In lieu of an introduction

The author of these lines does not feel sufficiently competent to write an introduction to the material presented here. An introduction, moreover, is not necessary in view of the small number of our models compared to the numerous extant architectural monuments of the Arab-Islamic world. Our selection concentrates on a few functional public buildings which were exemplary for their times. These were always endowed by prominent personalities, mostly the rulers themselves; therefore they represent not only the advanced architecture and engineering in each case, but also demonstrate the enormous cultural importance which was attached, not only to mosques, but primarily to hospitals and academies of higher learning.
ACADEMIES

The Mustanṣirīya University in Bağdād

Our model:
Wood and plastic.
Scale ca. 1:50.
Measurement of the base plate:
100 × 60 cm.
Steel frame and transparent hood.
(Inventory No. F 05)

This great university was founded in 625/1227 on the banks of the Tigris in Baghdad by the penultimate Abbasid Caliph al-Mustanṣir billāh. It is probably the oldest Arab-Islamic university where, besides the syllabus of the four orthodox law schools, medicine and mathematical sciences were also taught.¹ The maintenance of the University was secured by an endowment founded by the Caliph. The number of lecturers and other staff was ca. 400. The University had a large and important library which was plundered after the conquest of Baghdad by the Mongols. The Caliph often visited the University and «heard the lectures and the disputations of the scholars from a special place. Every now and then he held official receptions for state guests there.»

¹ For the references to the sources, see Nāğī Ma'rūf, Tārīh 'ulamā' al-Mustanṣirīya, 3rd ed. Cairo, n.d., vol. 1, pp. 25, 48.
Fig. 1: Plan of the second storey of the Madrasa al-Mustansiriya, after the building survey by the Department of Antiquities of Iraq.

Fig. 2: Ground plan of the first storey of the Madrasa al-Mustansiriya, after the building survey by the Department of Antiquities of Iraq.

General view of our model, seen from the East.

«The building survived the destruction of the capital and the downfall of the Abbasid dynasty at the conquest by the Mongols in 1258, ...» A decade later the University started functioning once again. It seems to have been much neglected in recent centuries. After its restoration between 1945 and 1962 the building is now part of the Museum of Islamic Culture and Art.² Our model was built on the basis of the commendable work by Hansjörg Schmid.

The Nūraddin hospital in Damascus

This hospital, known by the name of al-Bimaristān an-Nūrī, was founded in 549/1154, immediately after the liberation of the city, by Amīr Nūraddin Maḥmūd b. Zangi, who was of Turkish descent and the predecessor of the Ayyubid Ṣalāḥaddīn (Ṣalādīn). It was one the most famous hospitals in the Islamic world and functioned up to the 13th/19th century. Besides the Great Mosque and the Citadel, it is counted among the most important monuments of the Islamic period in Damascus. On the manner of functioning and the organization of the hospital, the Andalusian scholar Ibn Ḫubbār (d. 614/1217) wrote the following account in his travelogue on the occasion of his visit to Damascus in 580/1184: «In this place (Damascus) there are about twenty schools and two hospitals, an old one and a new one. The new one is more frequented and is larger. Its [69] daily upkeep costs about fifteen dinars. There are employees who look after the registration of the names of the patients and the necessary


Our model:
Wood and plastic.
Scale ca. 1:50.
Measurement of the base plate: 100 × 70 cm.
Steel frame and transparent hood.
(Inventory No. F 07)
expenditure on medicines, food etc. The doctors come every day early in the morning, examine the patients and prescribe the medical care with the requisite medicines and food, taking into consideration the condition of each patient … There is also treatment for mental patients …»

«In the ground plan of this oldest hospital preserved until now, four iwāns (vaulted halls) are grouped symmetrically around an inner courtyard and together they form a cross. There is a water basin at the centre of the inner courtyard.» «Through the muqarnas portal situated in a flat niche you enter into a square anteroom with a muqarnas vault. From this room the visitor goes into the western iwān. The eastern iwān facing it was, according to an inscription, the examination or consulting room. The four vaulted rooms in the corners, with no windows to the outside, were wards.»3

