the rectangular courtyard. *Türbes* or mausoleums are square or polygonal and are covered by the traditional conical or pyramidal roof.

The inner decoration of religious buildings deserves special attention. Large surfaces were covered by painted faience tiles or faience mosaics, which were mainly produced at Iznik. The earliest known faience *miḥrāb* of the period is in the Green Mosque of Bursa (824/1421), which

was signed by a Tabrīzī artist. The building itself is the work of a Turkish architect.

The finest Ottoman religious buildings were erected by Sinān Pasha, one of the greatest Turkish architects (896–997/1490–1588). Some three hundred and fifty buildings are attributed to him, of which the Süleymāniye mosque in Istanbul (965/1557), and the Selīmiye Jāmi' of Edirne (977–83/1569–75) [pl. 28(*b*)] are the best known. The mosque of Sultan Aḥmed, or Blue Mosque (so called because of its inner tile decoration), is the last among the great Ottoman mosques (1018–26/1609–17).

In secular architecture the Ottoman caravanserais, which differed somewhat from previous Seljuk models, should be mentioned. Arranged around a central rectangular courtyard the buildings were provided with two floors, the ground floor providing accommodation for shops, workshops and stables, and the upper one rooms for travellers merchants and craftsmen.

*Ḥammāms* or baths followed the traditional line. These were covered by a number of small domes. Great numbers of Ottoman *ḥammāms* are preserved in Anatolia and in other parts of the former Ottoman empire.

Covered bazaars roughly followed the ground-plan and arrangement of the caravanserais but without the central courtyard. Public fountains were decorated with richly carved stones of Iznik faience tiles. Among the palaces the Topḳapı̄ Sarayı̄ complex in Istanbul should be mentioned. Later palaces, like the Dolmabaghche, Beylerbeyi and many others, were erected in European styles. From the eighteenth century onwards, Turkish architecture, both religious and secular, follows the contemporary European styles, such as baroque and rococo.

In pottery a distinct type was discovered during an excavation some forty years ago by the late Friedrich Sarre at Miletus. Thus the name 'Miletus ware' was wrongly given to them. They are of red clay and are painted on a ground white slip under a clear glaze in blue, green and black. The decorations are presented in a naturalistic style. Rosettes, scrolls, flowers or birds appear on the small bowls, which are the commonest type of this 'Miletus ware'. Excavations by Professor Oktay Aslanapa at Iznik have established that the 'Miletus ware' was produced at Iznik and can be dated to the eighth/fourteenth and ninth/fifteenth centuries.

Later Iznik pottery can be divided into three main groups. The first

period, which was previously called the 'Abraham of Kütahya' group, is generally considered to date from 896/1490 to 932/1525. The body in all three groups is white and soft. During the first period vessels like large dishes, mosque-lamps, jars, ewers, and standing-bowls, were painted in cobalt-blue on a white ground. The designation of 'Abraham of Kütahya' derives from a signed piece.

The decorations of the second period specimens were painted, in addition to cobalt-blue, in turquoise-green and sometimes also in purple. They date from 932/1525 until about 963/1555. An outstanding example of this period, a mosque-lamp, which was made for the Dome of the Rock in Jerusalem in 956/1549, is in the British Museum.

In the third period (*c.* 964–1113/1555–1700) a lively red is added to the colour scheme. Wall-tiles belonging to this group are preserved in a number of mosques in Istanbul and in the Selīmiye Jāmi' of Edirne. Carnations, tulips, and roses appear in dishes, and jars. Ships, human and animal figures, and birds are also depicted [pl. 29(*a*)].

After the decline of pottery-making in Iznik, a new pottery centre emerged at Kütahya, producing vessels mainly for the Armenian communities of Anatolia. Kütahya wares are of white earthenware and decorations are painted in yellow, blue, grey and green on a white ground under a clear glaze. Many signed and dated pieces are known from the eighteenth and nineteenth centuries.

Another pottery centre of less importance was at Chanakkale on the Dardanelles. Porcelain was also manufactured in Turkey, but the cheap imported mass-produced European porcelain seems to have put an end to these experiments.

Great progress was made in calligraphy and miniature painting under the Ottomans. There was a school of calligraphists and painters in the palace of Istanbul under the patronage of the sultans. Among them Sultan Meḥmed the Conqueror had the greatest name for supporting the arts. He invited Italian painters to Istanbul and sent Turkish artists to study in Italy. Naqqāsh Sinān Bey also studied in Italy and on his return to Turkey painted, among many other things, the portrait of Sultan Meḥmed.

Turkish calligraphists and illuminators developed a new style and their great achievement and merit was in the fact that they recorded the important historical events of their time. Matraqji, the celebrated geographer and historian, for example narrated the Persian campaign of Sultan Süleymān the Magnificent. 'Oṣmān, in his *Hüner-nāme* (dated

957–68/1550–60), recorded the history of the Ottoman sultans in two volumes. In the accounts of the Szigetvár campaign written by Ferīdūn Pasha in 976/1568, events of the campaign and Sultan Süleymān's death are described, and are illustrated by a number of miniatures.

There are about 10,000 or even more illuminated Turkish manuscripts in the Topḳapī Sarayī Müzesi in Istanbul, recording historical events and topography of cities or depicting the portraits of sultans and high officials. Other manuscripts, quite contrary to Islamic tradition, depict scenes from the Prophet Muḥammad's life and of the greatest events of Islamic history.

One of the last great Ottoman painters was Levnī, who lived in the eighteenth century. His greatest work represents the festivities organized for the wedding of Sultan Aḥmed II's daughter. Levnī was already working under the strong influence of European painting, which eventually completely destroyed the real character of Ottoman painting.

Apart from painting it was in the field of textiles and carpets that great progress was made under the Ottomans. The Turks, who had already excelled in carpet making for many centuries, developed many new types during that period. One of the earliest types was the so-called 'animal carpet', which can be dated to the eighth/fourteenth and ninth/fifteenth centuries. The so-called 'Holbein rugs' with arabesque patterns in the field and Kufic characters on the border, are known from Dutch and Italian paintings of the sixteenth and seventeenth centuries.

Several types were produced and developed in Ushak. Among them the medallion and star Ushak and the so-called 'Transylvanian carpets' should be mentioned. Prayer rugs representing *miḥrāb* niches are known to have been made in Ghiordes, Kula, Ladik, Bergama and at Mujur. Rugs made in the Caucasus have distinct geometrical designs. Persian influence on them is apparent. They mostly date from the nineteenth century.

Brocades, velvets and embroideries were made in Bursa, in the neighbourhood of Edirne, and at a number of places along the Aegean coast. On brocades and velvets some Italian influence can be observed. Embroideries are very colourful, sometimes so fine that they give the impression of painting [pl. 29(*b*)]. These are embroidered on linen or silk. They are reversible, and generally represent beautiful flowers and cypress-trees. They mostly date from the eighteenth and nineteenth centuries.

## THE SAFAVID PERIOD IN PERSIA

Shāh Ismā'īl (907–30/1502–24), the founder of the Safavid dynasty, occupied Herat in 913/1507, and took a great number of artists with him to his capital in Tabrīz. No monuments survive of his or his immediate successors' time. His palace at Kwuy, north-west of Tabrīz, is known only from the description of European travellers. Later on the capital was moved to Qazvīn, where Shāh Ṭahmāsp (930–84/1524–76) erected the royal mosque and his palace, parts of which can still be seen today.

