

FOR REFERENCE

NOT TO BE TAKEN FROM THIS ROOM

OTTOMAN MEDICAL INSTITUTIONS
AN ARCHITECTURAL ANALYSIS

by

TÜLİN ALMAS

B.A. in Arch., İTÜ, 1984

Submitted to the Institute for Graduate Studies in
Social Sciences in partial fulfillment of
the requirements for the degree of
Master of Arts
in
Art History

Bogazici University Library



39001100317331

14

Bogaziçi University

1986

OTTOMAN MEDICAL INSTITUTIONS
AN ARCHITECTURAL ANALYSIS

APPROVED BY

Prof. Dr. Aptullah KURAN
(Thesis Supervisor)

Aptullah Kuran
.....

Doç. Dr. Zafer TOPRAK

Zafer Toprak
.....

Yrd. Doç. Dr. Selçuk ESENBEL

Selçuk Esenbel
.....

DATE OF APPROVAL 21 November 1986

199985



FOREWORD AND ACKNOWLEDGEMENTS

During the Ottoman era as well as in the early Islamic and Turkish countries, great emphasis was placed on the construction of health institutions. In addition to the others built by the Ottomans which are no longer extant, this emphasis is evident in the eight great complexes which include endowed hospitals. Considering this fact, I have attempted to make an architectural analysis of Ottoman health institutions from the perspective of the historical development of hospital architecture which, unlike several other types of structures, have not been subjected to extensive study.

With the intention of making a comparative analysis I have, in the first section, researched the hospitals from the pre-Ottoman era as far as I was able to gather information from written documents. Since many of these earliest hospitals have not survived, my studies have been restricted to the limited architectural information provided by literary references. Several of those erected during the Seljuk period are extant, whereby the examination of their architectural characteristics in order to make a comparison with the Ottoman hospitals and to follow the development of hospital architecture becomes more feasible.

In the second and main section, I have studied individually the architectural characteristics of hospitals erected during the Ottoman era, starting from the beginning up to the absorption of western influences. Those extant include eight hospitals that have been built between the

years 1390 and 1616 as parts of complexes endowed by sultans. With the aim of making an architectural analysis any information relating to their administration or to medical developments as well as their decorations has been excluded.

In the Turkish-Islamic countries hospitals have acquired various names such as bîmaristan, şifaiye or darüşşifa. Although all of these terms are synonymous, the hospitals erected during the Seljuk era are referred to as şifaiyes, while those built by the Ottomans are spoken of as darüşşifas.

The following and the last section is an analysis which comprises a general study of the architectural features of Ottoman hospitals. By making a comparison with the Seljuk şifaiyes in order to trace their origin and to follow the changes the Ottoman hospitals went through, I have tried to emphasize the peculiar style, the individuality, of Ottoman hospital architecture.

I would like to acknowledge my indebtedness to Prof. Dr. Aptullah Kuran, who contributed greatly to this work, for his encouragement and invaluable guidance. I would also like to express my deepest gratitude to my family who with infinite patience revised the text and helped me in taking the photographs. Finally, I owe a great debt to my colleague Rita Arap for her support as well as for her kindness in supplying me with several articles and books.

ABSTRACT

From the architectural point of view, the hospitals erected during the Ottoman era are among the least-studied types of structures. Hospitals constructed especially in the 15th and 16th centuries reflect the architectural features of the Seljuk, and even early-Islamic structures. The earliest hospitals are only known to us through literary references which provide information mostly concerning their administration. Those that have survived from the early-Islamic period, on the other hand, form the origin of Ottoman hospital architecture. Actually, we can trace the origin of Ottoman hospitals to an even earlier date where we find the origin of medreses, in the Central Asian houses or Buddhist viharas. The remarkable changes and improvements that took place in the development of medical science and the treatment methods through centuries are not observed in the architecture of the hospitals. The major architectural changes in the Ottoman hospitals started after the 17th century with the influences of the West. Those erected during the 15th and 16th centuries bear the characteristics of the Classical era and actually represent Ottoman hospital architecture. While following the pre-Ottoman tradition with their plan-scheme they created a peculiar style in the arrangement of spaces as well as in some architectural elements. Although they were the successors of the Seljuk hospitals, unlike them, they were built as a part of a great complex, and in addition to their general arrangement they are more orderly, geometrical and plain in their mass. Some changes are also

observed in the architectural elements. The fact that these hospitals were always planned in a complex and in close relationship with the medrese shows that they were not just a shelter for the sick, but that illnesses were treated by physicians who were trained in the medical school, and that the yakif met the expenses and provided free cure to the patients. This emphasizes the importance given to health institutions and medical developments during the Ottoman period.

