MEDIEVAL HOSPITAL PHARMACY NETWORK OF CITIES OF MUSLIM EAST

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MEDIEVAL HOSPITAL PHARMACY NETWORK OF CITIES OF MUSLIM EAST

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The work reveals a network of hospital an pharmacies (hospitals, Wellness complexes: DorUshifo, Bemaristan, Maristan and Dorikhana-pharmacies) of the cities of the Great Silk Road. The history of formation and stages of development of medical institutions of the countries of the Muslim East in the medieval period are considered. The principles and methods of placement of medical and pharmacy medical institutions in the structure of the cities of the Near and Middle East are studied, the architectural and urban typology of these institutions is revealed. In the objects of research, the leading place is given to samples of the countries of medieval Central Asia.

Keywords: The Great Silk Road, hospital-pharmacy network, the history of the formation and stages of development of medical institutions of the medieval countries of the Islamic East (Near and Middle East), Central Asia, town-planning accommodation, architectural and town planning typology, hospital and pharmacy institutions.

Medieval hospital and pharmacy network and medical institutions of the cities of the Muslim East belong to one of the most undeveloped categories of history of architecture. A very fragmentary characteristic of hospital buildings and treating centers can be found in the works of V.L.Voronina, L.Yu.Mankovskaya, J.Gelabo, Ar-Rihavi, D.Getter, G.Ernst, S.Hamarneh, V.Unsal. It should be said that not only the architecture, but also the history of the formation, town-planning distribution in the structure of cities, the analysis of space-planning and artistic features of hospitals, remained until now outside the field of attention of researchers.

It is known from historical and historical-medical literatures that in the period of the Medieval Ages in many cities of the Near and Middle East and Central Asia, in connection with the established feudal relations and the unprecedented flourishing of medical science, the construction of civilian hospitals - "bemaristan"/5, 7.9/. The first such hospital in the countries of the Muslim East was founded in Damascus by the Umayyad caliph al-WalidibnAbdulmalik in 706/10, p.41/. The hospital was intended for the treatment of lepers and therefore it was located outside the city. A year later, in Cairo, by the orders of the same caliph, a civilian hospital was built, which was already located inside the city. When in the caliphate the power passed into the hands of the Abbasids and the capital was transferred from Kufa to Baghdad, then in the 8th century in Baghdad, first Caliph al-Mansur, then Caliph al-Rashid built "bemaristans." Soon, this humanistic principle of beneficence and the placement of public hospitals within the city became an example for other caliphs and Islamic rulers. Thus, the construction of public hospitals began in the 8th century in other cities of the Muslim East: Baghdad, Rea, Basra, Urgench, Samarkand, Ghazna, Hamadan, Jerusalem, Antioch and others.
It should be noted that the majority of these hospitals had independent buildings and being located in the structure of the city, along with other civilian buildings, performed a very important medical function for residents of medieval cities.

One of the major centers of hospital construction in the East in the Middle Ages was Baghdad. In the 9th and 10th centuries, six hospitals were established in various places of this city (Fig. 1, a), which were managed by such renowned Eastern physicians as Ar-Razi and Sinan Ibn Sabat /12, p.297/. Two hospitals in Baghdad were built on the advice of Al-Razi on the picturesque banks of the Tigris River, where there were well-landscaped areas with a favorable climate for the treatment and recreation of patients.

The Caliph al-Muktaqir hospital was located at the “Syrian Gate” of Baghdad, and the hospital built by his mother, al-Sayyid, was on the eastern side of the city, near St. John’s market on the banks of the Tigris /12, p.297/.

Medieval civilian hospitals were often called by the names of their founders, who donated the necessary funds for the construction and maintenance of hospitals for charitable purposes.