Great building activity did not really start until the accession to the throne of Shāh 'Abbās I (985–1038/1587–1629). He once again moved the capital to Iṣfahān, and was responsible for the planning and erection of the royal square, the Maydān-i Shāh. The Maydān-i Shāh is surrounded by the royal mosque, the Masjid-i Shāh on the south, the Masjid-i Shaykh Luṭf Allāh on the east, the Qayṣariyya Bazaar on the north and the 'Alī Qapu palace on the west.

The Masjid-i Shāh, one of the greatest achievements of Safavid architecture, is a large four-*īwān* mosque, the walls of which are covered by faience tiles and mosaics. The monumental portal is flanked by two slender minarets with balconies on their top (pl. 30), then the axis of the whole mosque is turned around the entrance hall for the correction of the *qibla* towards the south-west. There is a large dome over the *qibla īwān*, decorated inside and outside with faience mosaics, recalling the ornaments of carpets. The building, which was erected between 999/1590 and 1025/1616, bears the signature of the architect, Ustād Abu'l-Qāsim and a number of calligraphers.

The Masjid-i Shaykh Luṭf Allāh is a small covered mosque, again turned behind the entrance hall in order to correct the orientation of the *qibla*. It has a huge dome similarly decorated to that of the Masjid-i Shāh. The building was completed in 1028/1618.

The 'Alī Qapu palace was the seat of Shāh 'Abbās's government, and his official residence. The ground floor provided rooms for offices and for the guards, while on the first floor was a large audience hall and a gallery, a *tālār*, opening into the royal square [pl. 28(*a*)]. There are two more floors, the rooms of which were decorated with mural paintings, openwork and niches for glass and pottery.

The shah's private residence was in the Chihil Sutūn or 'Palace of the forty columns'. There is a large pool in front of the building in

which the columns of the gallery, the *tālār*, are reflected. From there opens the audience hall, the walls of which were originally decorated with mural paintings representing hunting scenes and landscapes. The palace originally had a number of lacquer painted doors, which are now scattered in a number of European and American museums. The building was partially destroyed by fire in the eighteenth century.

The Safavids contributed a great deal to the decoration and enlargement of the complex of the *Imām* Riżā's shrine in Mashhad. Work began there under Shāh 'Abbās I in 1010/1601. Oratories, *madrasas*, and libraries were added and richly decorated in faience mosaic and glass.

The last great contribution to Persian architecture was the erection of the Madrasa Mādar-i Shāh in Iṣfahān, at the beginning of the eighteenth century. It is built in the traditional style, having four *īwāns* opening on to a central courtyard. The *qibla īwān* has a dome and a minaret. Walls are covered all over with painted faience tiles. Decorations of later buildings, such as the Vakīl Madrasa in Shīrāz (twelfth/eighteenth century), or the shrines at Karbalā' and Sāmarrā, and the Sipahsālār Mosque in Tehran (nineteenth century), never reach the heights of previous architecture.

In miniature painting, Herat remained the centre only for a few years after Shāh Ismā'īl's occupation of the city. Artists, like Bihzād and many of his pupils, moved to the new capital, Tabrīz. Thus Tabrīz became once more a centre of Persian painting. Another new centre emerged in Bukhārā, which was very active during the tenth/sixteenth and early eleventh/seventeenth centuries. Illumination of manuscripts of the *Shāh-nāma* and *Khamsa* of Niẓāmī continued. Bihzād's style was followed for quite a long time. Upon the moving of the capital to Iṣfahān under Shāh 'Abbās I, a new school of painters was founded there which excelled not only in miniature painting, but also in the production of bookbindings and in lacquer-works as well.

Carpets of the Safavid period were greatly influenced by contemporary miniature-painting and bookbinding. Under Shāh Ismā'īl and Shāh Ṭahmāsp, Tabrīz became an important centre of carpet-weaving, but places like Kāshān, Iṣfahān, Yazd and Kirmān also produced a number of types. Animal and hunting carpets are known from the tenth/sixteenth and eleventh/seventeenth centuries. Large medallion carpets

were made in the tenth/sixteenth century. The finest example of that type is the Ardabīl carpet in the Victoria and Albert Museum. It dates from 946/1539. The vase rugs, it seems, were made in north-western Persia in the tenth/sixteenth and eleventh/seventeenth centuries, while the 'garden carpets' may have been the products of south and south-eastern Persia, possibly of the Kirmān region.

Rugs with Chinese cloud-patterns and extensive floral designs came from Khurāsān and Herat, and may date from the tenth/sixteenth and eleventh/seventeenth centuries. Some floral and animal rugs were made in silk in the tenth/sixteenth century. The so-called 'Polish rugs', the name derived from the eagle on them, believed for a long time to be the Polish eagle, were actually made in Persia and sent out as gifts by Shāh 'Abbās I. They were probably manufactured in Kāshān and Iṣfahān [pl. 31(*a*)]. Tapestry-woven silk rugs, *kilims*, of the same period were made in medallion, floral, vase and in animal designs. Carpet-making still flourishes in Persia in the Tabrīz, Hamadān, Kāshān, Iṣfahān and Kirmān regions.

Safavid brocades, velvets and embroideries were influenced by miniature painting just as carpets were. Designs frequehtly depicted scenes from the *Shāh-nāma* and the *Khamsa* of Niẓāmī. These brocades and velvets were exported to Europe, and a number were presented by Shāh 'Abbās I to European rulers. He supported the weaving-centres, which apparently were located in Kāshān and Iṣfahān.

Metalwork in the Safavid period was still flourishing, and a number of dated and signed pieces are preserved in museums and private collections. Inlaying was not so much favoured, and was used on copper or brasswork. It more often appears on iron and steel vessels, or zoomorphic figures are weapons. These were inlaid in gold and silver, but gold inlay is more characteristic of the period. Brass vessels are engraved or in relief decoration; backgrounds are frequently filled with niello [pl. 31(*b*)]. Metalwork centres were in Tabrīz, Iṣfahān and in Kirmān. Tabrīz was and still is famous for its fine silverware, decorated with minutely drawn engraved designs.

Several new types of pottery appeared during the Safavid period. Among them the earliest and probably the finest was the so-called 'Kubachi ware'. These were most likely made in north-western Persia in the Tabrīz region. Decorations, which often present human figures, animals and birds, are painted in blue, yellow, green and dull brownish-red under a clear glaze on a white ground [pl. 32(*a*)]. There seems to be a

connection with or influence by Iznik pottery. The finest specimens date from the tenth/sixteenth century.

During the eleventh/seventeenth century, lustre painting was re-introduced, using brownish or ruby lustre on a very hard, white earthenware. The place of production is not yet known. Fine white wares, similar to those of the Seljuk period, decorated with incised lines, in openwork, or painted in black and blue, appeared again in the eleventh/seventeenth century [pl. 32(*b*)]. These wares are known as 'Gombroon wares', after the harbour (modern Bandar 'Abbās) in the Persian Gulf, whence they were shipped and exported to Europe.

Kirmān seemed to have been responsible for the production of a number of monochrome-glazed wares, mainly of celadon, brown or blue colours. Sometimes these were painted in white, or the design was incised right down to the white body. Underglaze-painted polychrome wares were also made in Kirmān during the eleventh/seventeenth and twelfth/eighteenth century.

In later times, Iṣfahān and Tehran produced underglaze-painted vessels and tiles. Decorations often appeared in relief. Figures were naïvely drawn, and the quality was far inferior to those of the earlier types. Import of mass-produced European and Far Eastern porcelain caused the final decline of the industry in Persia.