ÖZET

Mimari açıdan ele alındığında Osmanlı döneminde inşa edilmiş olan hastahaneler en az araştırma konusu olmuş yapı tiplerinden biridir. Özellikle 15 ve 16. yüzyıllarda inşa edilenler Selçuklu ve hatta erken-İslam yapılarının mimari özelliklerini yansıtır. İlk hastahaneler konusunda ancak yazılı kaynaklardan edinebildiğimiz bilgiler genellikle bunların yönetimi ile ilgilidir. Erken-İslam döneminden günümüze ulaşabilenler ise Osmanlı hastahane mimarisinin kökenini oluşturur. Osmanlı hastahanelerinin kökeni aslında daha öncesinde, medreselerin kökeninin uzandığı Orta Asya evlerinde ya da Budist viharalarında bulunabilir. Yüzyıllar boyunca tıbbın ve tedavi yöntemlerinin gelişiminde meydana gelen değişimler ve ilerlemelere hastahane mimarisinde rastlanmaz. Osmanlı hastahane mimarisindeki esaslı değişiklikler 17. yüzyıldan sonra batı etkileri ile başlar. 15 ve 16. yüzyıllarda inşa edilenler ise Klasik dönemin özelliklerini taşır ve Osmanlı hastahane mimarisini temsil eder. Bu yapılar plan şemaları ile Osmanlı öncesi gelenegini sürdürürken hacimlerin yerleşiminde ve bazı mimari elemanlarda kendine özgü bir stil yaratır. Selçuklu hastahanelerinin devamı olmalarına rağmen onların aksine büyük külliyelerin birer parçası olarak inşa edilen bu yapılar genel yerleşim planının dışında kendi içlerinde de daha düzenli, geometrik ve mütevazı bir mimari sergilerler. Mimarının bütününde olduğu gibi yapı elemanlarında da bazı değişiklikler gözlenir. Hastahanelerin bir külliye içinde ve medrese ile birlikte tasarlanmaları bunların

hastaları barındırmasının yanı sıra hastalıkların tedavisinin tıp medreselerinde yetişen doktorlar tarafından yapıldığını ve harcamaların vakıf tarafından karşılanarak hastalara parasız tedavi sağlandığını gösterir. Böylece Osmanlı döneminde sağlık kuruluşlarına ve tıbbi gelişmelere verilen önem vurgulanmaktadır.

TABLE OF CONTENTS

	Page
FOREWORD AND ACKNOWLEDGEMENTS	iii
ABSTRACT	v
ÖZET	vii
I. INTRODUCTION	1
II. HOSPITALS FROM THE PRE-OTTOMAN ERA	
A. Early-Asiatic	5
B. Greek and Roman	6
C. Early European	8
D. Byzantine	11
E. Early Islamic and Turkish	14
F. Anatolian Seljuk	19
III. OTTOMAN HOSPITALS	25
1. Darüşşifa of Yıldırım	31
2. Darüşşifa of Fatih	35
3. Darüşşifa of Bayazıd II	37
4. Darüşşifa of Hafsa Sultan	42
5. Darüşşifa of Süleymaniye	43
6. Darüşşifa of Haseki	46
7. Darüşşifa of Atik Valide	49
8. Darüşşifa of Sultan Ahmet	51
IV. ANALYSIS	54
V. CONCLUSION	70
GLOSSARY	74
BIBLIOGRAPHY	75
PLATES	86

I. INTRODUCTION

The origin of the history of medicine can be traced back to the beginning of mankind. The needs of the first men probably initiated the first medical treatments which were learned by experience. — These methods of treatment, adopted by the primitive communities and descended through generations by traditions, form the origin of contemporary medical science. Written documents of ancient communities as well as some finds recovered through excavations such as skulls of primitive men give information about the application of various surgical operations. (Ünver, Tıb Tarihi, 19). There are many similarities between the regional medical customs of ancient societies and of those living in the same areas today. Numerous examples gathered from the medical customs still in use among the people of Anatolia demonstrate their resemblance to the customs of Sumerians, Hittites and Uigurs. (Ünver, Tıb Tarihi, 15).