One such person, the ruler of Baghdad was Adud ad-Dawla. Known in the history of the public hospitals called "Bemaristan al-Adudi" was founded by him in 981. Sources report that the hospital was located in the central part of Baghdad on a small beautiful hill located on the western bank of the Tigris and, in its magnificence, resembled the palace of the ruler /22, p. 261/. The hospital was known not only for the beauty of its construction, it also had a high level of medical care. The founder Adud ad-Dawla himself was interested in this, who selected personnel according to their level of knowledge on a "competitive" basis. Inviting 100 tabibs-physicians from various countries, after the contest 50 of them were left, out of these 50, he chose the strongest 10, out of 10 left three and already from these three he chose one of the most qualified and talented as the head physician of the hospital /13, p.214/. In his hospital besides the main one, 24 talented doctors worked, among which besides therapists, bone therapists and pharmacists there were also surgeons and oculists /22, p.263/. In addition to the city hospitals mentioned above, a mental hospital was conducted in Baghdad, which was located far from the city.

One of these hospitals, designed exclusively for the poor, was “Bemaristan Ahmad ibn Tulun” in Cairo, built in 872 next to the mosque of the named Sultan. The hospital had a section for the mentally ill, as well as baths with departments for men and women /22, p. 262/. It should be noted that one of the characteristic features of civilian hospitals in the countries of the medieval East was that from the very beginning they were organized at the expense of secular blessings and functioned independently of religious societies, whereas in medieval Europe and Byzantium, medical institutions were subordinate to the clergy and organized mainly with large monasteries and temples /16, p.37; 10, p. 78, 161/.

In the 11th and 13th centuries in the Middle East, not only capital, but also provincial cities had their own hospitals. So, in the 11th century in the Syrian city of Beit-al Mukkaddas, located on the picturesque top of the mountain and having about 20 thousand people, there was an excellent hospital. A lot of money was donated for its maintenance, the necessary drugs and medicines were given to the sick, doctors and medical personnel were admitted to the hospital, receiving payment from donated sums / 1, p.65-67/.

Along with self-built hospital buildings in the medieval East, there were hospitals erected in connection with religious and other public buildings (Fig. 1.).

In the 12th century, a hospital operated in Maghreb (Maracco), which was located in the greenery of a park planted with various trees, flower gardens and lawns / 23, p.376/. In some areas of the park vegetables were also grown. Water supply was through water channels. In the courtyard of this hospital there were four beautiful pools, one of which was made of white marble. The pools around which the patients rested were provided with clean running water.

In hospitals in Eastern countries not only treated the sick, but also prepared tabibs-doctors. For that, hospitals were not rarely built near the buildings of the madrasah or in complexes with them, which made it possible to organize medical schools or treatment centers with a “clinic” and madrasahs where famous physicians and scientists of their time worked. So, in 1154 in Damascus, Sultan Nur ad-Din established a complex, which consisted of Bemaristan, a madrasah and a hostels /23, p.372/ (Fig. 2, b). According to historians, the treatment in those hospitals was put on a high professional level.

About a century later, an architectural triad, similar to the complex of Sultan Nur ad-Din in Damascus, was erected in Cairo in 1284 by Sultan al-Mansur Kala’un / 25, p. 61/. Here bemaristan, madrasas and mausoleum formed a single architectural ensemble. Bemaristan and madrasahs included in the ensemble, according to historians, were once considered the pride of Eastern architecture and functioned as a center with numerous medical departments and an excellent
medical school / 22, p.267 /

A, B. Accommodation hospitals in the plans of Baghdad city 9th and 10th centuries.
E. Location of the hospital in the ensemble of the madrasah at the Fatih Mosque in Istanbul, Turkey, 16th century: 1-hospital; 2-Fatih Mosque; 3-madrasas; 4-school; 5-imaret and Caravanserai.
F. Hospital in the complex of the Bayazid II mosque in Edirne, Turkey, 16th century: 1-entrance; 2-mosque; 3-4 hospital; 5-madrasahs; 6-house building; 7-imaret.