# CHAPTER I.

## INTRODUCTORY.

Mesopotamia and Persia, their provinces under the Abbasid Caliphs. The outlying provinces to the north-west and the north-east. The high roads from Baghdâd to the Moslem frontier. The Moslem geographers, and their works. Other authorities. Place-names in the Arabic, Turkish, and Persian provinces.

Mesopotamia and Persia had formed the kingdom of the Sassanian Chosroes, which the Arabs utterly overthrew when, after the death of Muḥammad, they set forth to convert the world to Islam. Against the Byzantines, the other great power which the Moslems attacked, they achieved only a partial victory, taking possession, here and there, of rich provinces, notably of the coast lands to the south and east of the Mediterranean; but elsewhere the Emperors successfully withstood the Caliphs, and for many centuries continued to do so, the Roman empire in the end surviving the Caliphate by over two hundred years.

The kingdom of the Sassanians, on the other hand, the Arabs completely overran and conquered; Yazdajird, the last of the Chosroes, was hunted down and slain, and the whole land of Îrân passed under the rule of Islam. Then further, and to no inconsiderable extent, the empire of the Caliphs, which had taken over bodily the administration of the older Persian kingdom, came itself to be modelled on the pattern in government which the Chosroes had established; this more especially under the Abbasids, who, rather more than a century after the death of the Prophet, overthrew their rivals the Omayyads, and changing the seat of the Caliphate from Syria to Mesopotamia, founded Baghdâd on the Tigris, a few miles above Ctesiphon, the older winter capital of the Sassanians.

Baghdâd forthwith became, for the East, the centre of the Moslem empire, but from the time of the first Abbasid Caliph this empire no longer remained, even nominally, undivided. Spain fell off, and before long an Omayyad Caliph at Cordova was the rival of the Abbasid Caliph at Baghdâd. In rather more than a century after their establishment in power, the Abbasids also lost Egypt, which, at about the date when the Omayyad prince at Cordova had recently proclaimed himself Commander of the Faithful, passed into the power of the Fatimids, who likewise took the style of Caliph, and renounced allegiance to Baghdâd. Syria had for the most part followed the fortunes of Egypt; Arabia was the debateable land between the two; in the Further East many provinces became independent of the Abbasid Caliph, but there no permanent rival Caliphate was established; so that in general terms all those broad provinces, which had formed the Sassanian kingdom before the days of Islam, remained to the last nominally, if not really, subject to the Abbasids. This vast stretch of country, bounded to the eastward by the deserts of Central Asia, with the mountains of Afghanistân, and westward by the Byzantine empire, was divided among the many provinces which will be described in detail in the succeeding chapters of the present work. The names of the provinces, and their boundaries, for the most part (and as far as is known), were under the Arabs identical with those that had existed under the Chosroes; indeed the East alters so little that in the majority of cases both names and boundaries have remained almost unchanged to the present day, though, as was to be foreseen, the political state, and especially the economical or material conditions of the country, have varied considerably during the last thirteen hundred years.

It will be convenient, before proceeding further, to give a brief summary of these various provinces, taking them in the order in which they are described in the succeeding chapters.

The great lowland province, which the Greeks called Mesopotamia, is the gift of its two rivers the Euphrates and the Tigris; and the latter in its lower course (as will be more fully explained in Chapter II) did not, in Abbasid times, run in the channel which its waters follow at the present day. A glance at the map shows that the sterile Arabian desert comes close up to the

western border of the Euphrates, and this river, therefore, has no right bank affluents. With the Tigris, on the other hand, it is different; the highlands of Persia follow a line standing back at a considerable distance from the eastern side of this river, and many streams flow down from the Persian mountains, these forming numerous left bank affluents of the Tigris. The Moslems inherited from the Sassanians a system of irrigation for Mesopotamia which made this province one of the richest in the known world. The system will be more fully explained later; but briefly it may be said that the Arabs effectually watered the country lying between the two rivers by draining the surplus of the Euphrates through a number of transverse canals flowing to the Tigris; while the districts to the eastward of the Tigris, extending up to the foot-hills of the Persian highlands, were watered in part by the streams which flowed down from these mountains, in part by a series of loop canals, taken from the left bank of the Tigris, and returning to it again, which in turn absorbed the flood-waters of the many small rivers rising in the eastern hills.

The Arabs divided Mesopotamia into two provinces, Lower and Upper, of which the Lower comprised the rich alluvial lands known anciently as Babylonia. Lower Mesopotamia was called Al-'Irâḳ, and its northern limit (which, however, varied at different times) was a line going east and west, from points on the Euphrates and Tigris, respectively, where these two rivers first began to flow near each other through the Mesopotamian plain. The largest city of 'Irâḳ, under the Abbasids, was of course Baghdâd; but already a century before that dynasty had come to power, the first Moslems, on conquering this part of Mesopotamia, had founded three great towns, Wâsiṭ, Kûfah, and Baṣrah, which continued to flourish for many centuries; and these, with Anbâr (already a city in Sassanian days) lying on the Euphrates in the latitude of Baghdâd, were the great centres of population in the 'Irâḳ province under the Abbasid Caliphs.

North of the limit of the alluvial lands stretched the hard and somewhat stony plains of Upper Mesopotamia, where had been the kingdom of Nineveh in ancient times. Upper Mesopotamia the Arabs called Al-Jazîrah, 'the island,' or rather 'the peninsula,'

or partial island, for these great plains were almost enclosed by a ring of waters, formed by the upper courses of the Euphrates and Tigris, and by streams or canals joining the two to the southward of the stony plains. The province of Jazîrah extended north to the mountains in which the two great rivers had their sources; it was divided into three districts, named after the Arab tribes which had settled here in the times of the Chosroes, and its chief towns were Mosul near the ruins of Nineveh, Âmid on the Upper Tigris, and Raḳḳah at the great bend of the Euphrates, near the desert border on the further side of which is Damascus.

The chapter following deals with the mountainous countries in which the twin rivers, which are the head streams of the Euphrates, take their rise. This country formed the debateable land between the Caliphate and the empire. Time and again its towns and fortresses were taken and retaken, by Moslems and Christians, as the tide of war ebbed and flowed. The country was never permanently settled by the Arabs, and detailed description of it is for the most part lacking in our earlier authorities. The same remark, and in a higher degree, applies to the province called Rûm (the Roman Territory) which, till the latter part of the 5th (11th) century, remained an integral part of the Byzantine empire; for between this province and the Caliphate the great rampart of the Taurus chain formed the line of demarcation. Almost yearly the Moslems made incursions through the Taurus passes into Anatolia; more than once they laid ineffectual siege to Constantinople; and at times they garrisoned and occupied divers fortress towns up on the great plateau of Asia Minor. But beyond such temporary occupation the Abbasid Caliphs did not succeed in conquering the upland country; they made many raids through Asia Minor, but they held no land, and Moslem rule was not established there, until in the decline of the Caliphate, the Saljûḳ Turks settled in these highlands which they wrested from the Byzantines, and then finally Asia Minor, or Rûm, came to be counted as Moslem land, in which condition it still remains.

To the east of Jazîrah, or Upper Mesopotamia, came the province of Adharbâyjân, the ancient Atropatene, bounded above and below, respectively, by the Araxes and the White River, the Safîd-

Rûd, both of which streams flowed into the Caspian. The most notable natural feature of this province was the great salt lake, now known as the lake of Urmîyah, near which stood Tabrîz and Marâghah, the provincial capitals, while Ardabîl, another great town, lay to the eastward nearer the shore of the Caspian. The chapter following describes a number of smaller provinces of the north-western border. First Gîlân, or Jîlân, on the Caspian, where the Safîd-Rûd, breaking through the Alburz range, the mountain barrier of the Persian highlands, flows through an alluvial plain of its own making, pushing out a small delta into the Caspian. Next, the province of Mûghân at the mouth of the combined Araxes and Cyrus rivers; then Arrân lying to the westward between the courses of these two rivers; with Shirvân to the north of the Cyrus, and Gurjistân (Georgia) at its head waters. Lastly we have Moslem Armenia lying at the head waters of the Araxes, which is the mountainous province surrounding the lake of Vân.

