

## SYMMETRY IN MUSLIM ARTS

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**Abstract**—The present article gives a brief summary of the manifestations of symmetry in Muslim arts. The material was collected in different Muslim countries and was selected in such a way as to show the existence of the basic patterns of symmetry in every branch of art and at the same time in every aspect of everyday life of the Muslim community.



Fig. 1. In the name of God, the Merciful, the Compassionate.

When one enters a mosque for the first time, what surely strikes the eye is the lack of paintings and sculptures so natural in our Christian culture. Instead, we find decorations of various kinds floating and curving along the walls, which are usually referred to as “geometric”. Certainly the reason of this great difference is not the inability of Muslim artists to describe living beings—but then what?

Nowadays, when—for political and economic reasons—so much attention is paid to the Arabic and Muslim world, it is common knowledge that the holy book of Islam, the *Quran*, forbids the description of beings having a soul. However, vast as the territory of the Muslim world once was and still is, the Muslims could not free themselves from the effects of the previous cultures flourishing in the parts of the world conquered by them, which fact resulted in several counterexamples to the above statement.

Consider the year 622 (the year of the emigration of the followers of Muhammad from Mecca to Medina), the beginning of Islam. We find that within a relatively short period—about 100 years—the Muslims conquered the Arabic peninsula, North Africa, Spain, Southern France (for a while), Sicily, the whole territory called the Middle East today, and penetrated into Central Asia and India. Several significant cultures were flourishing in these areas at the time, and their effects on the Muslim world and thought gave birth to such works of art as the beautiful Persian and Turkish miniatures and carpets, which are also full of descriptions of human beings. Nevertheless, firmly and powerfully as religion governed and still governs the life of the Muslim community, the prohibition of the *Quran* influenced Muslim arts very strongly.

What were the sources of this prohibition?

Muslim religious thought was greatly effected by the other two great religions of the territory, Judaism and Christianity, so much so that the 5 “pillars” of Islam have close connections with their regulations. The first “pillar”, the testimony (*shahādah*), is considered to be the most important, as it is the manifestation of Islam being a monotheistic religion, saying “There is no other god than God, and Muhammad is God’s prophet” (*lā ilāha illa-llāha wa muḥammad rasūlu-llāh*). The other “pillars”, the fasting (*ṣaum*); the prayer 5 times a day (*ṣalāh*); the poor tax (*zakāh*) and the pilgrimage to Mecca (*ḥajj*) which every Muslim must perform at least once in his life; are also clearly related to the basic concepts of Judaism and Christianity.

Prohibition of description has the closest relationship with the testimony, which is also



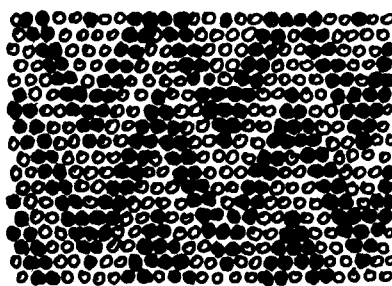


Fig. 2. Cone mosaics from Warka, Mesopotamia.

called "*tawhīd*", the profession of the unity of God. God being One and having no companion[1], it is only He, who has the power and ability of creation, the perfection of which Man can never reach. "*Al-muṣawwir*", one of His 99 attributes, means the Bestower of Forms and Colours and is derived from the same root as the word "*ṣūrah*" (picture)[2]. In the Arabic translation of the Old Testament this very word is used to denote the subject of prohibition[3], proving the relations and the interconnections of the great monotheistic religions referred to above.

Religion was not the only field where Arabs were influenced by other cultures. Their quick expansion brought them into conflict with the two great political powers of the time. Byzantium and the Sassanid Iran, both having a well-developed, flourishing culture: the former based on Hellenistic heritage and Christianity, the latter fostered and preserved the heritage of ancient Assyria and the Achaemenian empire. Muslim arts were influenced and inspired by both.

Sassanian art must be credited with the creation of a new style of abstract, pseudo-floral ornament, based on traditions of Assyrian and Achaemenian art, in which rhythmic repetition and symmetry are the main principles.[4]

This statement is illustrated by the examples below. The famous conic mosaics of Warka represent ever-returning patterns, while the row of flowers above the heads of the guards in the Persepolis Palace of Darius can be found in the oldest mosque of Cairo built by Ibn Tulūn (Figs. 2–5).

On the other hand, "Christian art of Egypt, Syria and Mesopotamia furnished models for a number of decorative schemes found in early Islamic monuments"[5]. On the walls of the Armenian Temple of Jerusalem the same motifs (Fig. 6) can be found as on the outer surface of the Dome of the Rock in Jerusalem (Fig. 7), which is a unique monument in Islam, erected by Caliph Abd al-Malik (685–705). The outline of the Dome is octagonal (Fig. 8). It was built on the site where the Temple of Solomon had stood, atop the rock, which—according to tradition—was that of the sacrifice of Abraham, whom the Arabs consider their ancestor. Besides its religious significance it is important from the point of view of the arts as well. It incorporates elements of Byzantine tradition, such as wooden stays connecting the capitals, the small dome,

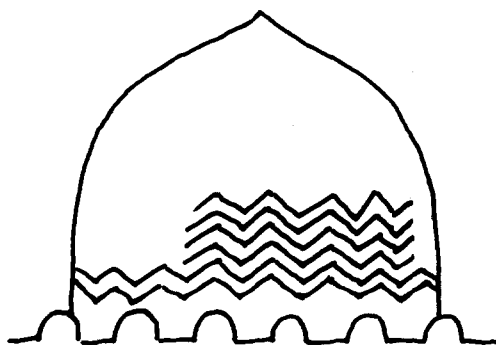


Fig. 3. The cupola of the Mu'ayyad Mosque, Cairo, Egypt.



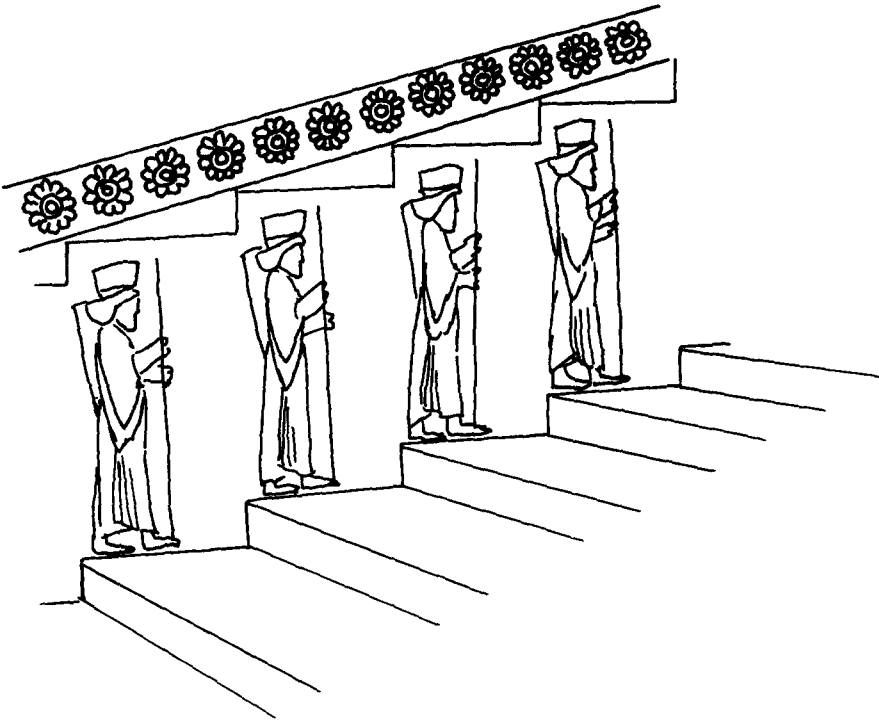


Fig. 4. The way leading to the audience hall of Darius I, Persepolis, Iran.

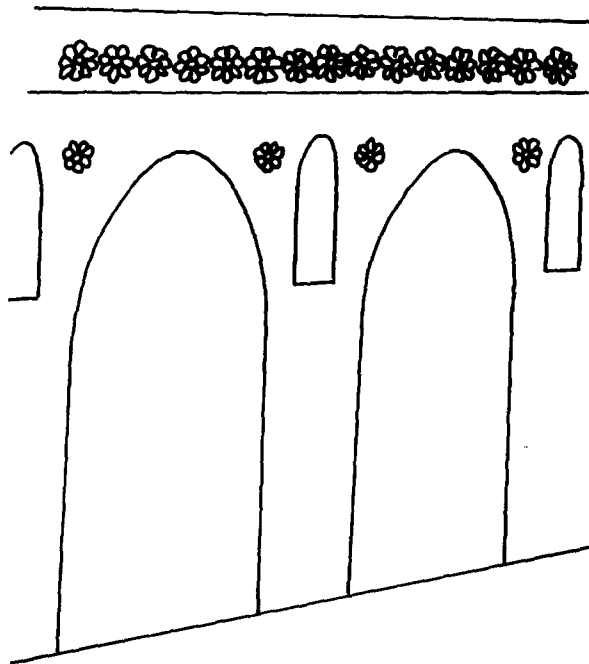


Fig. 5. Decoration from the al-Qatai Mosque built by Ibn Tulūn, Cairo, Egypt (876–79).