The hospital of Princess Türän

The oldest completely preserved hospital of Anatolia was erected by Ahmad Šâh of the local dynasty of Mengüček in 625/1228 on the instructions of Princess Türän, a daughter of Faḥraddīn Bahram Šâh and wife of Ahmad Šâh. It is situated in Divriği (south-east of Sivas) next to the mosque erected by Ahmad Šâh. The hospital part covers an area of 32 × 24 metres; the area of the total complex, together with the mosque, amounts to 32 × 64 metres.¹

¹ Arslan Terzioğlu, Mittelalterliche islamische Krankenhäuser, pp. 121–125.
The Qalāwūn hospital in Cairo

The most famous and most important hospitals in the Arab-Islamic world undoubtedly include the al-Māristān al-kabīr al-Manṣūri in Cairo, which is known in modern publications as Qalāwūn Hospital. Its founder was the Mamluk Sultan al-Malik al-Manṣūr Saifaddīn Qalāwūn (ruled 678/1279-689/1290). He was inspired to build the hospital by his visit to the Bimarstān an-Nūri in Damascus in 675/1276. Five years after his accession to power in Cairo, i.e. in 683/1284, he ordered the work to begin. A madrasa was attached to the hospital by his visit to the Bimarstān an-Nūri in Damascus in 675/1276. Five years after his accession to power in Cairo, i.e. in 683/1284, he ordered the work to begin.¹ A madrasa was attached to the


«The reasons for the construction were the following: when al-Malik al-Manṣūr was still an amīr and was fighting against the Franks during the reign of Malik az-Zahir Baibars in 675/1276, he had a violent attack of colic in Damascus and the physicians healed him with medicines brought from the hospital of … Nūraddīn. After his recovery, he rode up to the hospital, admired it and vowed that he would build a hospital if God granted him the throne. Later when he became Sultan he set out to fulfill the vow, and his choice fell on the Qutbiya building. He gave the 'emerald castle' to the owners in exchange and entrusted Amir ‘Alamaddin Sanā’ī as-Suqūi with the responsibility for the construction. He left the central court as it was and equipped it as a hospital; it consisted of four wards, in each ward there was a fountain, and in the middle of the courtyard there was a container into which the water of the fountains flowed … When the building was completed
al-Malik al-Manṣūr endowed for it so much landed property in Egypt and other countries that every year an income of nearly one million dirhams was received, and he determined the places where the money for the hospital, the house of prayer, the academy and the school for orphans should be paid. After this he ordered a cup of wine to be brought from the hospital, drank from it and proclaimed: This I have endowed for my equals and for those lesser than I am, I have designated it as an endowment for the king and for the servant, for the soldier and for the amir, for the big and for the small, for the free man and for the slave, for men and women. He determined for it all the medicines, the physicians and all the rest which anyone could be in need of during any illness. The Sultan employed male and female bed-makers for the service of the patients and he determined their salaries; he erected the beds for patients and provided them with all kinds of blankets which were necessary in any disease. Each class of patients was given a special room. He assigned the four wards of the hospital for those suffering from fever and similar illnesses, one ward for those suffering from eye diseases, one for the wounded, one for those who suffered from diarrhoea and one for women; he divided a room for those who are on their way to recovery into two parts, one for men and the other one for women. Water is piped to all these areas. One special room was for cooking the food, medicines
hospital [73], which Wüstenfeld correctly understands as an academy. It is not certain whether medical lectures were held there or in special rooms of the hospital. Probably the staff included the physician and versatile scholar ʿAlī b. Abī l-Ḥāzm Ibn an-Nafis (d. 687/1288), the discoverer of pulmonary circulation, who donated his house and his library to the hospital. The hospital was still in good condition in the 17th century and seems to have fallen into disrepair only in the 18th century. Today the supporting walls are still standing for the most part. At the beginning of the 20th century a new hospital with the same name was built as an extension of the old building. The Egyptian government also plans to restore the old building once again.