South-east of Adharbâyjân spreads the rich province of Media, which the Arabs very appropriately called Al-Jibâl, 'the mountains,' for its mountains overhang the lowlands of Lower Mesopotamia, and, range behind range, stretch across eastward to the border of the Great Desert of Central Persia. The western part of the Jibâl province, in later times, when the Kurds attained fame and power, came to be known as Kurdistân; and in the later middle-ages, but by a misnomer, as will be explained in due course, the province of Al-Jibâl was often called 'Irâḳ 'Ajamî, or *Persian* 'Irâḳ, in contrast to *Arabian* 'Irâḳ, which was Lower Mesopotamia. The Jibâl province included many great cities; in the west Kirmânshâh and Hamadân (the latter the ancient Ecbatana); in the north-east Ray (Rhages), and to the south-east Ispahân. At a later period the Mongols of Persia founded Sulṭânîyah in its northern plains, which for a time taking the place of Baghdâd, became the capital of this portion of their empire, which included both Mesopotamia and Persia under the rule of the Îl-Khân. In the mountains of the Jibâl province many rivers take their rise, among the rest the Kârûn, which the Arabs called Dujayl or Little Tigris, and which after a long and tortuous course flows out at the head of the Persian Gulf, a little

to the east of the combined mouth of the Euphrates and Tigris.

The province of Khûzistân, lying south of Media and east of Lower Mesopotamia, occupies the lower course of the Kârûn river, or Dujayl, with its numerous affluents. This country was extremely rich; Tustar and Ahwâz were its chief towns; and its lands being plentifully irrigated were most productive. East of Khûzistân, and bordering the Gulf, lay the great province of Fârs, the ancient Persis and the cradle of the Persian monarchy. Under the Abbasids it still kept the division into the five Kûrahs, or districts, which had been organized under the Sassanians, and Fârs was closely studded with towns, great and small, the most important of which were Shîrâz the capital, Iṣṭakhr (Persepolis), Yazd, Arrajân, and Dârâbjird. The islands of the Gulf were counted as of Fârs, and Ḳays island was an important commercial centre before the rise of Hurmuz. The chief physical feature of Fârs was the great salt lake of Bakhtigân, which with other smaller sheets of water stood in the broad highland valleys, whose mountains were offsets of the ranges in the Jibâl province, already referred to. In Fârs, the Dârâbjird district under the Mongols came to be counted as a separate province, and was in the 7th (13th) century called Shabânkârah; the Yazd district also, in the later middle-ages, was given to the Jibâl province.

To the east of Fârs lay the province of Kirmân, far less fertile, almost lacking in rivers, and bordering on the Great Desert. Of this province there were two capitals in Abbasid times, Sîrjân and Kirmân city; and the two other most important towns of the province were Hurmuz, on the coast; and Jîruft, inland, a centre of much commerce. The Great Desert of Central Persia is the most remarkable physical feature of the high tableland of Îrân. This immense salt waste stretches south-east diagonally across Persia, from Ray, at the base of the mountains which on their northern side overlook the Caspian, spreading in a broad band —or rather, in a dumb-bell-shaped depression—the lower end of which merges into the hills of Makrân, the province bordering on the Indian Ocean. In the Great Desert there are few oases; a salt efflorescence covers much of the barren levels, but the desert in winter time is not difficult to pass, and many well

marked tracks connect the towns on either side. But on the other hand the Great Desert is a real barrier to any continuous intercourse between the provinces of Fârs and Kirmân, which lie on its south-western side, and the eastern provinces which are beyond its other limit, namely Khurâsân with Sîstân to the south-east, and this desert barrier has played an important part all through the history of Persia. After describing what the Moslem geographers have to say of the Great Desert, the same chapter deals with the Makrân province, which on the east touched India, running up to the highlands overlooking the Indus valley, part of which is now known as Balûchistân. On these regions, however, our authorities are not very fully informed.

North of Makrân, and across the narrow part of the desert opposite Kirmân, lay the province of Sijistân or Sîstân, to the east of the extensive, but very shallow lake of Zarah. Into this lake drained the waters of the Helmund, and numerous other rivers flowing south-west from the high mountains of Afghanistân lying above Kâbul and Ghaznah. Here Ḳandahâr stood in a plain between two of the affluents of the Helmund, and where this great river flowed into the Zarah lake lay Zaranj, the capital of Sijistân. North-west of the Zarah lake, and on the border of the Great Desert, was the very hilly province aptly called Ḳûhistân (Land of Mountains), the chief towns of which were Tûn and Ḳâyin, well known as the Tunocain of Marco Polo; Sijistân and Ḳûhistân thus forming the southern border of Khurâsân, the great eastern province of Persia.

Before describing this last, however, the three small provinces of Ḳûmis, Ṭabaristân and Jurjân, which form the subject of the succeeding chapter, require notice. Ḳûmis, of which the capital was Dâmghân, lay in length along the north border of the Great Desert eastward of Ray, comprising the southern foot-hills of the mountain chain of Alburz which shuts off the high plateau of Persia from the Caspian Sea. These mountains, and more particularly their northern flank descending to the Caspian, formed the province of Ṭabaristân, otherwise called Mâzandarân, which extended from Gîlân and the delta of the White River (Safîd-Rûd), on the west, to the south-eastern corner of the Caspian. Here Ṭabaristân joined Jurjân, or Gurgân, the ancient

Hircania, which included the valleys watered by the rivers Atrak and Jurjân, on which last stood Jurjân city. The Jurjân province extended eastward from the Caspian Sea to the desert which separated Khurâsân from the cultivated lands of the Oxus delta, namely the province of Khwârizm.

The modern province of Khurâsân is but a moiety of the great tract of country which, from Abbasid times down to the later middle-ages, was known under this name; for Khurâsân of those days included what is now become the north-western part of Afghanistân. On the east, medieval Khurâsân bordered on Badakhshân, its northern frontier was the Oxus and the desert of Khwârizm. The Moslem geographers divided Khurâsân into four quarters, named after its four capital cities; *viz.* Nîshâpûr, Marv, Herat, and Balkh. From a physical point of view the remarkable feature of Khurâsân consisted in the two great rivers of Herat and of Marv, which rising in the mountains of what is now Afghanistân, turned north and flowed out to waste in the sands of the desert towards Khwârizm, reaching no sea or lake.

The chapter following deals with the upper waters of the Oxus, and a number of small provinces, stretching from Badakhshân westwards, which lie to the north, on the right bank affluents of the great river. Its delta, forming the province of Khwârizm to the south of the Aral Sea, is next described, of which Urganj was the older capital, and in this chapter some pages are devoted to clearing up the much debated subject of the older course of the Oxus to the Caspian. Beyond the great river, and between the Oxus and the Jaxartes, lay the province of Sughd, the ancient Sogdiana, with its two noble cities, Samarḳand and Bukhârâ, both on the Sughd river. This is the penultimate chapter of the present work; and the last chapter deals with the provinces along the Jaxartes, from Farghânah near the borders of the Chinese deserts, of which the capital was Akhsîkath, to Shâsh, modern Tâshkand, with the Isbîjâb province to the north-west, beyond which the Jaxartes flowed out, through the bleak wilderness, into the upper part of the Aral Sea. Of these northern countries of the Further East, however, lying beyond Central Asia, the earlier Arab geographers give but a succinct account. They were the Turk lands, and it was only after the Mongol invasion that they

rose to importance; of this period unfortunately there is a lack of precise information, the Arab geographers failing us for the most part, and their place being but ill-supplied by the later Persian and Turkish authorities.