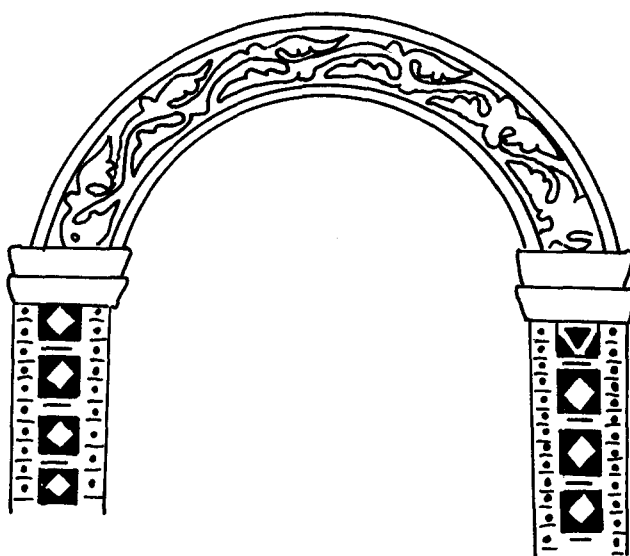


Fig. 6. Fragment of the Armenian Temple, Jerusalem, Israel.

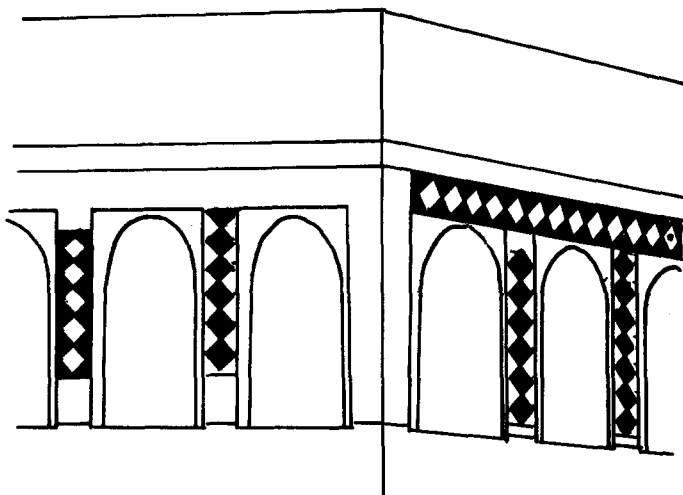


Fig. 7. Outer decorations of the Dome of the Rock, Jerusalem, built by Caliph Abd al-Malik (691).

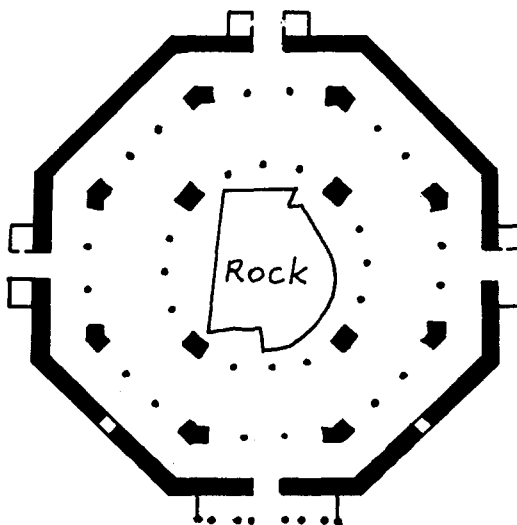


Fig. 8. The Dome of the Rock, built by Caliph Abd al-Malik.



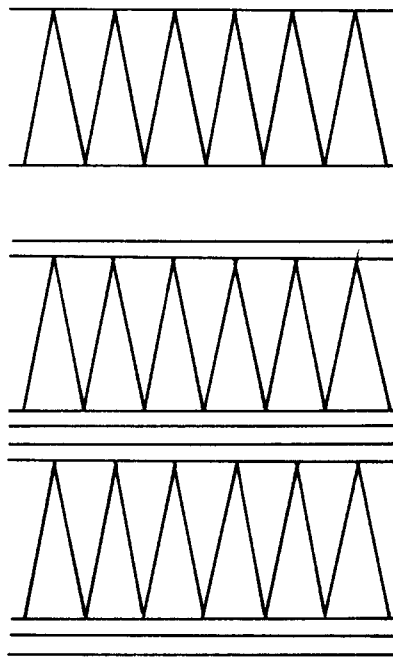


Fig. 9. Decoration from the golden lyre with the bull head, Ur, Mesopotamia.

the widespread use of mosaic ornamentation, and of Sassanid arts, as the cornice with small arches, twin colonettes and the royal symbols of crowns and jewels, which are characteristic of both traditions. All these borrowed marks are used together with the inscriptions, which are among the most characteristic elements of Muslim arts. In Oleg Grabar's opinion "these mosaics proclaim the military victory over Islam's two early enemies, Byzantium and the Sassanid Iran" but also the victory over Judaism and Christianity and "project the spread of the new universal Religion." [6]

Although, when speaking about arts in ancient times, we usually refer to temples and palaces, we must not forget the humble and common objects of everyday life, such as pots, tools and musical instruments, found in excavations. The motifs decorating them are still very popular and widely used in present day folk art (Figs. 9–12).

The examples of "rhythmic repetition and symmetry" underlying Sassanid art and its predecessors, some of the geometrically arranged patterns of Christian art, and finally the extricate schemes to be found all over the Muslim world expose the question of the role of mathematics in Muslim arts. When we come across the manifestations of such a "geometric" art, we cannot help realising that an arranging principle, mathematics must have been used consciously there. It was

a means . . . by which man can arrive at the knowledge of the Essence; his knowledge of the basic structure of the material world, by which he is surrounded, makes it possible for him to arrive at the Essence of the secret of God Almighty's creative power. [7]

The spiritual world was reflected in the sensible world not through various iconic forms, but through geometry and rhythm, through arabesques and calligraphy which reflect directly the worlds above and ultimately the supernal sun of Divine Unity. [8]

Such a conscious usage of mathematics in works of art may surprise the laymen, who usually have not even the faintest idea how much present day sciences owe to the Arabs: from the so-

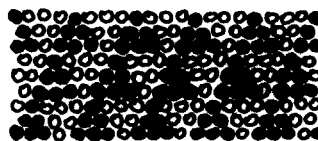


Fig. 10. Cone mosaics from Warka, Mesopotamia.



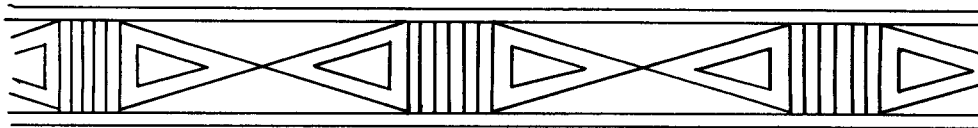


Fig. 11. Bracelet made of beads, Libya.

called "Arabic" numerals, (which were in fact of Indian origin but were transmitted to us by the Arabs), to the heritage of many a Greek scholar and scientist, whose work would have been lost to us, had not the Arabs translated them. And they did not stop at translating, they developed the knowledge thus acquired, and made significant contributions to several sciences, especially in the fields of Astronomy, Mathematics and Medicine. Sciences and arts were cultivated on a high level at the courts of the caliphs, princes and petty rulers, who found pleasure in patronising the leading scientists and artists of their age.

At the same time we must not forgo the important role that the representatives of Mathematics, the numbers, must have played outside the courts, among less or uneducated people. They were and still are the constant companions of everyday life. They were given magic values and powers, and as such were considered something beyond human reach. For example the number 5 has a lot of occurrences in the life of an average Muslim. Islam has 5 "pillars"—a Muslim has to say his prayers 5 times a day—the so-called "Fatima hand" has 5 fingers (Fig. 13), imitating a real hand, but having magical significance: it defends its holder from the bewitching of the evil eye. If one feels that somebody wants to cast an evil eye upon him, he must say "*khamsah fī 'aynak*" meaning "5 into your eye", thus breaking the force of the evil.

Having summed up all these effects and phenomena, now we examine them in their manifestations in the works of art, looking for "symmetry, or the series of ways in which a single motif can be repeated an exact number of times within a circle," which "is the most fundamental manifest aspect of Islamic geometric art." [9] As Muslim art can be geometric in its every branch, examples of symmetric nature will be presented from the simplest patterns to the most elaborated ones and they will be grouped according to the field of art they belong to.