Pascal Coste, a French engineer who was commissioned to build factories by the Egyptian government in 1818-1825, left behind some valuable drawings of the views and a sketch of the ground plan of the hospital. The three endowment documents of the hospital from the years 684/1285, 685/1286 and 686/1287 were rediscovered in 1913 in Cairo and are now with the Ministry of Endowments there. The excerpts translated into French by the historian of medicine Ahmad Issa Bey testify to the high standard of the hospital organization in the Arab-Islamic world in the 7th/13th century.
The hospital
of sultan Bāyezid II in Edirne

The hospital was founded in 889/1484 together with an academy (madrasa), a mosque and a canteen for the poor (‘imārat) on the banks of the river Tunca in Edirne. «Behind the mosque on the banks of the Tunca Sultan Bayezid II arranged for a harbour to be built so that he could go by ship from this building complex to his castle in Edirne.»¹ According to Terzioğlu the hospital consists of three parts: The «hospital proper (Dār aš-ṣifā’) with a large central dome and 12 small ones». Next to it, a «part of the building, grouped around a small inner courtyard, which primarily serves administrative purposes». And «adjoining the madrasa, a part of the building with a large inner courtyard, kitchen and laundry.»

«The hospital proper is a large hexagonal building, about 30 metres in diameter, with six rooms as closed rooms for patients and with five recesses in the form of iwâns. The rooms for the patients and the recesses surround a middle hall, which is vaulted over by a dome. This made it possible to look after several patients with limited nursing staff … Here the architect Hayreddin primarily created a functional building. While the adjoining academy exhibits once again the old madrasa type, the peculiar form of the hospital testifies to the fact that the architect broke new ground, while taking the functional aspect into account.

¹ For the literature on the document, see A. Terzioğlu, Mittelalterliche islamische Krankenhäuser, op. cit., p. 190.

² For the literature on the document, see A. Terzioğlu, op. cit., pp. 190-191.
into German in 1912 by Georg Jacob. From this we will cite here, with some slight modifications, his observations on the music therapy of mental patients: «I have seen a remarkable thing: His late majesty, Bajezid II ... has employed 10 musicians for the cure of patients in the endowment document, for the recovery of those suffering from pain, for strengthening the mind of the insane and for repelling the gall; 3 of them are singers; of the remaining, one player each of the reed flute (nâûzen), the fiddle (kemâni), the panpipes (mûsîqâri), the dulcimer (şantûri), the harp (çeŋî), the harp psalterion (? çeŋî-şantûri) and of the lute (‘ûdî). They come three times a week and play for the patients and the insane. By the grace of the Almighty many of them feel relief. In fact, according to the science of music, the makams nevâ, râst, dügâh, segâh, çârgâh and sùzinâk are intended for these [patients and insane]. But when the makams zengûle and bûsêlik [are played] and concluded with the makam râst, then it is as if they have brought new life. In all instruments and modes there is food for the soul.»

The hospital was functioning until shortly before the beginning of the First World War, with a brief interruption between 1876 and 1894 because of the Russo-Turkish war. At the beginning of the second half of the 20th century it underwent a radical renovation.

Our model conveys the simple lines of the external form of a mosque complex in which many historians of architecture see the beginning of the period of the grand mosques of Istanbul. As to the question of its emergence, scholars distinguish between two important stages of development of Ottoman architecture: the beginnings from ca. 700/1300 in Anatolia and in Edirne up to the conquest of Byzantium in 857/1453, and the subsequent ingenious and monumental style, which was inspired by the direct acquaintance with Hagia Sophia and other ancient monuments of the new capital. The Şehzade Mosque is the first of the three grand mosques built by Mi’mâr Sinân (b. 895/1490, d. 996/1588), the greatest architect of the Ottomans. The mosque complex was erected by Qânûnî Süleyman (‘the Magnificent’) in memory of his first son Prince Mehmed, who died in 950/1543. The year when the construction began is in dispute; but the building was completed in 955/1548. A higher officer, Sinân by name, who had made a name for himself as a pioneering engineer [78] and had already built some smaller mosques, was entrusted with the planning and the execution. He himself remarked later