The Moslems, by the injunction of their Prophet, were bound each, once in a lifetime, to make the pilgrimage to Mecca. Under the Abbasids, when the Moslem empire reached its fullest extent, the pilgrimage was facilitated by the elaborate system of high roads, all made to radiate from Baghdâd, where the Tigris was crossed by those coming from the further east and bound for the Hijâz. Of this road system (which the Arabs had inherited from the earlier Persian kingdom) we possess detailed contemporary descriptions; and the chief lines, running through the provinces named in the foregoing paragraphs, may here be summarily described.

The most famous of the trunk roads was the great Khurâsân road, which, going east, united the capital with the frontier towns of the Jaxartes on the borders of China. This, too, is perhaps that which of all the roads is best described. Leaving East Baghdâd by the Khurâsân gate, it went across the plain, passing over numerous streams by well-built bridges, to Ḥulwân at the foot of the pass leading up to the highlands of Persia. Here it entered the Jibâl province and after a steep ascent reached Kirmânshâh, the capital of Kurdistân. Crossing the Jibâl province diagonally, north-east, the road passed through Hamadân to Ray. From Ray onwards it went almost due east through Ḳûmis, having the Ṭabaristân mountains on the left, and the Great Desert on the south, till it entered the province of Khurâsân near the town of Bisṭâm. Continuing onwards it came to Nîshâpûr, then to Ṭûs, and on to Marv, beyond which it crossed the desert to the Oxus bank at Âmul, thence reaching successively Bukhârâ and Samarḳand in the province of Sughd. At Zâmîn a short distance east of Samarḳand, the road bifurcated: on the left hand one road proceeded to Shâsh (Tâshkand) and ultimately to the ford at Utrâr on the lower course of the Jaxartes; the other road, leaving Zâmîn, turned off to the right, towards Farghânah and the Upper Jaxartes, coming to Akhsîkath the capital, and finally to Ûzkand on the borders of the Chinese desert.

This in its full extent was the great Khurâsân road; and to the present day the post-roads crossing Persia, but centring in Ṭihrân, near the older Ray, follow the same long track which the earlier Arab geographers have described. After the fall of the Abbasid Caliphate, the road system was in part altered by the building of Sulṭânîyah, which became the capital of the Mongols. But all that this entailed was a branch road north from Hamadân direct to Sulṭânîyah, which, for a time, took the place of Ray as the centre point of the roads in this quarter.

In earlier days, under the Abbasids, cross-roads had branched off, right and left, to various parts of Persia from the chief towns along the Khurâsân high road. Thus from near Kirmânshâh a road went north to Tabrîz and other towns on the Urmîyah lake, with prolongations to Ardabîl and to places on the Araxes. From Hamadân, going south-east, there was a high road to Isfahân; and from Ray, going north-west, the distances to Zanjân are given, whence a highway led up to Aṛdabîl. Nîshâpûr in Khurâsân was a centre for many branch roads; southwards one went to Ṭabas on the borders of the Great Desert in Ḳûhistân; another road went to Ḳâyin; while south-east was the highway to Herat, whence Zaranj in Sijistân was reached. From Marv a high road followed up the Marv river to Lesser Marv (Marv-ar-Rûd), where, joining a road coming from Herat, it went on to Balkh and the eastern frontier lands beyond the Oxus. Finally from Bukhârâ there was direct communication, north-west, with Urganj in Khwârizm; and, south-west, with Tirmid on the Oxus opposite Balkh.

This completes the system of the Khurâsân road; and now returning to Baghdâd, the central point, the highways going in other directions must be sketched. Down the Tigris, the distances and stations being given both by land and by water, was the highway through Wâsiṭ to Baṣrah, the great port for the trade of the Persian Gulf. From both Wâsiṭ and Baṣrah, Ahwâz in Khûzistân was reached, and thence the high road went due east to Shîrâz in Fârs. This was a centre of many roads. North was the road to Isfahân and on to Ray; north-east, through Yazd and across the Great Desert Ṭabas was reached, which communicated with Nîshâpûr; eastward by more than one route Sîrjân and

Kirmân were in communication, and thence eastward across the Great Desert was the way to Zaranj in Sijistân; while south-east and south from Shîrâz two roads branched towards the Persian Gulf ports, one passing through Dârâbjird to Sûrû near Hurmuz, the other to Sîrâf, at one time the chief harbour of Fârs.

Returning once again to Baghdâd, the central point, we find that the great Pilgrim road to Mecca and Medina left West Baghdâd, going south to Kûfah on the border of the Arabian desert, which it crossed almost in a direct line to the Ḥijâz. A second Pilgrim road started from Baṣrah, running at first nearly parallel with the other, which it finally joined two stages north of Mecca. Then from Baghdâd, north-west, a road went to the Euphrates at Anbâr, and thence up that river to Raḳḳah, a centre point for roads across the Syrian desert to Damascus, and for many other highways going north to the Greek frontier towns. Finally from Baghdâd, north, there were high roads up both banks of the Tigris to Mosul, whence Âmid was reached on the one hand, and Ḳirḳîsiyâ on the Euphrates to the south-west. From Âmid there were roads communicating with most of the frontier fortresses towards the Greek country.

This in brief was the road system under the Abbasids, which, centring in Baghdâd, connected the capital by a system of post-stages with the outlying provinces of the empire. The system is very carefully described by the Arab geographers, and for purposes of reference it may be well now to give in chronological order a short account of our contemporary authorities, on whose works we rely for the facts set down in the following chapters[1].

The earlier of our authorities date from the middle of the 3rd (9th) century, and the first geographical treatises of the Arabs take the form of Road Books. These set forth in detail the various itineraries, are interspersed with short accounts of the towns passed through, and give the revenues and products, in turn, of each province. Of these Road Books we possess four, in particular, which are of primary importance, and they complement

[1] For further particulars of the Arab geographers see *Palestine under the Moslems* (London, 1890), the Introductory chapter; also for more detail, the Introduction to the French translation of Abu-l-Fidâ, by M. Reinaud (Paris, 1848).

each other, for their texts have in many passages come down to us in a mutilated condition. The authors of these Road Books of the 3rd (9th) century are Ibn Khurdâdbih, Ḳudâmah, Ya'ḳûbî and Ibn Rustah.