C. Plan of central part of Damascus city; 1-citadel; 2-grand mosque; 3-bemaristanNur ad-Din. 12th century.
D. View of complex Bayazid II from the hospital Edirne.

Figure 1. Town planning placement of medical institutions of the Middle Ages
Figure 2. Placement of medical institutions in the structure of cities

Designed for 800 seats, the bemarastan Kala’un included sections for febrile patients, ophthalmic and dysenteric patients, a surgery section, a pharmacy, a dispensary, and a library /16, p.97/. In Baghdad in 1224-1232, the Caliph Mustansir built a special medical school building - a huge two-storeyed madrasah, which included not only a training center with a magnificent library, but also a hospital with a clinic and baths /25, p.36/. The school building was located in shahristan on the picturesque left bank of the Tigris River.

Sources indicate that hospitals like these in the countries of the East were often built in large cities of Central Asia /6, p.309/. They were not only medical institutions, but also a kind of shelter for the poor. Indeed, before the Mongol invasion of Central Asia, in many large cities, such as Samarkand, Bukhara, Urgench, Merv, Ghazna, there were civilian hospitals. But due to the attack of the horde of Genghis Khan in Central Asia, they, unfortunately, were destroyed and fell into disrepair.

A striking example of the high level of development of medical practice in medieval Central Asia was the era of the Samanids (819-999). “During this period,” writes the famous medical historian Yu.B.Iskhaki, “there were numerous hospitals and pharmacies in the busiest cities of the Samanid empire, in which experienced doctors and pharmacists worked” /7, p.16/. He also notes that "at that time an official was appointed in every major city and administrative center, whose duties included supervision of hospitals and pharmacies” /7, p.12/.

According to well-known modern data, the Bukhara, Urgench, Merv and Samarkand hospitals are among the earliest civilian hospitals that existed in the territory of medieval Central Asia. We have no information on the early medieval Bukhara hospital. The Urgench Hospital, created in all likelihood, operated at the “Mamun Academy” at the time when Abu Ali IbnSina worked there (the beginning of the 11th century). According to the testimony of the Arab historian and traveler IbnBatuta, who visited Urgench in the first half of the 14th century, a civilian hospital operated there, along with doctors from Syria /18, p.64/.

Apparently, several hospitals were built in different years in ancient Urgench. The 14th century hospital was built along with other buildings within the city and, according to IbnBatuta, was one of the landmarks of Urgench /18, p.65/. We know about the Merv hospital that, as the head physician in the 10th century, experienced tabib Muhammad Azimkhan worked there and that there was a special section for the mentally ill at the hospital /10, p.146/.

Let’s speak about Samarkand hospital in more detail. According to the documents of Ibrahim TimgachBaghrakhan, who ruled Samarkand in 1046-1068, this hospital was established in 1066 and was located on Rivdad Street inside shahristan /5, p. 171/ (Fig. 2, a).

According to O.G.Bolshakov, the hospital was
located in the area of the current Suzangaran street. The construction of hospitals, as well as other charitable buildings, acquires an intensive character during the rule of Temur and the Temurids’s empire.

In the 14th century, in Samarkand, as part of the Amir Temur citadel buildings, the Dor Ush-Shifo hospital had been functioned, where experienced doctors, besides treatment, were also engaged in teaching medical science.

Alisher Navai, the founder of Uzbek poetry, built several hundred charitable buildings and structures in the Khorasan regions, including hospitals, poorhouses and bathhouses. One of these hospitals, "Shifo"a ("House of Healing"), was built in the suburb of Herat on the bank of the River Injil. At this picturesque place, on the initiative of Navai, a complex consisting of several ensembles was created. The ensemble included "Shifoyia" and the medical school-madrasah "Ikhlosia", which lay on the same axis as the main entrances opposite each other. This arrangement of buildings was called “kosh”.