In the development of Turkish medicine a great number of books written or translated by Turkish scientists have played an important role. Until the 14th century, Turkish physicians wrote their medical works in the Arabic and Persian languages which were accepted as the scientific languages in the Islamic world. These books elucidated the methods applied in the treatment of various illnesses, as well as giving information about the organization of hospitals. Numerous medical works of Seljuk physicians written in Arabic and Persian have been

found.(Ünver, Tib Tarihi Esasları, 9). During the Ottomans, however, starting with the 14th century, some Arabic and Persian medical books were translated into Turkish and the earliest books in Turkish were written. In the following centuries translations and the writing of books in Turkish continued.

The local medical customs which descended through the centuries, medical knowledge of the Central Asian nations, of Iran, India, Egypt and China, and the translations of medical books into Arabic influenced to a great degree the development of Islamic medical science, which evolved through the intermingling of the sciences of various countries. The medical science of the Turks whose cultural values originated from Central Asia and in whose culture and arts we see similarities with some other Islamic countries, influenced and was influenced by that of some nations the Turks had relations with.

The exchange of scientists and physicians between countries also had notable effects on the evolution of medical science through the expansion of medical knowledge and various treatment methods. This exchange must as well have had an influence on the development of hospitals both from the administrative and the architectural points of views.

During the Ottoman era, relationships with Europe concerning medicine were initiated after the conquest of Istanbul and developed in the 16th century with the exchange of drugs. Physicians who came from the West, the

medicines and books they brought with them, improved the relationship and introduced western medical science to the Ottomans. European physicians who settled here and Turkish physicians who learned the European languages translated several works into Turkish. At the end of the 18th century students were sent to Europe to be educated in the science of medicine. The exchange of drugs and medical knowledge continued until the 19th century. Turkish medicine was influenced by western medical works and ideas, yet it did not relinquish the Islamic principles until the 19th century when it totally turned to the West.

As in the case of medical customs and treatment methods, architectural features of medical institutions have also descended through the centuries. While those erected during the Seljuk era demonstrate the early-Islamic architectural characteristics, hospitals built by Ottomans before westernization can be defined as a continuation of Seljuk hospitals. We discover the origin of the architecture of Ottoman hospitals in the early-Islamic and pre-Islamic periods. The earliest hospitals are only known to us through documents; mostly we are provided with information relating to their administration and functioning and also to the types of patients accepted as well as the methods of treatment applied. Usually we do not meet with architectural descriptions in the documents, and since most of these institutions do not exist today, we can only make assumptions with

regard to their architectural features. According to available documents, earliest institutions which sheltered the sick and provided medical treatment existed before the advent of Islam and Christianity; they must have played an important role in the development of hospitals both in regard to their administration as well as their architecture. The earliest hospitals that have survived display a similar plan scheme and architectural elements as the Seljuk hospitals. Ottoman hospital architecture continues the same tradition yet at the same time brings a new trend, a different interpretation to the traditional style.

A notable feature of the Ottoman hospitals is that they were endowed establishments like other institutions with which they were usually erected together forming a complex of buildings, the social center of the town. Documents state that these medical institutions not only sheltered the sick but also provided medical care applied by trained physicians. We learn that the doctors who were in charge of the patients also gave medical lectures in medreses as well as offering practical training in hospitals. This fact, which displays the close relationship between medreses and hospitals where theoretical and practical training of medical science was conducted simultaneously provides an explanation for their parallel architectural development.

II. HOSPITALS FROM THE PRE-OTTOMAN ERA

A. Early Asiatic

Earliest institutions where the sick were sheltered and received medical treatment existed before the advent of Islam and Christianity in Central Asia, China, India, Egypt, Mesopotamia and in Greece and Rome.