The first two are almost identical in substance. Ibn Khurdâdbih was post-master of the Jibâl province, Kuḍâmah was a revenue accountant; their itineraries give stage by stage the distances along the great Khurâsân road and the other trunk roads, as sketched in the preceding paragraphs, which radiated from Baghdâd. The work of Ya'ḳûbî has unfortunately not reached us in its entirety; to it we owe the account of Baghdâd which, with the description written by Ibn Serapion, has made it possible to work out in detail the topography of the Abbasid capital. Ya'ḳûbî gives further a number of valuable notes on many other cities, and the details of the high roads traversing the 'Irâḳ province are found fully set forth only in his work. Of Ibn Serapion, his contemporary, only a fragment has reached us; but this, in addition to the account given of Baghdâd, is of capital importance for the river and canal system of Mesopotamia; he gives also shorter descriptions of the rivers in other provinces. Ibn Rustah has written a similar work to Ya'ḳûbî, adding many notices of towns; but above all he has given us a most minute account of the great Khurâsân road as far as Ṭûs, near Mashhad, with some of its branch roads, notably those going to Isfahân, and to Herat; also the road from Baghdâd south to Kûfah, and to Baṣrah, with the continuation eastward to Shîrâz. On all these trunk lines, not only are the distances and stages given, but an exact description is added of the nature of the country passed through; whether the way be hilly, ascending or descending, or whether the road lies in the plain; and this description of Ibn Rustah is naturally of first-rate importance for the exact identification of the line traversed, and for fixing the position of many lost sites. Another authority is Ibn-al-Faḳîh, a contemporary of Ibn Rustah, who wrote a very curious geographical miscellany, of which unfortunately only an abridgment has come down to us. Some of his notices of places, however, are of use in completing or correcting the earlier accounts[1].

[1] The texts of Ibn Khurdâdbih, Ḳudâmah, Ya'ḳûbî, Ibn Rustah and

The systematic geographers begin with the 4th (10th) century. They describe fully and in turn each province of the Moslem empire, only incidentally giving the high roads, and generally piecemeal for each province. Their works are of course a great advance on the Road Books; to them we owe such fulness of geographical detail as will be found in the following chapters, and the three first names on the list, Iṣṭakhrî, Ibn Ḥawḳal, and Muḳaddasî, are those to whose labours we are most materially indebted. The work of Ibn Ḥawḳal is but a new edition, partly enlarged and emended, of Iṣṭakhrî; on the other hand Iṣṭakhrî, a native of Persepolis, gives the description of his native province, Fârs, in far greater detail than is to be found in Ibn Hawḳal, who reduced his chapter on Fârs to the due proportion of the remainder of the book. Muḳaddasî, their contemporary, wrote his geography entirely on independent lines, and chiefly from his personal observations of the divers provinces. His work is probably the greatest, it is certainly the most original, of all those which the Arab geographers composed; his descriptions of places, of manners and customs, of products and manufactures, and his careful summaries of the characteristics of each province in turn, are indeed some of the best written pages to be found in all the range of medieval Arab literature.

It is further to be remarked that to these last three systematic geographers we owe the exact identification of most of the names displayed on the accompanying maps. At the close of each chapter they give a table of 'the distances,' namely the stages or sections of the great high roads, already described, which crossed the province in question, and in addition to the high roads an immense number of cross-distances are added, going between

Ibn-al-Faḳîh are edited by Professor De Goeje in volumes V, VI, and VII of his series *Bibliotheca Geographorum Arabicorum* (Leyden, 1885—1892); further in vol. VI he has added a French translation, with many important notes, of the first two authorities. Of Ibn Serapion the text, describing Mesopotamia, will be found in the *Jour. R. Asiat. Soc.* for 1895, p. 9; and the MS. referred to is that in the British Museum, numbered Add. 23,379. Ya'ḳûbî, in addition to his work on geography, also wrote a history, the text of which has been edited by Professor M. T. Houtsma (*Ibn-Wâdhih, qui dicitur Al-Ja'qubî, Historiae*, Leyden, 1883), and this often contains valuable information in matters of geography.

neighbouring towns. These distances, plotted out and starting from known points, enable us to cover the map with a system of triangulation, by means of which the positions of some towns, long ruined, and the very vestiges of which have in many cases disappeared, can be approximately laid down; as, for instance, in the case of Tawwaj in Fârs, the ruins of which have not yet been identified, though their situation can now be fixed within narrow limits. Another writer of the 4th (10th) century is Mas'ûdî, who has left two works; the first for the most part historical, and well known under the title of *The Golden Meadows*; the second, a sort of commonplace book, full of curious details and notes, which is called *At-Tanbîh*, '*The Admonishment*[1].'

Coming to the 5th and 6th (11th and 12th) centuries, we have the works of two famous travellers, pilgrims, whose descriptions of the places they passed through are of considerable importance. Nâṣir, son of Khusraw, the Persian, in the middle of the 5th (11th) century went from Khurâsân to Mecca and back, visiting Egypt and Syria on his way out, and crossing Arabia on the homeward journey, and his diary, written in Persian, is one of the earliest works we possess in that language. Ibn Jubayr, the Spanish Arab, a century later made the pilgrimage starting from Granada; and his account of Mesopotamia, particularly of Baghdâd, is one of the most interesting that has come down to us. Dating from the beginning of the 6th (12th) century is another Persian work, called the *Fârs Nâmah* (Book of Fârs), describing most minutely that province, and invaluable as far as it goes. Also dating from the middle of this century we have the systematic geography of Idrîsî, who lived at the court of the Norman king, Roger II of Sicily. He wrote in Arabic, and very inconveniently has composed

[1] The texts of Iṣṭakhrî, Ibn Ḥawḳal, and Muḳaddasî form volumes I, II, and III, respectively, of the already-mentioned series of the *Bibl. Geogr. Arab.* (Leyden, 1870—1877). Of Mas'ûdî the text of the *Tanbîh* has been edited by Professor De Goeje in vol. VIII of the same series (Leyden, 1894); and a translation in French of this has been published (Paris, 1896) by Baron Carra de Vaux under the title of *Le Livre de l'Avertissement*. The history, called *The Golden Meadows* (Murûj-adh-Dhahab), was published (Paris, 1861), the Arabic text being given with a French translation, by Messrs Barbier de Meynard and Pavet de Courteille; the two last works under the auspices of the French Société Asiatique.

his description of the known world in 'Climates,' that is according to zones of latitude, whereby the various provinces are often divided up arbitrarily, Mesopotamia, for instance, being partly described in the 3rd Climate, partly in the 4th. He had, unfortunately for our purpose, no personal knowledge of Persia or the regions east of the Mediterranean, but had visited Asia Minor, then still a province of the Roman empire, and his description of this region would be invaluable, but for the fact that the place-names (by reason of incorrect MSS.) are in many cases illegible, or so corrupt as to be at present mostly beyond recognition[1].

Coming to the 7th (13th) century, the period of the Mongol invasion and the fall of the Abbasid Caliphate, we have the voluminous *Geographical Dictionary* of Yâḳût, a compilation it is true from earlier writers, but illustrated by the author's own far extended travels, which, when it is used with due criticism, is perfectly invaluable. The articles are arranged in alphabetical order, and Yâḳût quotes freely from almost all his predecessors in Arab geographical literature, some of whose works, as for instance those of the traveller Ibn-al-Muhalhal, who wrote in 330 (942), are only known to us by his excerpts. This great dictionary was epitomised, three-quarters of a century after its appearance, in a work called *Al-Marâṣid*, 'the Observatories,' and the author of this epitome, a native of Mesopotamia, often gives valuable corrections, of first-hand authority, for places in the regions round Baghdâd. Of about the same date is Ḳazvînî, who wrote a work in two parts on cosmography, which gives interesting notes on the products and the commerce of divers towns and provinces; and in the earlier part of the 8th (14th) century we have the systematic geography of Abu-l-Fidâ, a Syrian prince, who, though he compiled largely from the works of his predecessors, in addition gives

[1] The Persian text of Nâṣir-i-Khusraw, with an annotated French translation, has been brought out by C. Schéfer, in the series of the École des Langues Orientales Vivantes (Paris, 1881). The Arabic text of Ibn Jubayr was well edited by W. Wright (Leyden, 1852). The *Fârs Nâmah* exists only in manuscript: that quoted is in the British Museum, numbered Or. 5983. Idrîsî has been translated into French (indifferently well) by A. Jaubert (Paris, 1836); passages quoted I have verified with the Arabic text, preserved in the Bibliothèque Nationale, *Manuscrits Arabes*, Nos. 2221 and 2222.

facts from his own observation of the countries which he had visited[1].