Architecture—partly science, partly art—has a lot of symmetrical features even to the eye of a layman. They are so natural and we are so accustomed to them that walking in the street we usually do not even realise that the buildings we see are symmetrical. As early as ancient times there were efforts to reach "perfect" forms, the most well-known of which are the

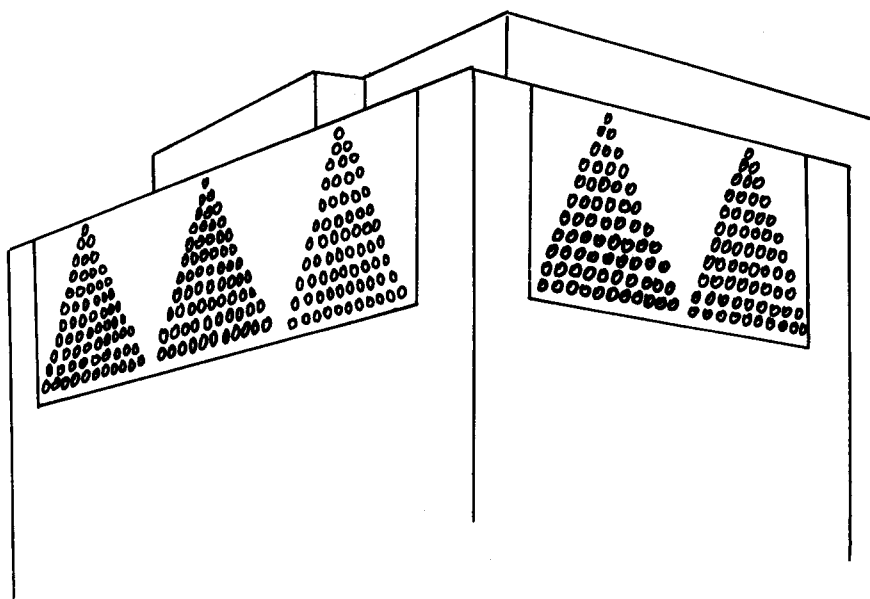


Fig. 12. Fragment of a common living house in Jerusalem.



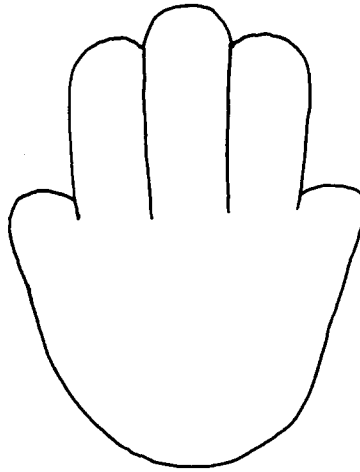


Fig. 13. Outline of a Fatima-hand made of copper, Libya.

Pyramids of Gizah in Egypt. In the Middle East the circular design had great traditions, because of the cosmological and magical significance attached to it. In 762, when Caliph al-Manṣūr founded his new capital, Baghdad, it was also of this circular design (Fig. 14). However, the designs are often rectangular whose mirror planes are perhaps the most frequent manifestations of symmetry, clearly recognisable even for the man in the street. So much so that in everyday speech when using the word “symmetry”, we usually refer to this type (Fig. 15).

To our minds Muslim architecture usually means mosques and minarets; and though we usually do not realise how much an Egyptian minaret may differ in shape and form from a Turkish one—walking in the Fatimid part of Cairo we find minarets of angular type, while the Turkish ones look like well sharpened pencils, the shape best known here in Hungary, too, as we also have some left from the days of the Turkish occupation. We will agree on one thing: the general concept of the minaret is that it should be tall and slim. At least that is how we would describe it, were we to sum up its main characteristics in words. However, the minaret of the Great Mosque of al-Mutawakkil at Samarra is of a different shape; it looks like a conical helix (Fig. 16), wide at the bottom and narrowing towards the top. This pattern, though described in the plane, has earlier parallels on a pot from Hacilar in Anatolia (Fig. 17) and in the beard of a statue from Assur-nasir-apli’s Northwest Palace in Nimrud (Fig. 18). The design of the minaret in the Topkapi Sarayi, Istanbul, follows the spiral pattern: the diameter of the circles is unchanged all along (Fig. 19).

But even minarets “simple” in shape could be decorated in such a way as to give us examples of various classes of symmetry. This is the case of the minaret of the Selimiye Mosque in Edirne (Fig. 20), which represents the same class of symmetry as the carved window of the cupola of the Shah Mosque at Isfahan (Fig. 21).

Cupolas, as we have seen above, could be equipped with windows looking like lace of stone—a common feature even with living houses, but there they were usually made of wood. The cupolas, however, were more often tiled or carved (Figs. 22–23). These structures are usually mounted over the central prayer hall, which may have several aisles separated by rows of columns sometimes connected by nicely shaped arches (Fig. 24).

Walking in the Fatimid part of Cairo, one cannot help recognising the ever-returning ridge ornaments. They vary from the relatively simple ones like that of the Azhar Mosque (Fig. 25), which has an ancient parallel on the top of the Ishtar Gate originating from Babylon (Fig. 26) to more sophisticated, floral ones, as that of the Ghuriyya (Fig. 27). Niches built into the sides of the mosques were also a characteristic feature (Fig. 28) having parallels from the Sassanid Iran as well (Fig. 29).

As we have already mentioned, tiles were frequently used in decorations both inside and outside of buildings, especially in eastern Islam, Iran and Central Asia. Turkey was famous first for her Iznik, then for her Kütahya tiles, which were even taken to Cairo to decorate the



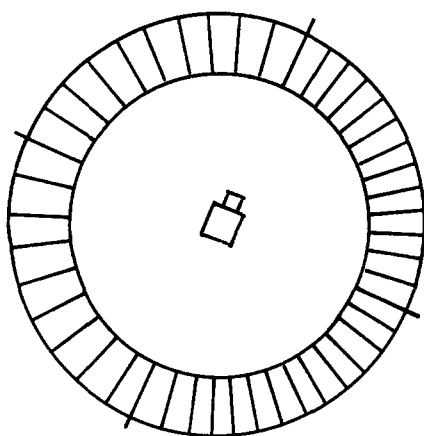


Fig. 14. Design of the new capital of Caliph al-Manşūr, Baghdad, Iraq, founded in 762.

Blue Mosque there, which has the same sort of tiles as the Sultanahmet Mosque in Istanbul—usually referred to as *the* Blue Mosque, because of the colour of its tiles. But palaces were also often covered with tiles; perhaps the most famous example is the Topkapı Sarayı, in Istanbul, which has a great variety of tiles (Fig. 30).

The mosaics from Iran presented below are of a somewhat different kind, though they are also ornamented by floral patterns, our sketches can only indicate their main outlines (Figs. 31–32).

Beside the tiles and mosaics, carving was also a popular and widely used device. Muslim artists often created so sophisticated patterns that sometimes it is difficult to follow all the turns of the lines. In a given decoration several interwoven patterns may be combined, which are highly symmetrical within themselves (Fig. 33).

The ceramics used in contemporary life such as cups, plates and even ash-trays may have decorations originating from the early times (Fig. 34).

There are numerous examples of symmetries characterised by periodicity in two directions. They were applied to decorations covering extended surfaces of walls, floors and columns. We have already seen some examples above (e.g. Figs. 30–32) and more are given below (Figs. 35–37).

The designs were not carved always into stone: woodwork was also highly developed. A very special sort of decoration was that of the *Quran* stands, used to hold the copy of the holy

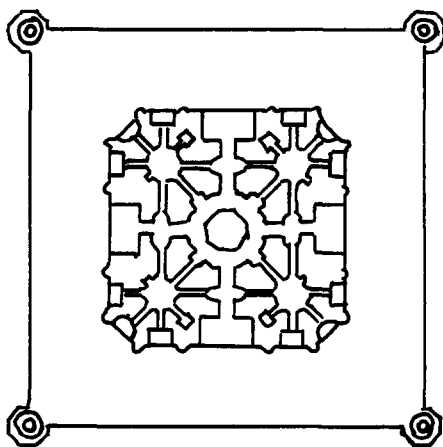


Fig. 15. Design of the tomb of the Tāj Mahal, “the crown of the palace”, Agra, India (1632–1648).



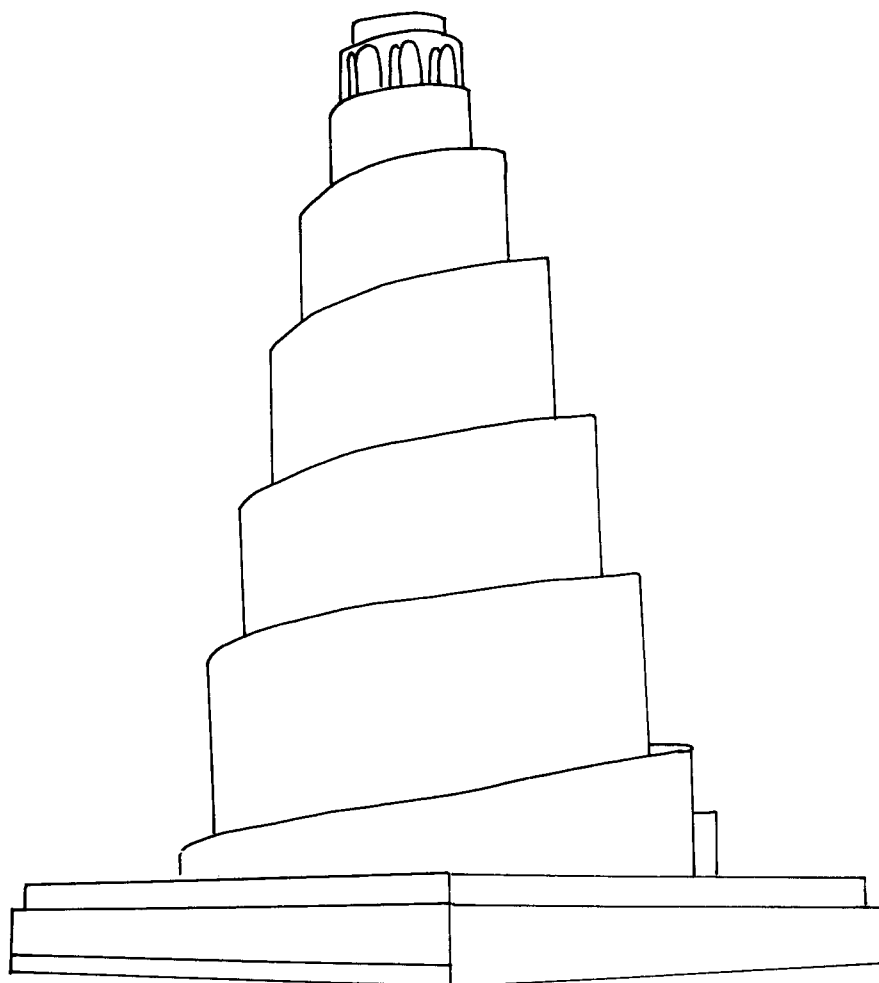


Fig. 16. Minaret of the Great Mosque at Samarra.