The area between the hospital and the madrasah was framed by flower beds, ornamental trees and shady avenues that received moisture from small streams. Next to the hospital and the madrasah, along with them, were the Hammam "Safoya" and the khankh "Halosiya". Thus, on the picturesque bank of the River Injil, a uniquely beautiful city-planning ensemble arose, in which, for all the diversity of architectural forms, harmony was achieved in the spatial organization of the functions of a therapeutic and educational nature.

Orientalist scientist M.E. Masson pointed out that several hospitals operated in Herat in the 15th century, including two built by persons involved in the reigning house: the widow of Temur’s son Umar Sheikh-Milkataga, who later became Shahrukh’s wife, and Shahrukh’s grandson Mirza Allahdavla /11, p.132/. Khondamir mentioned that these hospitals were again put in good condition because of Alisher Navai’s efforts.

Khondamir, in his book "Maosirul-mulk" ("The History of Kings"), reported that in addition to the above-mentioned medical institutions in Herat, the Sultan-Khussein Baikara built Dor-us-Shifo in Bagi Zagon park /20, p. 67/. So in Herat in the 15th and 16th centuries at least four hospital institutions functioned, among which the most famous was the Shifo hospital built by Navai. It should be noted that two of these hospitals ("Dor us-Shifo" by Hussein Boykara and "Shifoyi" by Navai) were placed in the territory of the country parks "Bagi Zagon" and "Injil".

During the reign of the Sheibanids (16th century) and the Asht Khanids (17th century) in Mavarranakhr, medical care and the practice of hospital construction did not stop. So, in the middle of the 16th century in the location Charbag Kaikaus, located near Tashkent, was erected "Shifo-khana" (clinic), in which patients from the upper class and wounded soldiers-aristocrats were treated /13, p.36/. According to sources, here, in addition to treatment, literary disputes and other cultural events for representatives of the nobility were held. In the 17th century the governor of Bukhara, the famous tabib scholar Emir Subkhankulihan (1625-1702), wrote the book "Tibbi Subhaniy" ("Subhanian Medicine") and established a hospital in the medical school - "Madrasahidor us-shifo" /10, p. 80-85/.

The hospital building, erected by him in 1682, was located on the Bukhara Registan north-west of the gate of the Bukhara Arch (see fig. 3). A hospital with a medical school was maintained by the state and funded from the waqf income.

According to some information, in the 16th century the governor of Bukhara Abdullah Khan II (1557-1598) also built a hospital /10, p.146/, but unfortunately we do not have the necessary information about it. Sources report that in the 16th century, a civilian hospital was built in Balkh by the notable figure of Khoja Kamolidin Kunak, who was then working for the Sheybanid sultan Kistan Kara /23, p.328/. At this hospital there was a school (madrasah) and a bath similar to the Herat hospital.

Many hospitals and medical institutions were built in the 12th and 16th centuries in the cities of Turkey: Istanbul, Bursa, Amasya, Edirne, Divrigi, Antioch and others (see fig. 2). In contrast to the hospitals of other cities of the East, many of these hospitals constituted a complex together with large mosques, imarets (welfare canteens), khankanah and caravanserais /15, p. 162/. Thus, the large mosques of Istanbul city (the mosque of Sultan Mehmed-Fath and Sultan Suleyman) had their hospitals with them. At the mosque of Sultan Mehmed-Fath, in addition to the hospital, there were medical school, a madrasah, a accommodation, a charity canteen and a bazaar (see Fig. 1). The hospital, like many other magnificent buildings of Istanbul, was designed by the famous Turkish architect Khoja Sinan /15, p.175/.