Of the same date, namely the first half of the 8th (14th) century, are the travels of Ibn Baṭûṭah the Berber, who rivalled the Venetian Marco Polo in the extent of his voyages. His book is written in Arabic; his contemporary, Mustawfî, wrote in Persian a description of the Mongol kingdom of Îrân (Mesopotamia with Persia), which shows the condition of the country after the Mongol settlement, when this region was governed by the Îl-Khâns. Mustawfî also wrote an historical work called the *Târîkh-i-Guzîdah*, 'the Select History,' which, besides being of considerable value for Mongol times, often contains geographical notes of great importance[2].

For the time of Tîmûr we have primarily the notices in the historical work of 'Alî of Yazd, then the *Geography* written by Ḥâfiẓ Abrû; both are in Persian, and date from the first half of the 9th (15th) century. Lastly for the settlement after the conquests of Tîmûr, the works of two Turkish authors, one writing in Eastern Turkish, the other in 'Othmanlî, have to be mentioned, both being of the earlier half of the 11th (17th) century. These are the *History of the Turks and Mongols* by the Khwârizm prince Abu-l-Ghâzî, and the *Universal Geography* called the *Jahân Numâ*

[1] The *Mu'jam-al-Buldân*, the great dictionary of Yâḳût, has been edited in Arabic by F. Wüstenfeld (Leipzig, 1866—1873); the articles relating to places in Persia will be found translated into French, with additions from Mustawfî and later authorities, in the *Dictionnaire de la Perse* (Paris, 1861) of M. Barbier de Meynard. The *Marâṣid-al-Iṭṭilâ*, which is the epitome of Yâḳût, has been edited by Juynboll (Leyden, 1852). The two volumes of the *Cosmography* of Ḳazvînî have been edited by Wüstenfeld (Gottingen, 1848). The text of the *Geography* of Abu-l-Fidâ was edited by Reinaud and De Slane (Paris, 1840), and Reinaud also began (Paris, 1848) a translation of this work in French, prefixing to it a valuable Introduction on the Arab Geographers, which translation S. Guyard afterwards (Paris, 1883) completed.

[2] The Travels of Ibn Baṭûṭah, the Arabic text with a French translation, have been published (Paris, 1874—1879) by Defrémery and Sanguinetti. The Persian Geography of Ḥamd Allah Mustawfî (the text of the *Nuzhat-al-Ḳulûb*) was lithographed at Bombay in 1311 (1894), and the *Guzîdah* is quoted from the British Museum MS. numbered Add. 22,693, MSS. Add. 7630 and Egerton 690 having been collated. Part of the *Guzîdah* has now been printed, with a French translation, by M. J. Gantin (Paris, 1903).

(World Displayer) by the celebrated bibliographer Ḥâjj Khalfah[1].

For elucidating points of detail the works of many of the Arab historians are of primary importance. By earlier writers history and geography were often treated of in one and the same work. An instance of this is the *Book of the Conquests*, written by Balâdhurî, and dating from the middle of the 3rd (9th) century. It describes in turn, east and west, all the conquests of the Moslems, and is of great interest as showing the state of the country when Islam first became the dominant creed. Of the chronicles, besides the History written by Ya'ḳûbî, already mentioned, there is, dating from the 3rd (9th) century, the work of Ibn Mashkuwayh, of which the Sixth Section only has been printed. The annals of Ḥamzah of Isfahân, written in the middle of the 4th (10th) century, likewise give useful information, and though of course composed in Arabic. the work was evidently based on many Persian books, now lost, and it relates facts of which we should otherwise be ignorant.

The most complete, however, of the Arabic chronicles, down to the beginning of the 4th (10th) century, at which date he flourished, is that of Ṭabarî, and his work is for geography a primary authority. For later Abbasid history Ibn-al-Athîr has to be relied upon; also the entertaining summary of Moslem history generally known by the name of Fakhrî. The *Universal History* of Ibn Khaldûn is often of use to supplement the meagre chronicle of Ibn-al-Athîr; and the great *Biographical Dictionary* of Ibn Khallikân occasionally adds details. These authors all wrote in Arabic. In Persian the two histories called the *Rawḍat-aṣ-Ṣafâ* and the *Ḥabîb-as-Siyâr*, respectively by Mîrkhwând and by Khwândamîr

[1] The Persian text of the history of Tîmûr by 'Alî of Yazd, known as the *Ẓafar Nâmah*, is published in the Bibliotheca Indica (Calcutta, 1887). A French translation called *Histoire de Timour Bec* was published (Paris, 1722), by Petis de la Croix. Ḥâfiẓ Abrû exists only in manuscript; the one quoted is that of the British Museum, numbered Or. 1577. The Turkish text of the *Jahân Numâ* was printed in Constantinople in 1145 (1732) by Ibrâhîm Efendî, and a Latin translation of part of this work was published by M. Norberg (Lund, 1818). The Turkî text, with a French translation, of the History of the Mongols, by Abu-l-Ghâzî, has been published by Baron Desmaisons (St Petersburg, 1871).

his grandson, must be mentioned, for especially in the Persian provinces both these works give valuable geographical information. Two other Persian chronicles, relating to the Saljûḳ dynasties in Asia Minor and in Kirmân, are likewise of importance, and are more than once quoted in the following pages, being referred to under the names of the chroniclers Ibn Bîbî, and Ibn Ibrâhîm[1].

To complete our survey, a few pages in conclusion of this preliminary chapter may be devoted to some general remarks on the place-names which occur in the following chapters, and are set down on the maps. In the two provinces of Mesopotamia the great majority of the place-names are notably either Arabic or Aramaic, this last having been the common language of the people here, prior to the Moslem conquest. The Arabic names of towns generally have, or had, a meaning, as for instance Al-Kûfah, Al-Baṣrah, and Wâsiṭ. The Aramaic names, as a rule, are easily recognisable by their form, and by the termination in long â, for exampie Jabultâ; and the meaning of these too is generally not far to seek: e.g. 'Abartâ, 'the passage, or crossing place,' marking a bridge of boats; and Bâjisrâ, which is equivalent

[1] The text of Balâdhurî has been edited by Professor De Goeje (Leyden, 1866). He has also given us Ibn Mashkuwayh, forming the latter part of his *Fragmenta Historicorum Arabicorum* (Leyden, 1871). The History by Ḥamzah of Isfahân has been edited (with a Latin translation) by I. M. E. Gottwaldt (Leipzig, 1844). The numerous volumes of the great Chronicle of Ṭabarî have been published, in three series, under the editorship of Professor De Goeje (Leyden, 1879—1901). The Chronicle of Ibn-al-Athîr is edited by Tornberg (Leyden, 1867—1876). Fakhrî, more correctly named Ibn-aṭ-Ṭiḳṭaḳâ, has been edited by Ahlwardt (Gotha, 1860). Of Ibn Khaldûn, the text quoted is that printed at Bulâḳ in 1284 (1867): the text of Ibn Khallikân has been edited by Wustenfeld (Gottingen, 1837), and an English translation was made by De Slane, for the Oriental Translation Fund (London, 1843). The references to the Persian texts of the histories by Mîrkhwând (or Amîrkhwând) and by Khwândamîr are to the lithographed editions, published in Bombay, of the *Rawḍat-aṣ-Ṣafâ* in 1266 (1850), and of the *Ḥabîb-as-Siyâr* in 1273 (1857). The two Saljûḳ chronicles are edited by Professor Houtsma in vols. I and IV of his *Recueil de Textes relatifs à l'Histoire des Seljoucides* (Leyden, 1886—1902). The first of these is by Ibn Ibrâhîm (otherwise called Muḥammad Ibrâhîm, or Muḥammad ibn Ibrâhîm), who flourished about the year 1025 (1616); and the second chronicle is by Ibn Bîbî, who wrote about 680 (1281). See also an article by Professor Houtsma in the *Zeit. Deutsch. Morg. Gesell.* 1885, p. 362.

to the Arabic Bayt-al-Jisr, meaning 'bridge-house.' Older Persian names like Baghdâd, 'the god-given place,' are rare; and here and there a Greek name survives, as for instance Al-Ubullah, representing Apologos.