In China several hospitals were established during the Chou Dynasty in 1122-249 B.C. Chinese historical documents mention that in 300 B.C. there were health institutions for the insane, the blind, the deaf and the crippled. (Terzioğlu, *Türklerin*, 804). Several hospitals also existed in India in 437 B.C. during the reign of King Pandukaphayo and an early health institution was founded by the Kiptî emperor Managius ben Osmun in Egypt before Islam.

One of the most important health institutions before Islam was established in the city of Jundishapur in Iran in the year 350. It consisted of a medical school and a hospital where many great physicians were trained and which continued to function after the conquest of Iran by the Muslims. It became the center of medical studies and remained so for centuries, and it must have played an important role in the establishment of other Islamic hospitals.

Ibn Fazlan (10th century) writes in his book of travels that in the Central Asian nomadic Turkish tribes the sick were kept in separate tents until they recovered or died. (Terzioğlu, *Türklerin*, 803).

Buddhist monasteries called vihara established by the Turks in China and India were at the same time institu-

tions where medical training was given and the sick received shelter and medical treatment. The hospital erected by the Buddhist king Kasappa IV (898-914) in Ceylon consisted of two attached, rectangular buildings arranged around interior courtyards very similar to the Çifte Medrese erected by the Seljuks in 1205 at Kayseri. (Terzioğlu, Türklerin, 807). It is likely that these early Buddhist complexes were the prototypes of the Seljuk complexes consisting of a hospital and a medrese. The hospitals built in China and India by the Buddhist Turks and those built in Egypt, Iran and Iraq during the Middle Ages are the earliest examples of the Turkish and Islamic health institutions and form the origin of the Seljuk and Ottoman hospital architecture.

B. Greek and Roman

The origin of the Seljuk and Ottoman medical institutions can also be traced to the early Greek and Roman cultures.

Adopted from the Egyptians by the Greeks, Asklepios was worshipped in pre-Roman times as the God of health; later during the Roman period he was accepted as Aesculapius and given the same importance. Health temples known as the Asklepeon were erected, the most outstanding of which were founded in Epidauros, Kos and Pergamon. During the Roman era other health institutions besides these Asklepiens called the Valatudinarien were established by the state or the landowners for the workers or the army. After Christianity was accepted as the official religion of the Roman Empire the

Asklepions were shut down by Emperor Konstantin in 335 A.D.

As in the Asklepions, in some Seljuk hospitals such as the Kayseri (1205), Çankırı (1235), and Kastamonu (1272) şifaiyes there was a snake motif engraved on stone. The snake motif, emblem of Asklepios, god of health and therapy in Greek mythology was, according to Önge, adopted by the Seljuks in the 13th century and used as the symbol of health in the hospitals.(Önge, 252). Maristan and bimaristan, names given to the medical institutions during the Seljuks, might have been derived from the word "mar" which in the Persian language means snake. Also bimar meant "ill" and timar was "to cure". Since the snake motif was adopted as the symbol of health, the words maristan, bimaristan and bimarhane might have meant "the house of the snakes" intended as a "health house".

During the reign of Emperor Vespasian professor doctors were trained for the army and hospitals were built for the wounded soldiers.(Uzluğ, 74). Several of these hospitals such as the Novaesium near Dusseldorf built in 100 A.D. were revealed in the excavations. Also great emphasis was placed on the importance of water; many baths and health giving hot water springs were built during the Roman era.

Later, during the Seljuk and Ottoman periods we see a parallel development when, in addition to the hospitals, many baths and hot water springs were established, displaying their consideration for water and cleanliness.

C. Early European

Unlike the Islamic countries, institutionalized medical service was rare in western medieval countries. Christian hospitals were affiliated to religious institutions and were staffed by monks and nuns, providing "a semi-medical type of practical nursing" adapted to the care rather than the cure of the sick. (Mac Kinney, 3). Leprosaria were for the confinement of incurables. These hospitals had no connection with the universities where medical training was conducted.

In the Muslim Near East, on the contrary, endowed medical hospitals were institutionalized as early as the ninth century. They were secular organizations staffed with physicians who were devoted to the cure of the sick by applying medical treatment methods. (Plate 1). Medical training was also given in the hospitals which contained separate lecture halls. Thus theoretical and practical training was simultaneously provided to the students of medicine, while the sick received medical treatment. Islamic physicians who worked in these hospitals, in addition to training the students, also wrote books relating their experiences.