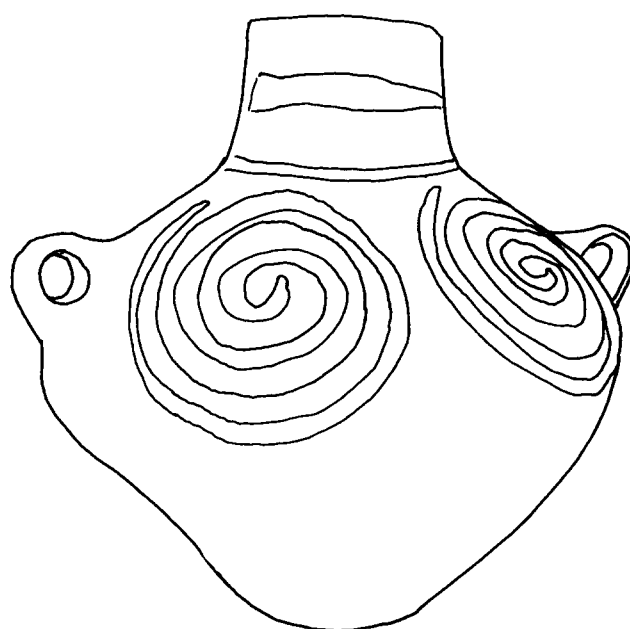


Fig. 17. Terracotta pot from Hacilar, Anatoly, 6th c.B.C.



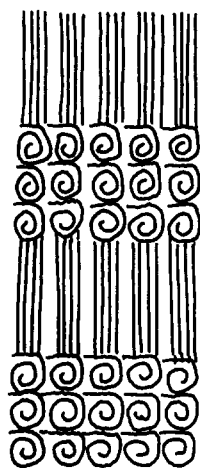


Fig. 18. Beard of a giant guardian from Assur-nasir-apli's Northwest Palace, Nimrud, Assyria, 9th c.B.C.

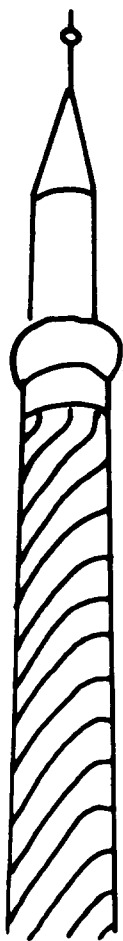


Fig. 19. A minaret from the Topkapı Sarayı, Istanbul, Turkey.

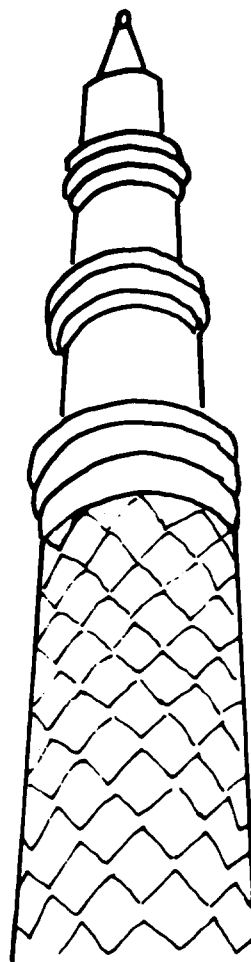


Fig. 20. Minaret of the Selimiye Mosque, Edirne, Turkey.



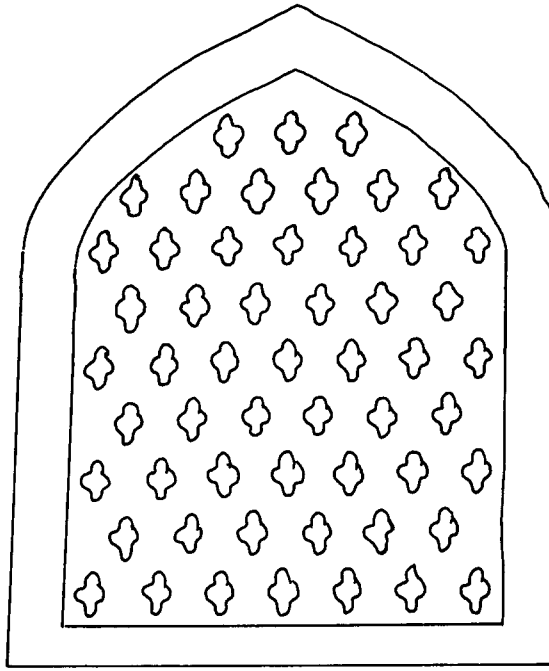


Fig. 21. The Shah Mosque, carved window of the cupola, Isfahan, Iran, 17th c.

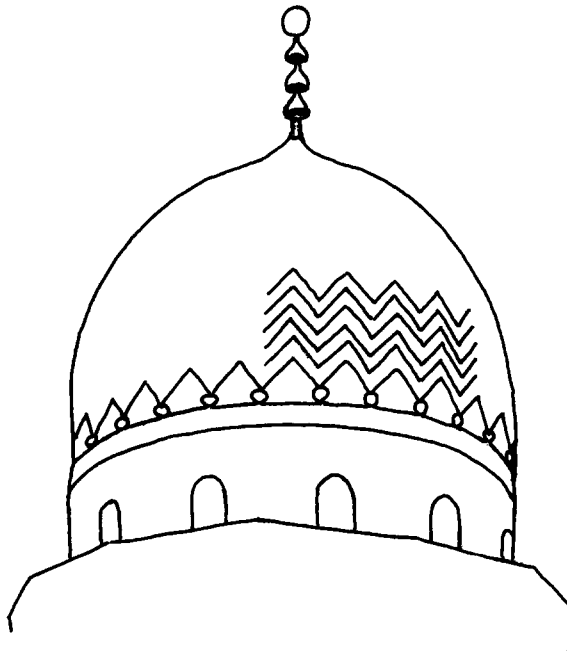


Fig. 22. The tomb of Amir Sulayman, Cairo, Egypt, 1544.



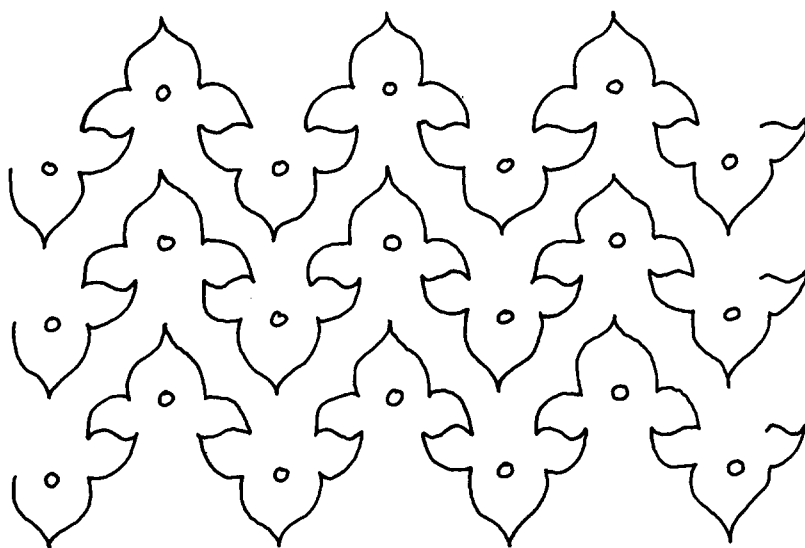


Fig. 23. Decoration of the cupola of the tomb of Azrumuk, Cairo, Egypt.

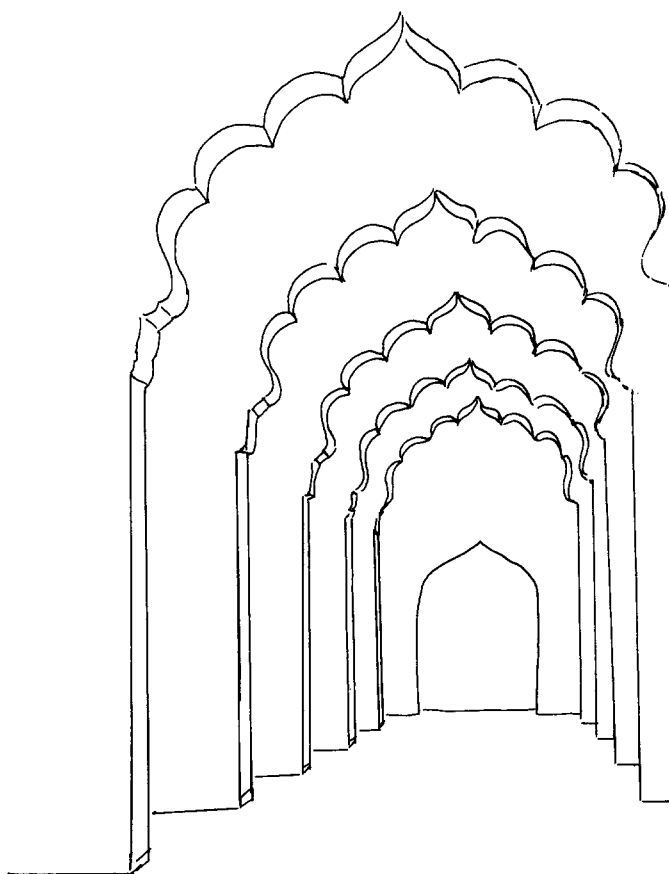


Fig. 24. View of the Moti Masjid's prayer hall, Agra, India, 17th c.