The Greek province of Asia Minor, as already said, only became Moslem land after the Saljûḳ conquest, in the latter half of the 5th (11th) century; and hence the Greek names are often known to us in two forms, an earlier (Arabic) and a later (Turkish); as, for example, Seleucia given first as Salûḳîyah, later as Selefkeh; and Heraclia which we find at first as Hiraḳlah, and in more modern times as Arâkliyah. After the Saljûḳ occupation of the country and the subsequent Ottoman supremacy, Turkish names naturally come to supplant the earlier Greek nomenclature; but in the matter of orthography it must be remembered that the Arabic alphabet is quite as foreign to Turkish as it is to Greek, hence Turkish words (as every Turkish dictionary shows) often have alternative spellings, and the place-names are in like case. Thus we find both Ḳarâ Ḥiṣâr and Ḳarah Ḥiṣâr; Ḳarah-sî and Ḳarâsî; Ḳaramân and Ḳarâmân, with many other examples.

Looking over the maps of the Persian provinces, it is striking how few names there are of Arabic origin. With the exception of Marâghah in Adharbâyjân, and the hamlet of Bayzâ (Al-Bayḍâ, 'the white town') in Fârs, there is hardly an Arabic town name to be met with. The Moslems indeed changed little or nothing when they took over the Sassanian kingdom[1]. Very often villages and post-stations had names taken from some natural and notable object; as for example Myrtle village, Camel village, and Salt village; which in Persian were called Dih Murd, Dih Ushturân, and Dih Namak. These names the Arab geographers constantly

[1] It has been remarked that in all Moslem Spain, where rich cities abounded, there is only one that bears an Arabic name, to wit the port of Almeria, for Al-Maîîyah, 'the Watch Tower.' A place-name like Calatayud, which might be taken for another instance, is not primarily the name given to the *town*, but was only the fortress—*Ḳal'at Ayyûb*, Job's Castle—below which a town afterwards sprang up. In many cases the original Iberian, Roman, or Visigothic name is for lack of documents unknown; as for instance in the case of Granada. *Mutatis mutandis*, the same remarks apply to Persia.

translate, and in their pages we find the above, for instance, given as Ḳaryat-al-Âs, Ḳaryat-al-Jamâl, and Ḳaryat-al-Milḥ, but there is every reason to believe that in Persia, at all times, the Persian name was in use; in other words it is here, as with us, when we speak of the Black Forest (Schwarz-Wald) or the Cape of Good Hope, such names likewise commonly varying on the maps, and in books, according to the language of the speaker.

It will be observed that we have sometimes in the Arabic lists the name of a post-stage, in Arabic, of which the Persian equivalent has not come down to us; e.g. in the case of Râs-al-Kalb, 'Dog's Head,' possibly the place later called Samnân. Also occasionally the Arabs gave a nickname to a Persian town, and both names continued simultaneously in use; as for instance Kanguvâr, which from the stealing of their mules here the early Moslems had called Ḳaṣr-al-Luṣûṣ, 'Robber Castle'; but Persian Kanguvâr has in the end survived the Arab nickname. Even when the Moslem conquerors founded a new provincial capital, as was the case with Shîrâz, which soon came to eclipse the older Iṣṭakhr (Persepolis), they seem to have taken and perpetuated in the new town the name of the original Persian village. The origin and etymology of the name Shîrâz, like many others, appears to be unattainable, for unfortunately the geography of the old Sassanian kingdom is almost entirely unknown to us.

The pronunciation of names, as is natural, varied with the lapse of time; Ṭuraythîth becomes Turshîz: Hamadhân is in later books spelt Hamadân[1]; further there was evidently an Arabic and a Persian pronunciation (or spelling) of the same name contemporaneously current, thus Arabic Ḳâshân is written Kâshân in Persian, Ṣâhik appears later as Châhik, and Ṣaghâniyân is Chaghâniyân. Then again, as the Arabic grammar demanded tri-consonantal roots, the Persian Bam had to be written in Arabic *Bamm*, and Ḳum *Ḳumm*; but this was merely to suit the rules of Arabic orthography, and the doubled final

[1] It is to be remarked that the *dh*, which the modern Persians pronounce *z* (e.g. Azarbâyjân, written Adharbâyjân), was apparently sometimes not given the *z* sound; thus Hamadhân is now called Hamadân, and never pronounced Hamazân. In Persian the Arabic *w* is generally, but not always, pronounced *v*, e.g. Ḳazwîn or Ḳazvîn.

consonant was never in use in the Persian. In some cases a name would fall into disuse for some unknown reason, to be replaced by another name, but Persian like the first; an instance occurs in Ḳirmâsîn or Ḳirmîsîn, later known as Kirmânshâhân, shortened to Kirmânshâh at the present day. But we are alike ignorant of the true import of these names, and the cause of the change.

In the matter of the prefixing of the Arabic article *Al* to place-names, the usage appears to be extremely arbitrary. The strict grammatical rule appears to be that the article is only prefixed to Arabic, not to foreign names. This rule, however, never was kept; for instance in Mesopotamia, where most of the names were of course of Semitic origin, the Tigris is always named Dijlah (without the article), but the Euphrates is Al-Furât, though this last is like the first a foreign word[1]. In the Persian provinces, the tendency was, with the lapse of time, to drop the Arabic article, e.g. (Arabic) As-Sîrajân becomes (Persian) Sîrjân. The usage however is quite arbitrary, for no explanation can be given why the ancient Rhages should be invariably called by the Arabs Ar-Ray, while Jay, the old name for one part of Isfahân, is always given without the article[2].

The Arabs were somewhat poverty-stricken in the matter of their nomenclature, and the lack is cause of much confusion. With them the capital of a province, as a rule, may be called by the name of the province, even when it has a name of its own; thus Damascus still is commonly known as Ash-Shâm, '(the capital of) Syria'; and Zaranj, the chief town of Sijistân, was

[1] Thus we have Al-Ubullah (an original Greek name) with the article, and a number of other instances occur. Purely Arab towns sometimes took the article, sometimes not; e.g. Al-Kûfah, said to mean 'the (city of the) Reed-huts'; but on the other hand, Wâsiṭ, 'the Middle-town,' is always written without the article, though here too it would have seemed equally appropriate.

[2] How little any rule holds is shown by the case of Jiddah, the port of Mecca, given both as Juddah, and as Al-Juddah by all the earlier writers. In the following pages where a place-name commonly occurs in the Arabic authors preceded by the article, this is, on first mention, so given. Subsequently, however, when the name is repeated, for the sake of brevity, and in the maps for distinctness, the article as a general rule is omitted. The use or disuse of the article varies with the different Arab geographers, and like their spelling of foreign names is the reverse of consistent.