In Europe this type of institutionalized medical hospitals with well-organized staffs of physicians were not established before the 12th or 13th century. (Mac Kinney, 4) (Plate 2). The most outstanding of these were San Spirito in Rome, Hôtel Dieu in Paris and St. Bartholomew's hospital in London.

The first organized medical school in Europe was founded in Salerno near Naples in the eighth or ninth cen-

tury, and later its medical activities were transferred to the Naples, Montpellier and Bologne Universities. A renowned name of the Salerno school was Constantine from Carthage, who after traveling to Baghdad, Aleppo, Egypt and India for the study of medicine, returned to Salerno and spent the rest of his life translating Islamic medical books written in Arabic into Latin. Most of the medical books taught in the earliest universities in Europe such as Salerno, Padua, Montpellier, Sorbonne and Oxford were translations of Islamic books.(Terzioğlu, Ortaçağ, 147). The treatises of Ibn Sina, ar-Razi and el-Birûnî which had been translated into Latin were taught in the European universities as late as the 17th century, and many students from Northern and Western Europe went to Spain and Italy to study Islamic medical science.(Pope, 105).

The Islamic health institutions must also have had their influence on Europe through Spain. The intact portal of the Hopital de Latina (1499) in Madrid built by an Islamic architect named Hasan (Plate 3), and the plan of the hospital of Medina del Campo built in the 16th-17th centuries (Plate 4) display many similarities to the hospitals built by the Seljuks. According to Terzioğlu, the cross-plan scheme of the hospitals in Europe such as the Ospedale Maggiore (1457) in Milan was based on the early Islamic hospitals, especially the hospital of Kalaun (1284) in Cairo. (Terzioğlu, Ortaçağ, 144-147).

The influences of Islamic culture upon western Europe which had been introduced earlier by the Arabs in Spain and Sicily was further assimilated through the Crusades and

the translations of Islamic books into Latin during the Seljuk era. According to Atiya, the introduction of machicolation in military structures, the use of public and private baths, the manufacture of stained and enamelled glass, and the stone carving and moulding which laid the foundations of the Gothic style were transmitted to the West through the Crusades.(Atiya, 125).

The institutions of the Hospitallers and Templars, the most prominent of the monastic fighting forces of the Crusaders, were protected by the papacy and though they originated primarily for military purposes they also had charitable and hospitable duties. Apart from the hospital which was maintained at the headquarters first in Jerusalem, then in Acre, Limassol and Rhodes, the Hospitaller's houses throughout Europe sheltered pilgrims and other travelers, cared for the sick, and in many cases housed elderly people as pensioners.(Luttrell, 327).

The need to build hospitals during the wars between the Crusaders and the Seljuks played an important role in the development of hospitals and of medical science. The hospital of Nureddin Zengi, a Seljuk commander, was established in Damascus with the booty taken from the crusading armies. The hospitals he erected in other cities such as Aleppo, Hama, Tripoli, Nusaybin, as well as those in Cairo, Alexandria, Akka and Jerusalem erected by Salahaddin Eyyubi, must have influenced the hospitals the Crusaders built in Jerusalem, Rhodes and other cities. Atiya states that by 850 A.D. 34 hospitals were in existence in the Arab world. (Atiya, 231). There were also separate hospitals for women and schools of

medicine attached to hospitals which offered training as well as surgical practice.

D. Byzantine

Although we don't have much knowledge of Byzantine hospitals, Eyice's recent studies provide us with some valuable information about several of these health institutions. Besides the inscriptions on gravestones belonging to Byzantine physicians, documents called "typikon" in which the administrative principles of the monasteries were written, form an important source of information about Byzantine medicine and hospitals. The earliest hospitals were established in the fourth century. In about 370-375, the archbishop of Kaisareia (Kayseri) Basileios had a hospital built outside the walls of the city. It was almost as large as a small town where all kinds of illnesses, injuries and leprosy were cured. It also contained a hospice for travelers and lodgings for the doctors and other staff. In 398, a similar institution was established by the patriarch of Byzantium Joannes Khrysostomos in the capital city. Several leproseries were founded in the fourth and fifth centuries in Antioch, Alexandria, Palestine, Edessa, Argyronion (Beykoz), and Yalova. Another early Christian hospital into which the poor and the injured were brought was the one built in Sivas in the second half of the fourth century by bishop Eusthathios. It was possibly both a treatment center and a shelter for the poor. Eyice defines this institution as a "xenon", which sometimes was a hospital, sometimes a