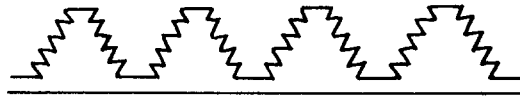


Fig. 25. Ridge of the Azhar Mosque, Cairo, Egypt.

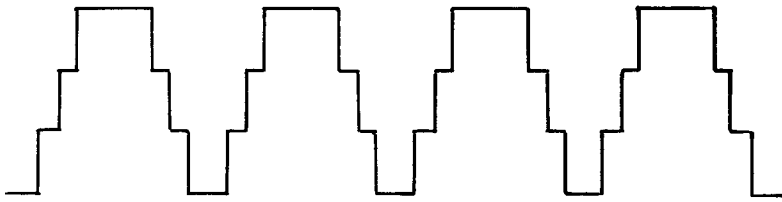


Fig. 26. Ridge of the Ishtar Gate from Babylon.

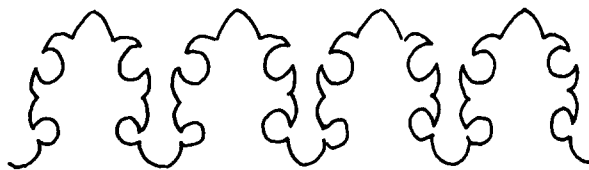


Fig. 27. Ridge of the Ghuriyya, Cairo, Egypt, 1500–1516.



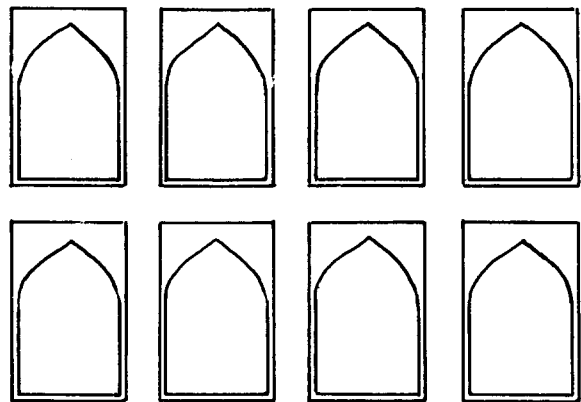


Fig. 28. Masjid-i Shah, Isfahan, Iran (1611–16).

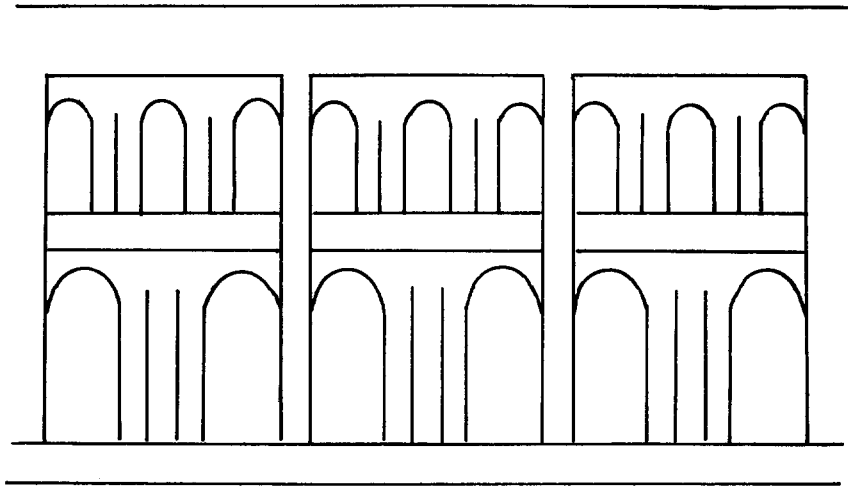


Fig. 29. Taq-i Kisra, the Hall of Khosrou, Ctesiphon.



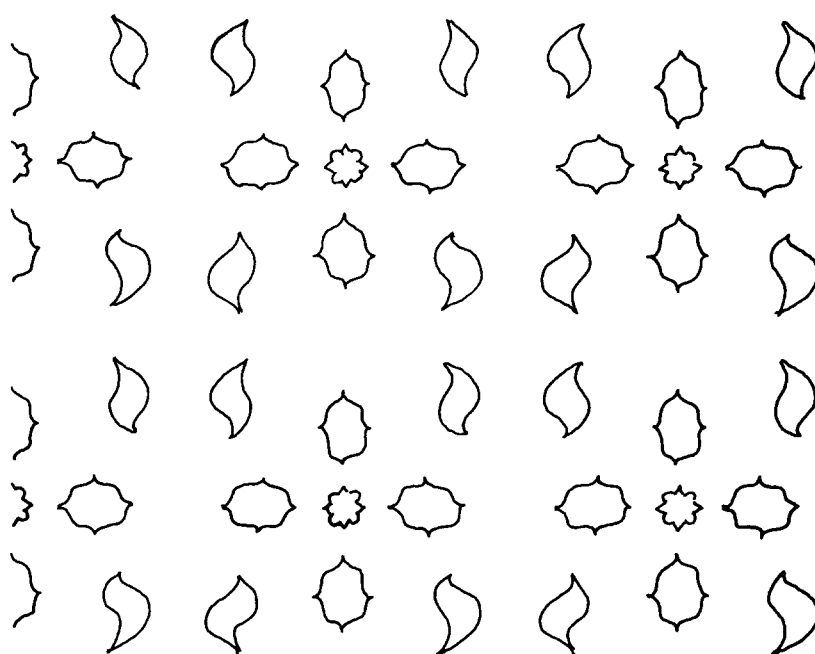


Fig. 30. Tiles from the Topkapı Sarayı, İstanbul, Turkey.

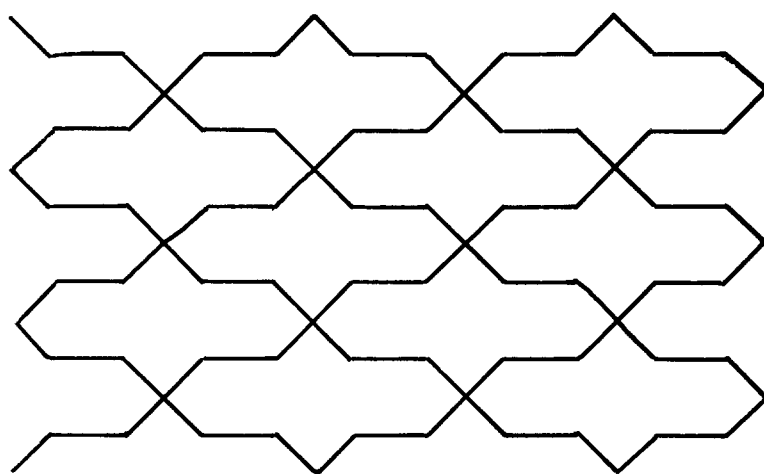


Fig. 31. Mosaics from the Gulistan Palace, Tehran, Iran.



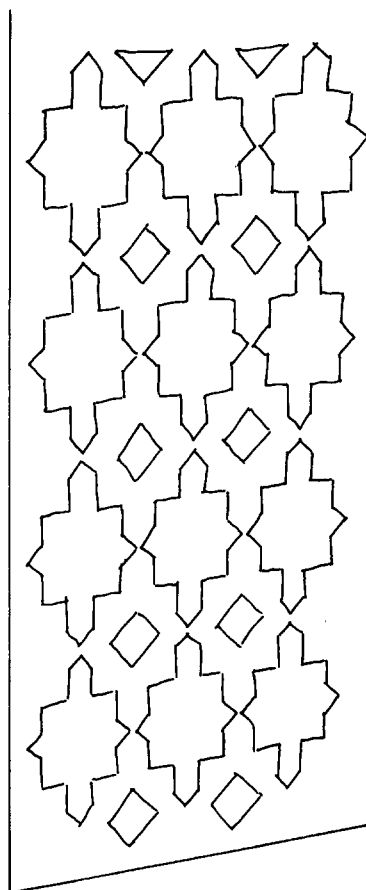


Fig. 32. A corner of the Blue Mosque, faience mosaic decoration, Tabriz, Iran, 1462–65:

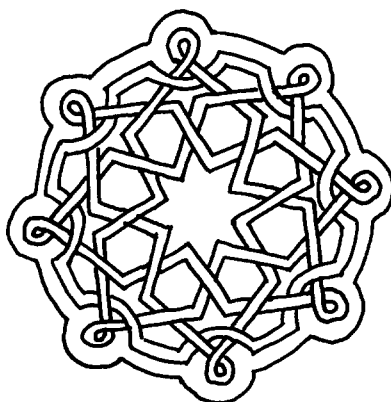
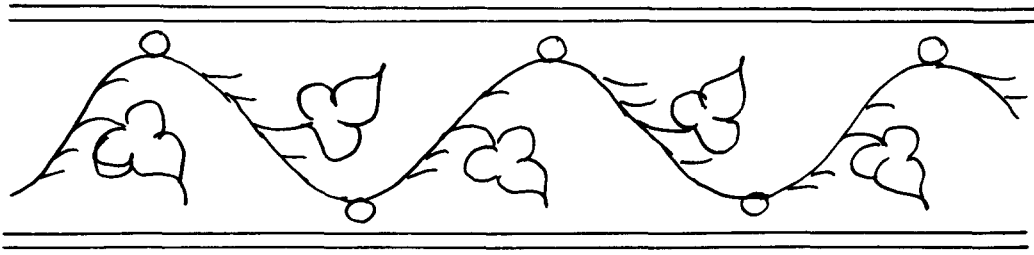
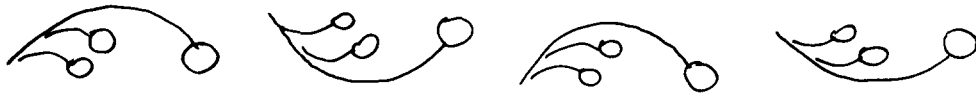


Fig. 33. Carving from the well of the Mu'ayyad Mosque, Cairo, Egypt, 1416–1420.

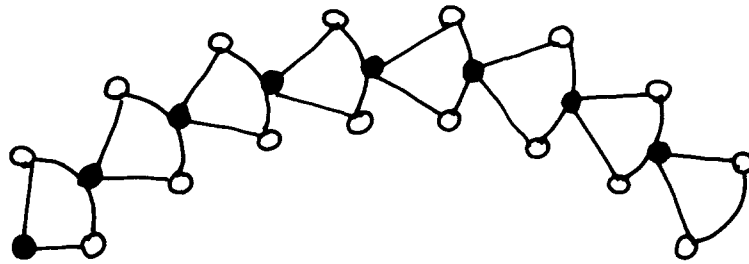




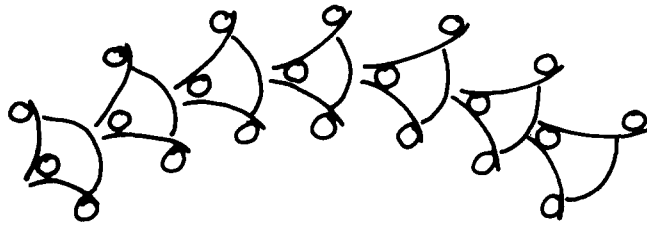
Painted Cup



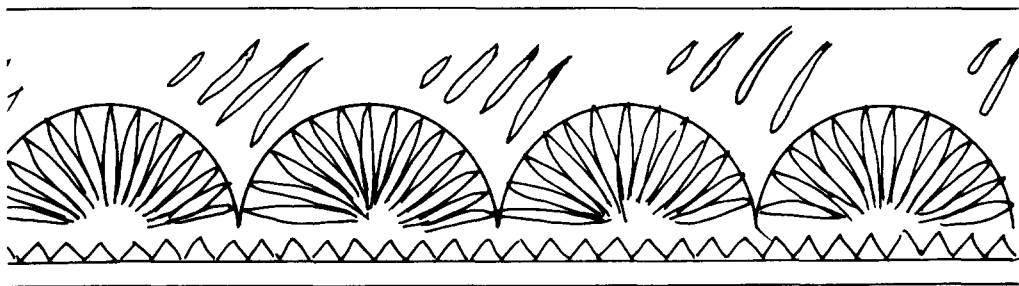
Painted Ash-tray



Painted Plate



Painted Plate



Carved Cup

Fig. 34. Decorations on present-day cups, plates and ash-trays, Tunisia.



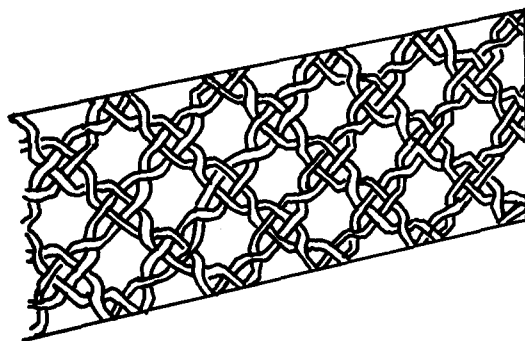


Fig. 35. Carved decoration from the Aḥmad Pasha Mosque, as-Saray al-Ḥamra, Tripoli, Libya.

book while reading or reciting from it. They usually bear the name of God or some quotations from the *Quran*. The example here (Fig. 38) has the name of God carved onto it.

Another device is inlay work, which is frequently used with wood. Walking in the bazaars of Egypt and Syria, we can find a great variety of handmade boxes, plates or small tables inlaid with mother-of-pearl (Figs. 39–40). Inlay work was also used with several materials other than wood (Figs. 41–42). In India it was used to decorate outer surfaces of buildings as well (Figs. 43–44).

Another common thing to be found in every bazaar, which is also inseparable from our concept of the Middle East, is carpets. They are manufactured all over the Muslim world. Carpets of Bukhara or Iran are as famous as the Berber ones of North Africa, the Maghreb. They are woven by hand in small “workshops” usually open to the visitor. Several types can be distinguished not only according to place, but also to patterns, technique and material. Here I would like to present carpets of more or less geometric design as it is easier for the eye to grasp their symmetry than it would be in the case of the meticulously floral patterns (Figs. 45–51).

Besides symmetry, there is another special characteristic feature of Muslim art, penetrating into every branch, and that is Arabic script, used any time and any place. Entering a mosque

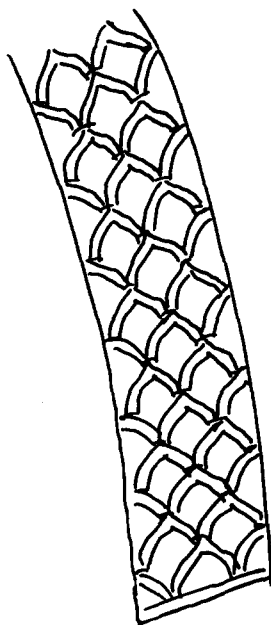


Fig. 36. A carved curve from the Aḥmad Pasha Mosque, as-Saray al-Ḥamra, Tripoli, Libya.



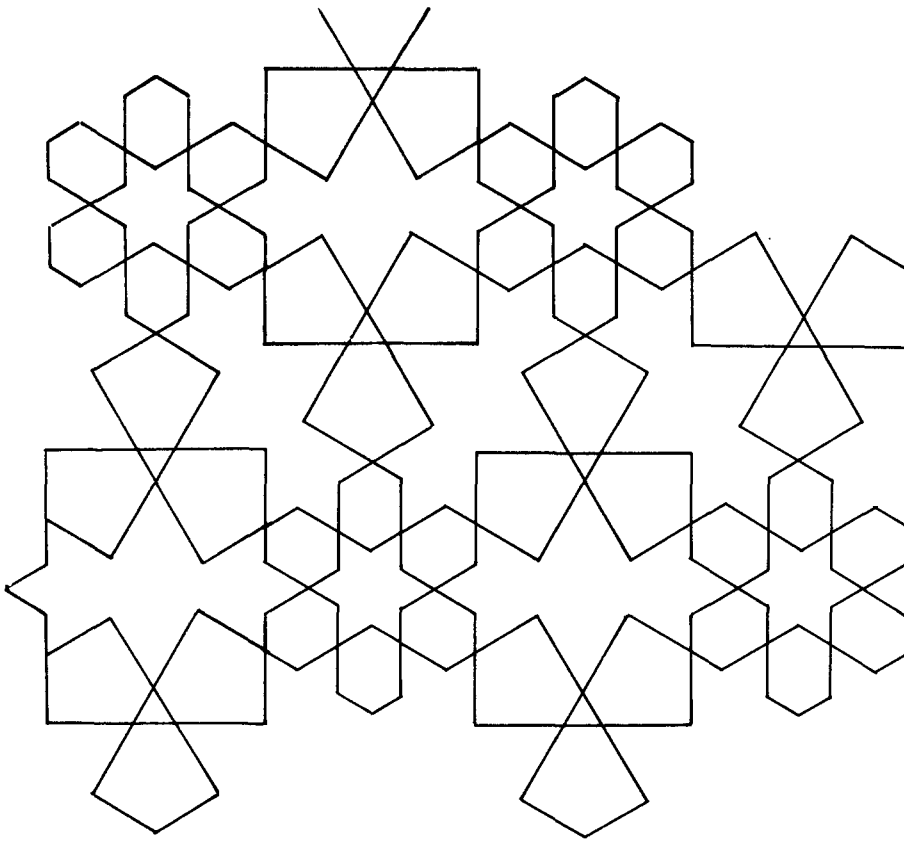


Fig. 37. Pattern from the mausoleum of Sayyida Rukhaiyah, Cairo, Egypt, 1154–1160.

or a palace, a public building or a common living house, even a person unable to read the Arabic script realises that the elaborated and artistic ribbons between the geometric and floral decorations represent some sort of writing (Fig. 52). Sometimes they are so richly decorated that it is difficult even to an eye accustomed to these letters to read them. We may even recognise that the forms of letters and their decorating elements are different in different mosques or places.