Plan of the parts of the Şehzade Complex which go back to Sinan (after Kuban)

1: Mosque
2: Mausoleum (türbe) of Şehzade (Crown Prince) Mehmed
3: Mausoleum (türbe) of (Chancellor) Rüstem Paşa
4: Primary school (mekteb)
5: Canteen for the poor (imaret)
6: Caravanserai
7: Academy (medrese)
that this «first imperial mosque on a truly monumental scale» was his «apprentice work». Sinan, who from the very first envisaged a centralized ground plan, adopted the expedient of extending the space under the dome not by two but by four separate half domes. This was the most obvious and logical way of combining the centralization with the enlargement of space; but this also contained the danger of producing too much uniformity and symmetry, which could easily become tiresome. Furthermore, the four great pillars that support the dome look stranded and isolated in the middle of the vast space; thus their inevitably large size becomes accentuated in an almost excessive manner. Sinan appears to have realized these aesthetic shortcomings after the construction was over, for he never repeated them again. On the other hand, the whole complex gives the impression as if a systematic attempt was made here to explore the entire range of possibilities of laying the ground plan. This leads to the assumption that perhaps the idea here was to create something like a prototype model of a mosque from which in gradual stages a wide variety of more lively ground plans could be derived.»


\[2\] ibid., p. 238.

\[3\] Cornelius Gurlitt, *Die Baukunst Konstantinopels*, text volume, Berlin 1907, p. 68.

\[4\] D. Kuban, *Sinan’ın sanatı*, op. cit., p. 69.

The mosque has a total of 183 windows, «which let in uniform brightness to the homogeneous space in all parts. The windows still have their old glass panes with delicate lattice windows and some parts of colour painting.» The length of the main dome measures 19 metres, its vertex is 37 metres high. Besides the mosque, the whole complex includes an academy (medrese), a children’s school, a canteen for the poor and a caravanserai. They are located outside the walls of the courtyard. In the courtyard of the mosque there is the mausoleum of Prince Mehmed.

Figs.: epitaphs of the mausoleum (türbe) of Şehzade Mehemmed and that of Rüstem Paşa in the Şehzade complex.
Interior of the Şehzade Mosque with a view into the main dome, from Yerasimos, *Istanbul*.\(^6\)

*Türbe* (mausoleum) of Şehzade Mehmed (A. S. Ülgen).

The Süleymāniye
in Istanbul

The Süleymaniye Camii (this is how the name of the mosque is written in modern Turkish) is, chronologically, the second grand mosque built by the architect Sinān. Together with its social and cultural institutions, it is perhaps the largest architectural complex created in the Ottoman Empire. The construction began in 957/1550 and was completed in 964/1557.1 It is reported that Sultan Süleyman himself suggested the location for the construction and that he entrusted his architect Sinān with the ceremonial opening of the building at the time when the keys were handed over.2

Sinān raised the number of minarets to four. The two higher ones (76 metres each) facing the courtyard of the mosque have three balconies each (şerefe), the two smaller ones (56 metres each) towards the outer side of the courtyard have two balconies each.

Cornelius Gurlitt3 finds the design of this mosque an improvement over that of the Bâyezîd Mosque in Istanbul: «The main dome and two half domes as cover of the central area.

---

1 D. Kaban, Sinan‘in sanatı, op. cit., p. 78.
2 ibid., p. 78.
3 Die Baukunst Konstantinopels, op. cit., p. 69.
The latter are supported by two diagonally placed half domes each so that a space of 52.4 metres is vaulted. The pillars, which have a strength of 7.44 to 7.56 metres in their broadest parts, however, do not give the impression of heaviness as a result of the structuring of the outline and the insertion of niches; in a very ingenious manner they are formed in such a way that each of the side aisles could be covered with five domes of different diameters. The arrangement shows the most complete mastery of composition so that the vaults could be formed organically everywhere. Of course, contemporary masters of the Renaissance, such as San Gallo, would have objected to the fact that the axes of the arches on which the domes rest do not coincide with those of the domes. Look at the arrangement of the middle domes of the side aisles: the difficulty is overcome clearly and plausibly by inserting an arch across those resting [sic] on the pillars of the external side, and through the extremely flexible shape of the stalactite spandrels.»