hospice and sometimes an old people's home. (Eyice, 143). An inscription found revealed that a xenon was built by Justinianos in Pamphylia in the sixth century. Eyice claims that the ruins of a two-story structure excavated near the remains of the palace of the archbishop in Side could be the Kosmas and Damianos xenon mentioned in the inscription, since Side was the most prominent city of Pamphylia. (Eyice, 144). Several other xenons are; Arkadios xenon built by Justinianos and Theodora near St. Sophia, Ebuluos xenon near St. Sophia which was burnt in 532 and restored, xenon near Evergetis Maria (Theotokos) Monastery which comprised an inn and a hospital, xenon near Myrelaion Monastery (now Bodrum or Mesih Paşa mosque) built by Emperor Romanos I Lekapenos (920-944), xenon in the Mangonoi quarter near the Topkapı Palace built by Emperor Konstantinos IX Monomakhos (1042-1055), and the Sampson Xenodokheion built by Justinianos near St. Sophia, the ruins of which came to light in an excavation in 1945. During the reign of Emperor Theophilos (829-842), a two-story hospital for lepers was built in Nikomedeia (Izmit). The Panagia Kosmosoteira Monastery built by Sebastokratoros Isaakhios Komnenos in the village of Pherrai (Ferecik) in Thrace also contained a hospital equipped with 36 beds where all kinds of illnesses were treated.

The most renowned Byzantine hospital was built in 1136 by Emperor Joannes II Komnenos and his wife Eirene near the Pantocrator Monastery. The "typikon" which was found in the library of the Greek theological school in the Chalki (Heybeli) island stated that the hospital accomodated

50 patients, including 12 beds for women. The patients were distributed into five halls. In each hall for men there were two doctors, three permanent assistant doctors, two auxiliary assistant doctors, two nurses totaling a staff of 36 for 38 patients; and in the women's section three doctors, six assistant doctors and two or three nurses which makes a staff of 11 or 12 for 12 patients. Among the rest of the staff were included four chemists, two cooks, one priest and four grave-diggers. There was also an instructor for medical education. This health institution also contained a leproseriy and an old people's home, and there was a separate infirmary with six beds for the monks of the monastery. After the discovery of its typikon, a Greek doctor named Kodellas published a sketch of the hospital. Another plan of the hospital showing the different sections arranged around a courtyard was published by an art historian and Byzantologue A. Orlandos.(Plate 5). The Pantocrator Monastery was later occupied by the Crusaders to be used for other purposes and the hospital was no longer in function in the 13th century.(Eyice, 151).

The private palace of Andronikos I Komnenos (1183-1185) located between the Çemberlitaş and Çarşıkapı quarters, was converted into a hospital by his successor Isaakhios II Angelos (1185-1195). In this area a great cistern which possibly formed the substructure of the hospital was excavated.(Eyice, 152). Two more health institutions were established after 1261. The first one called xenon tou Kralou built by King Uros II Milutin (1282-1321) was near the Prodromos Petra Monastery between Karagümruk district

and the Golden Horn and contained a medical school. The other one was the hospital of the Lips Monastery, originally founded by Konstantinos Lips in the 10th century and restored in 1284. It was established for women and contained only 12 beds.

According to Eyice, the Byzantine hospitals display a totally different characteristic from that of Seljuk. Although the above mentioned inscriptions and documents form an invaluable source of information regarding their existence and management, our knowledge about the architectural features of Byzantine hospitals is very limited, since many of these structures have disappeared and the excavated ruins do not provide sufficient evidence as to their function.

E. Early Islamic and Turkish

Numerous hospitals were erected before the Seljuk era during the Umayyads and Abbasids. Since neither of these early hospitals remain, it is difficult to make a comparison between them in an effort to trace their origin.