Calligraphy has developed into a much more meaningful and sophisticated art in the Muslim world than it has ever been in Europe. The famous calligraphers were always highly respected members of the courts and of the whole community. The reasons may be simple: illiterate people often render magic qualities to letters; and the Arabs, being a nomadic people, considered letters to be magical signs, which even after the rise of Islam preserved this magic significance—

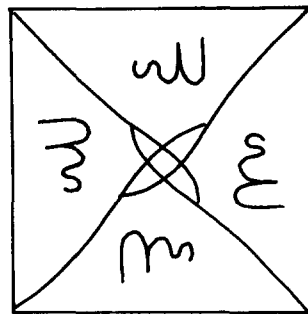


Fig. 38. Carved wooden Quran stand, Iran, 1360.



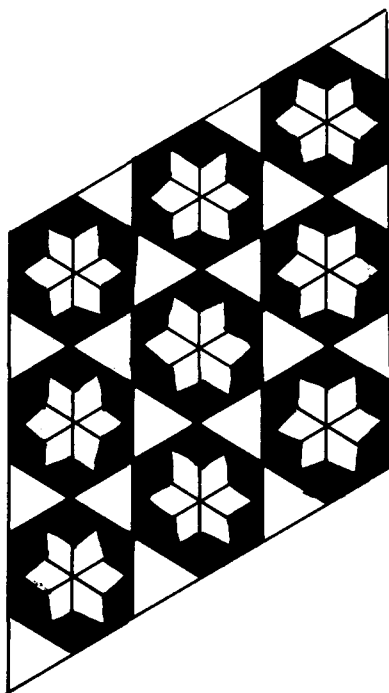


Fig. 39. Decoration of an inlaid box from Syria.

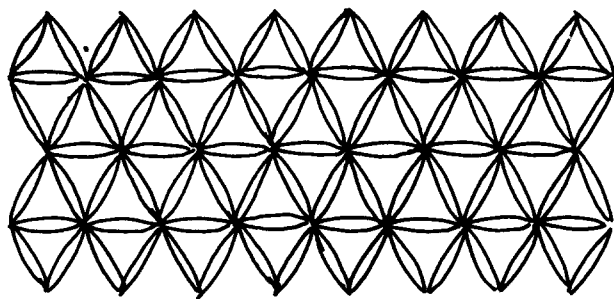


Fig. 40. Wooden box from Egypt, inlaid with mother-of-pearl.

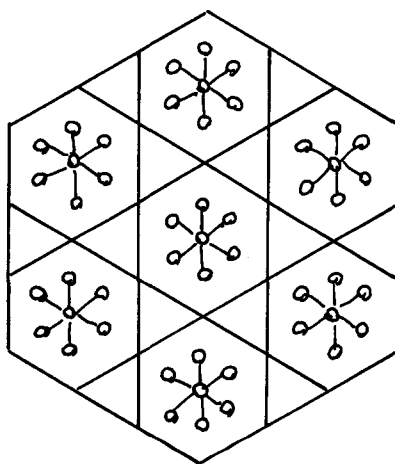


Fig. 41. Faience inlay work from the mausoleum of Gauhar Shād, wife of Shād Rokh, Herat, Afghanistan, 1432.



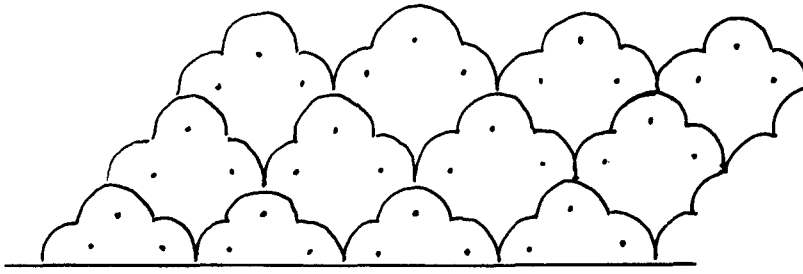


Fig. 42. Decoration of the back of a throne in the Topkapı Sarayı, İstanbul, Turkey.

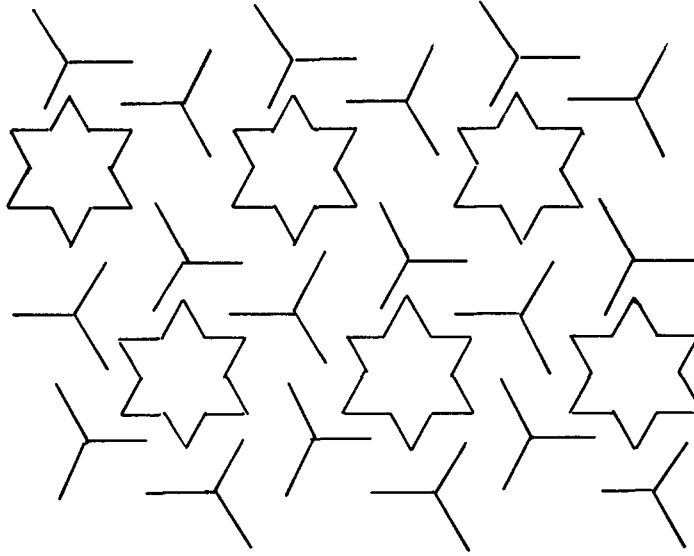


Fig. 43. Inlay work from one of the corner towers of the tomb of Itimād ad-Daula, Agra, India, 1628.

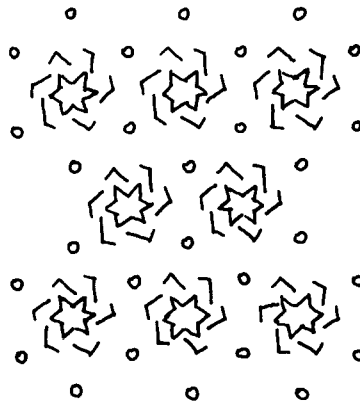


Fig. 44. Inlay work from the mausoleum of Itimād ad-Daula, Agra, India, 1628.

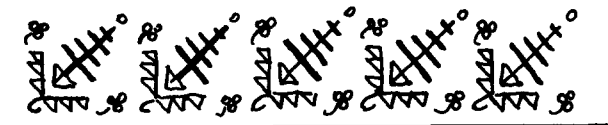


Fig. 45. Yağcıbedir carpet from Turkey.



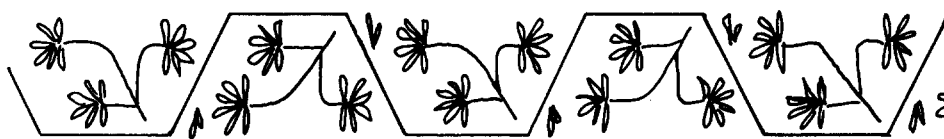


Fig. 46. Milas carpet, Turkey.

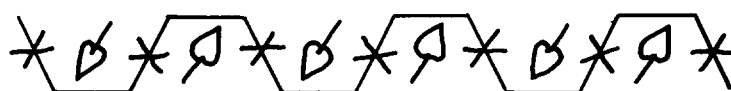


Fig. 47. Kula carpet, Turkey.



Fig. 48. Kula carpet from Turkey.

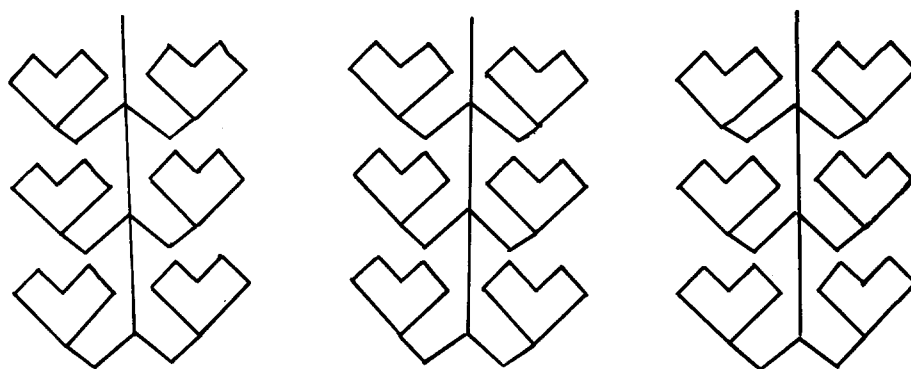


Fig. 49. Yağcıbedir carpet from the mountain villages of the Aegean region of Turkey.