The domed areas at the four corners serve as entrance halls of the mosque. You enter the mosque through a door and before that through an arcade of the most delicate formation. The arcade in front of the Sultan’s podium, particularly is decorated...
with great care. Between the corner rooms built-in balconies extend inside and outside; on the outside in two storeys, inside in one. The architecture of the pillars and arches belongs to the most noble and perfect of all that has been accomplished by Turkish architecture. The juxtaposition of the finely structured arcades with the massive structure of the main building which soars over them is likewise of the highest artistic subtlety.»

All in all 138 windows provide light to the hall.«Behind the mosque, adjoining its kiblah side there is a garden enclosed by a wall with barred windows. Here is situated Süleyman’s mausoleum, completed in [974/1566], which is one of the most magnificent edifices of this type. Besides Süleyman himself, Sultana Süleymân (Hürrem Sultan, d. [965/1558] and Ahmed II (d.[1106/1695) … are buried there.»


ibid., p. 71.
Interior with view towards the mihrab (from St. Yerasimos, Istanbul, op. cit. p. 263).
The Selîmîye Mosque

The mosque in Edirne, written Selimiye Camii in modern Turkish, is the third grand mosque built by Mi’mâr Sinân. It was built on the orders of the Ottoman Sultan Selim II. The construction lasted from 976/1568 to the end of 982/(March 1575).¹ The seriously ill Sultan had passed away three months previously. The Selimiye Mosque is generally thought to be the culmination of Sinân’s life-work and of his experience and mastery of the architecture acquired during nearly half a century of intensive work. [85] He is said to have expressed himself in this spirit when he remarked that he had built the Şehzade Mosque during his apprentice-

¹ D. Kuban, Sinan’ın sanatı, op. cit., p. 133.
ship, the Süleymaniye Mosque during his period as a master architect, but he had reached the climax of his ability as an architect with the construction of the Selimiye Mosque.\textsuperscript{2}

\textquotedblleft The mosque contains the main features common to all the larger complexes: the forecourt (haram) and the congregation hall or the prayer hall (camii). Both lie on the same level, approximately 1 metre above ground, and together form a closed rectangle of 60 metres width and 95 metres length, from the sides of which only the substructures of the minarets and an apse on the southern side protrude slightly. Almost half of this area is taken up by the forecourt. It is of rectangular shape and lies at right angles to the main axis of the building. The vaulted halls of roughly 8 metres or 9 metres width, to be found on all the four sides, surround an open courtyard of 37.40 to 24.80 metres.\textsuperscript{[86]}

\textquotedblleft The basic form of the prayer hall also appears in its outer perimeter as a rectangle lying at right angles to the main axis, but it takes the shape of a regular octagon in the middle. This octagon

\textsuperscript{2} D. Kuban, \textit{Sinan'ın sanati}, op. cit., p. 127.
constitutes the basic form for the development of the centre of the hall proper. The remaining parts of the ground plan on both the sides of the octagon are used to extend the space for the hall, the side halls and balconies. The internal measurements of the main hall, when measured on the level ground in the rectangle, amount to about 45 to 35.90 metres. The width of the octagon is roughly 31.40 metres, the distance between the pillars being 10.50 metres.»

«Three mighty main arches, separated by two smaller intermediate arches, are borne here by stately and polished granite pillars and reach, in rhythmic alternation, almost twice the height of the side halls. Crowned with three domes over the main arches, the middle one of which is raised to an even greater height and is structured particularly richly with ribbing, this part of the forecourt is an independent entrance hall of finely shaped proportions and monumental treatment and thus prepares the entry to the place of worship in a unique manner.»