The organization in the Turkish cities of medical affairs with large mosques in the initial period of the emergence of Islam corresponded to the social and functional characteristics of religious objects, since this achieved attracting a large number of believers to the mosque and meeting their needs for social, religious and medical
functions. The combination of a mosque with a hospital was occasionally practiced in other eastern cities. For example, the bemaristan and the mosque of Ahmad ibnTulun (9th century), the bemaristan with the mosque and madrasah of Sultan Kala’un (13th century) in Cairo. Such unity of functions in the urban development plan at the beginning of the spread of Islam contributed to the holistic service of the population, especially in religious and religious institutions, which were at that time hospital buildings and almshouses. However, with the approval of Islam, in the East, the construction of hospitals with mosques or in combination with them has ceased to be an obligatory norm. Therefore, this technique in subsequent centuries did not spread in Central Asia and the Middle East. This tradition was preserved only in Turkey.

According to historical data, the first state-regulated independent pharmacy in Islamic states was opened in 754 by Caliph Khorurar-Rashid in Baghdad / 8, p.71 /. Then similar pharmacies began to appear in other countries of the Muslim world. Thus, in Egypt, during the time of the ruler Ahmad ibnTulun (9th century), an independently functioning pharmacy was established at his palace mosque and hospital, where doctors were asked every Friday to treat patients who came here for prayer free of charge / 12, p.143 / . In the 11th century, independent pharmacies were opened in the Spanish cities of Cordoba and Toledo.

The structure of medieval hospitals, in some situations, was similar to the structure of a modern clinical hospital. In addition to the wards, the indispensable components of the hospital were the “jamaatkhana” - the common hall for tabibs (such as residency rooms) and nurses, a pharmacy, a kitchen, a lobby with patients' reception, and other utility rooms, as well as a patio (sometimes there are several), in the middle which was located open water. In addition to the basic structure, the number of premises of some hospitals included a “small hospital” (such as an ambulatory clinic) for visiting patients, as well as a library of medical books.
Figure 3. Spatial planning solution Dorush-Shifo in Bukhara. 17th century: 1-entrance to the Dor-ush-Shifo; 2-patio; 3-sardoba; 4-jamaatkhana; 5-chambers; 6-darshkhana(study); 7-library; 8-reception room; 9-kitchen; 10-pharmacy; 11-doctor’s room; 12-doctors’ and muddarises’(mentors) room.

As an example of an independent pharmacy building erected in Central Asia, we can cite a pharmacy found in 1983 in the Bukhara Valley on the ruins of shakhristan Ancient Paikent, 50 km from Bukhara, dating back to the end of the 8th century / 8, p.72 / . The building of the pharmacy consisted of several rooms, compartments and basement. Later it played the role of a kind of "refrigerator" for the preservation of raw materials (medicinal herbs, chemicals and other rapidly perishable raw materials) from which medicines were made. Many different glass and ceramic dishes were found in those rooms, a lot of coins and a small bronze quadrangular cup with the remains of beeswax (in Eastern medicine, beeswax was used as a medicine). In 1983, in the same ancient pharmacy in the city of Khujand, vessels with mercury residues were found, which served mainly inpatients and prepared medicines according to the recipes of tabibs-doctors who worked in the hospitals. Pharmacies were also available at hospitals in Samarkand, Merv, Herat, Ree, Tabriz, Khamadan, Shiraz, and other cities.

So, the available data allowed us to develop a town-planning typology and a system of placing pharmacies in the medieval cities of the Muslim East / 19 / (Table 1).

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<th>Urban typology and placement system</th>
<th>Characteristics of the pharmacy</th>
<th>Examples from medieval practice</th>
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<td></td>
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<td>Pharmacies as part of large hospitals and medical schools</td>
<td>There was a separate block from several rooms; Pharmacies at medical schools sometimes contained medicinal gardens.</td>
<td>Pharmacy and pharmacy garden at Gundish-Puru medical school, the 5th and 6th centuries.</td>
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<td>A pharmacy as part of the Ibrakhim Tamgach-khan hospital in Samarkand, the 11th century.</td>
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<td>In the form of medical shops &quot;dorozokho&quot; and squares - &quot;Murabba al-Attarin&quot;</td>
<td>Drug shops existed in the bazaars of Bukhara, Samarkand, Kherat, Khojent and others.</td>
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<td>Home Pharmacies</td>
<td>Room with a pharmacy shop</td>
<td>There were home pharmacies in Bukhara, Samarkand, Khujand, Baghdad and others.</td>
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<tr>
<td>Pharmacies at large inns (caravanserai) and rabats</td>
<td>In a separate room, which included outpatient services</td>
<td>A pharmacy consisting of Rabati Malik, near the town of Navoi, the 11th century.</td>
</tr>
</tbody>
</table>