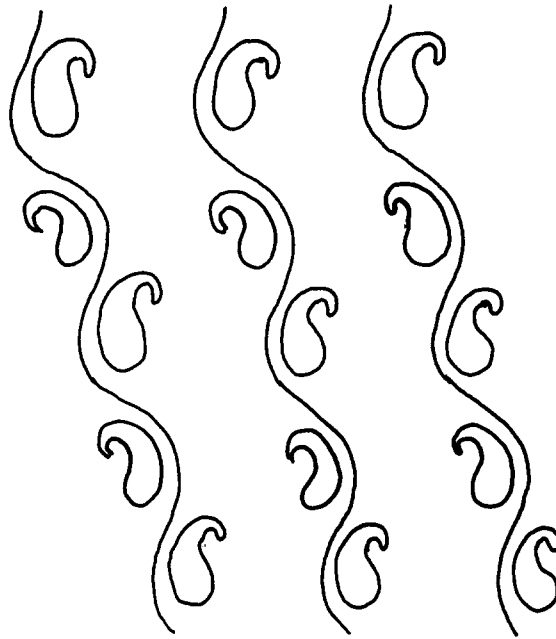


Fig. 50. A Persian rug from Khorasan.

traces of this can be found in the *Quran*. This respect, however, underwent a change, acquired a new meaning: the letters came to “embody the word of God as revealed in the sacred book, the Holy *Quran*.”[10] The rise of Islam urged the need to record the *Quran* precisely and to beautify it so that it became worthy of the divine revelation. These efforts resulted in several variants of Arabic script and are widely used in buildings and carvings, just as well as in books or any other branch of art. A tradition developed with the copies of the *Quran*: the first two pages of any copy are beautifully decorated, frequently displaying patterns of symmetry (Fig. 53).

The Arab calligraphers did not stop at the several variants of script. They formed them into different patterns and lines, sometimes interweaving several lines, sometimes playfully arranging the letters in symmetrical forms (Figs. 54–56). Sometimes a figure was formed from the letters of a name or a sentence, called “*ṭughrā*”. It was the calligraphic emblem used first by the Oghuz, then by the Seljuq rulers. It was later adopted by the Ottoman sultans, who developed it into a distinctive calligraphic art form (Fig. 57).

In these few pages I have tried to give a brief sketch of the importance of symmetry in Muslim art, to show that it is a basic feature which was and is present in every territory of the Muslim world, in every layer of the community and in every branch of art. We can visit palaces or museums, or walk in the poorest districts of any town or village of the Muslim countries,

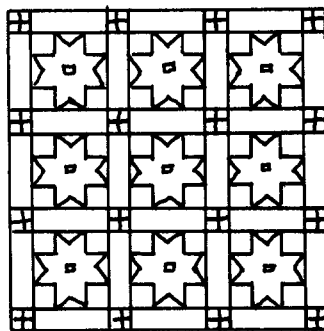


Fig. 51. A Persian rug from Shiraz.



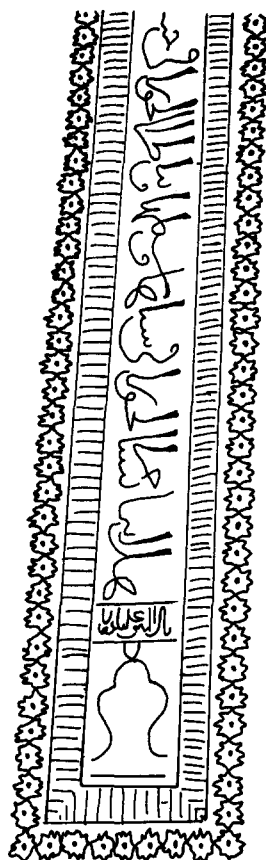


Fig. 52. Inscription decorated tiles.

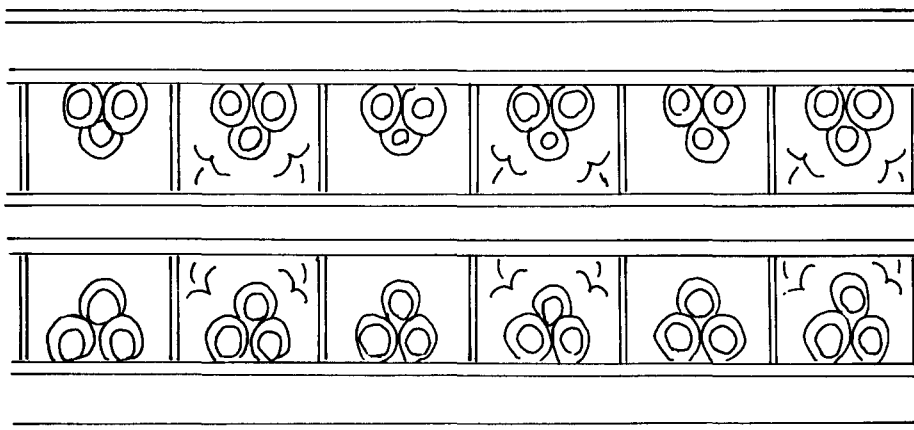


Fig. 53. Painted decoration from a copy of the Quran, from Qetta village, Fezzan, Lybia.

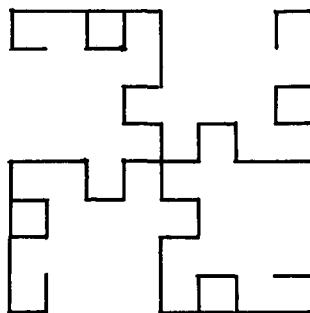


Fig. 54. Ornamental Kufic inscription from the mausoleum of the astronomer Ghazi-Zade Rumi in the necropolis of Shah Zinde, Samarkand, USSR, 1437.



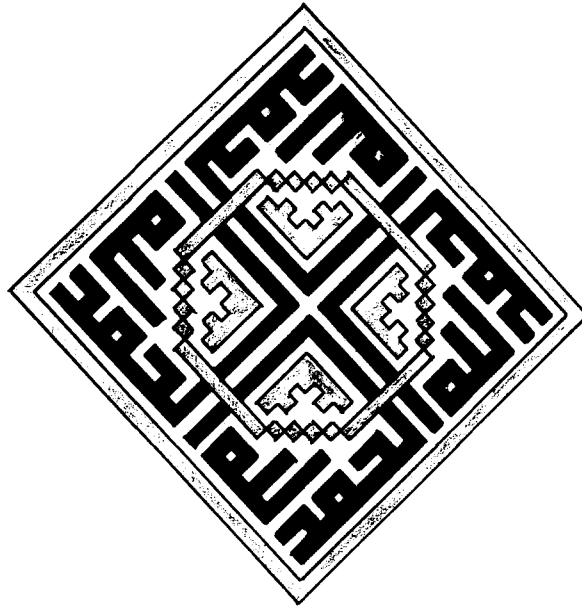


Fig. 55. Painting saying "Praise be to Allah."

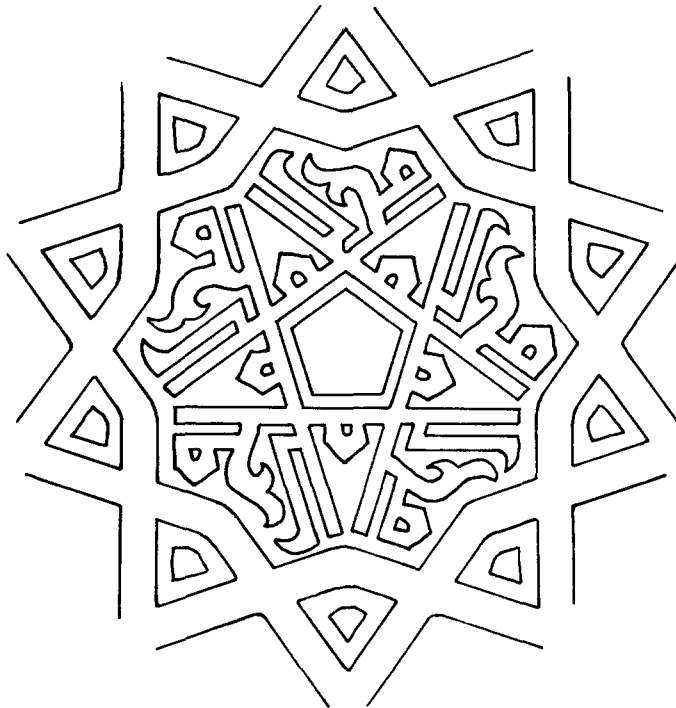


Fig. 56. Five-fold "square" Kufic inscription from the mausoleum of Öljeitu at Sultaniye, Iran (1310–16) with the name of the Prophet Muhammad.



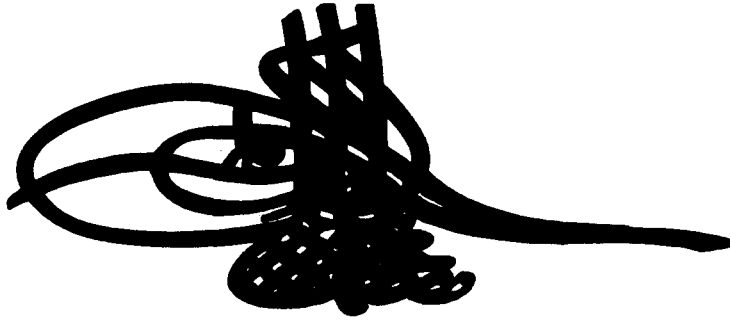


Fig. 57. The tughrā of Sultan Mahmud II.

and we will always find manifestations of symmetry everywhere. This article presenting such a consciously geometric and symmetrically designed art, perhaps will help us realise symmetry in our own life and surroundings as well.

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2. Sūrat al-Ḥaṣḥar, 59, ā.24.: *al-muṣawwir*, *Qurān Mujīd*, Libya (1977).
3. "ṣawwara" implies giving definite form or colour so as to make a thing exactly suited to a given end or object: hence the title *Muṣawwir*, the Bestower of Forms or Colours, for this shows the completion of the visible stage of Creation." p. 1529, para 5406, *Qurān Mujīd* (1977).
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