«A magnificent portal with niches, adorned with the richest forms of Ottoman art, decorated with stalactite formations and rich ornamentation, leads us now through the entrance hall into the main hall of the mosque, the hall of prayer or congregation. After passing through a semi-dark vestibule, formed by hanging carpets, we find ourselves immediately below the wide vault of the main dome. We find that our boldest expectations, already enhanced by the entrance hall that led us in, are far surpassed by this dome, which is vaulted above us. Eight massive pillars, which are almost cylindrical in outline, but structured in multiple ways, soar up, and from there two rows of mighty pointed arches rise in tiers one above the other, all of them serving the common purpose of bearing the vaulted dome, and producing an impressive effect due to the uniformity of their purpose.»

The inner length of the diameter of the main dome, i.e. the distance of the walls and the pillars supporting the dome, is 31.50 metres.


\(^3\) ibid., p. 341.

\(^5\) ibid., p. 341.

\(^6\) ibid., p. 342; D. Kuban, *Sinan’in sanatı*, op. cit., p. 137. The corresponding length of the Ayasofya (Hagia Sophia) is 31.40 metres.
Interior of the Selimiye Mosque, view to the west, with minbar (from St. Yerasimos, Istanbul, op. cit. p. 271).
The Sultan Ahmed Mosque

The Sultan Ahmed Çami’i is also known as the Blue Mosque because of the light blue colour of the interior. It was built at the orders of the Ottoman Sultan Ahmed I (ruled 1012/1603-1026/1617). The architect was Mehmed Âğâ. The construction was commenced in 1609 when the ruler who ordered the construction of the mosque was but 19 years old. It was completed in 1616, and the Sultan lived only a year longer. It is reported that he took part in the foundation laying ceremony with a golden hoe.¹


Our model: Wood and plastic. Scale 1:100. Measurement of the base plate: 130 × 100 cm. Steel frame. (Inventory No. F 03)

«Many consider this building to be the most beautiful of all imperial mosques; it may be so. Certainly the terraced arrangement of domes and half domes provides a magnificent view with the soft silvery grey of the stone and of the leaden roofs, with the gold of the ornaments added on the minarets and domes. This rich impression of the exterior is intensified even more by the number of minarets: there are six of them, that is, two more than those dis-

View into the main dome (Photo: K.O. Franke)

played by the other imperial mosques in Istanbul. Therefore this structure appears imposing without being [89] heavy. The charm which the observer vaguely feels retains more of the atmosphere in view of the massive size of these forms which are just a little bit softer and smoother than those of Sinan’s grand mosques.»

«The Blue Mosque is an almost square hall (51 metres long, 53 metres wide), vaulted over by a dome of 23.5 metres diameter and 43 metres height at the vertex. It is supported by four wide pointed arches which transmit the curvature of the dome over four spandrels to the square ground plan of the main hall, which is marked by the massive supporting pillars at its corners.»

«Light streams into the interior through 260 windows which were once filled with coloured glass like the wall of the mihrab. There are plans for filling more windows once again with coloured inlaid glass so that at least some of the old impression is recreated of a hall that is not dim but lit in a subdued way.»

«The endowments belonging to the entire complex of the mosque (külliye) were appropriate to the size and cover a medrese (…), the Sultan’s mausoleum, hospital and caravanserai, primary school, canteen for the poor and a bazaar. The hospital and the caravanserai were demolished in the 19th century, the canteen for the poor was incorporated into the building of the School of Industrial Arts on the southern side of the At Meydani. The primary school was renovated recently; it is the building on the northern side of the outer enclosure wall of the mosque. The medrese, which is in fact rather big but appears small in relation to the mosque, lies outside the enclosure wall of the complex towards the north-east, very close to the exceptionally large mausoleum with the square ground plan. In this mausoleum … lies Ahmed I next to his consort Kösem Sultan and three sons: Murad IV, Osmân II and Prince Bayezid.»

3 ibid., p. 151.
4 ibid., p. 152.