Famous medical historian N.Yu. Nuraliev wrote that in the period of Ibn Sina, home pharmacies and bazaar shops selling drugs formed the “pharmacy chain” and the basis of the population’s drug supply / 14, p.127 /. It should also be added that in the Middle Ages, almost every hospital had its own well-stocked pharmacy, where experienced pharmacists worked. So, for example, the state of the pharmacy in the hospital "Madrasahi Dorush-Shifo" in Bukhara, operating in the 17th century, consisted of two pharmacists / 14, p. 124 /. They served mainly inpatients and prepared medicines according to the recipes of tabibs-doctors who worked in the hospitals. Pharmacies were also available at hospitals in Samarkand, Merv, Herat, Ree, Tabriz, Khamadan, Shiraz, and other cities.

Table 1.
Conclusion

Thus, the study of historical information (written sources, waqf documents, archaeological data) and modern historical literature relating to the history of the architecture of the Muslim East, showed that during the Middle Ages in many eastern cities with regulated beneficence of public officials (caliphs, local rulers, viziers and city nobility), as well as with the active participation of medical scientists, the construction of civilian hospitals (bemaristans, Dor-us-Shifo, shifokhana), medical schools count (madrasahiDorush-Shifo), pharmacies (dorikhana), as well as bazaar drug shops (murabba-a, dorusozkho).

Medical institutions were indispensable components of the social and functional infrastructure of the medieval cities of the East. Hospital facilities were built both as independent objects and as part of complexes with a madrasah or a mosque, and sometimes together with baths, often composing magnificent architectural ensembles with them. However, the bulk of medical buildings in cities were built independently.

In Central Asia, unlike other countries of the East, the construction of hospitals in complex with a mosque was not practiced. The hospitals were mainly built near the madrasah, creating a medical school with a “clinic” (for example, Samarkand, Kherat and Balkh hospitals). There have been cases when the functions of the hospital and the madrasah were united in the same building, such as, for example, the "MadrasahiDorush-Shifo" in Bukhara. Central Asian hospitals sometimes had several departments — eye, therapeutic, surgical, and psychiatric. For example, it is known that in the Merv hospital, apart from other departments, there was a psychiatric hospital, and in Kunya-Urgench, according to Beruni, there were surgical and eye treatment departments.

In the cities, pharmacies were provided mainly at large and multi functional hospitals and palace mosques. At small urban hospitals, there were only pharmacy facilities. Some of the self-contained pharmacies that included several premises included an “outpatient” department that provided medical care for visiting patients. Pharmacy-medical service was sometimes provided at the inns on the caravan routes in order to assist travelers and workers of caravanersais and rabats. In the cities, there were also home pharmacies where medicines were sold according to the prescriptions of the famous tabibs-doctors. Pharmacies were also available in medical schools, in which pharmacy gardens were often part.

Civilian hospitals, medical schools, self-built pharmacies, drug stores at hospitals and medical schools, home and palace pharmacies, as well as bazaar pharmacies - all this, taken together, formed the basis of hospital care and drug supply and was a "hospital pharmacy" medieval cities of the East and including Central Asia.

The principles of Islam, such as charity, piety, tidiness and cleanliness, have, in the future, a huge influence on the formation and construction of medical, healing and charitable institutions. These institutions as mosques and madrasahs played an important role in the life of the peoples of the Muslim East.

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