One of the earliest Islamic hospitals was erected in Damascus in 706-707 by the Umayyad Caliph el-Velid bin Abd ül-Melik. All kinds of patients including the lepers and the blind were received and sheltered there. Another bimaristan was established at Fustat (Cairo) in Ebu Zübeid's house during the Umayyads. (Terzioğlu, Ortaçağ, 128).

Many hospitals were established in Baghdad during the Abbasid period. Among these were a hospital erected

in 786-809 by Cibril Ibn Bahtışua and a bîmaristan in el-Harbia built in 914 by Ali bin Isa Ibn el-Garrah. Several other hospitals were instituted in Antioch, Merv, Rayy, Shiraz, Isfahan, Raqqa, Harran and Nusaybin. In Egypt, Ibn Tolon erected a hospital and a bath beside his mosque in 872-874 which, according to el-Makrizi's definition, contained a separate section for the insane. (Terzioğlu, Selçuklu, 56). Bîmaristan el-Ihşid instituted by the Ihşids in 957 in Fustat, and the hospital of Adudî constructed in 978 in Baghdad are among the renowned Turkish-Islamic hospitals erected before the Seljuks.

The Seljuks, besides improving the existing hospitals also erected numerous new hospitals. The earliest Seljuk hospital was established by Nizam ül-Mülk (1063-1092) in Nishapur. (Terzioğlu, Ortaçağ, 130). The Nizamiye medrese in Baghdad erected by Alp Arslan in 1066 also included a hospital. Several hospitals were erected by Ahmed Kâşî, the vizier of Sultan Sencer (1084-1157), in Kas-han, Ebher, Gence, Zencan and Erran. In Baghdad, Melikşah's brother Tutuş bin Alp Arslan had Bîmaristan et-Tutuşî built by Kimartekin near the Tutuşîye medrese, and another hospital was built in Bab el-Garabah in Baghdad. The Seljuk atabeg Ebu Bekir bin Sa'd-i Zengi (died 1210) established the Darüşşifa-i Muzafferî at Shiraz. The Mustansariye medrese built by Caliph el-Muntasır offered medical training and included a hospital.

Several hospitals are also known to have been erected during the Ilhanid period in Iran. Some of them, no longer extant but only known through literary references,

are a pharmacy (dar ü-hane) and a darüştifa at Hamadan founded by Reşid üd-din, Gazan Han's (1295-1304) vizier, and a hospital at Shiraz founded during Ebu Sa'id (1316-35). (Wilber, 190). Gazan Han also had a complex built in the suburb of Sham, two miles south of Tabriz, which consisted of 12 buildings and included a hospital. (Pope, 171). Reşid üd-din established a university in Tabriz which surpassed the earlier complexes and included several hospitals. (Pope, 172).

The earliest Seljuk hospital that has survived in its original form is the hospital of Nureddin Şehîdi Türkî erected in 1154 in Damascus by Atabey Nureddin Zengi. (Plate 6). Ibn Jubair, who had traveled to Damascus in 1184, gives in his book of travels information about the hospital and mentions that special treatment methods were applied to the mental patients. (Terzioğlu, Ortaçağ, 131). This early Seljuk hospital built in the typical four-iwan medrese scheme arranged around a courtyard displays the architectural features of early Turkish-Islamic hospitals.

The Atabey of Mosul (Erbil) Muzaffer üd-din Ebu Sa'id Gökbörü also had a hospital erected in Mosul in 1156. In addition to the hospital he built an orphanage and four poorhouses for the blind. Salahaddin Eyyübî, the founder of the Eyyübî dynasty, erected hospitals in Jerusalem (1187) and Akka (1187). The hospital of Kaymeri Eyyübî erected in 1248 in Damascus displays common features with the Seljuk hospitals with a cross-axial, four-iwan scheme organized around a courtyard. (Plate 7). Kutlug Türkân of the Karatay dynasty had several charitable institutions built among

which was a hospital in Kirman (1281).

The hospital that the Mamluk Sultan Seyfeddin Kalaun erected in Cairo in 1284 is one of the most renowned of the early hospitals. Though it does not contain any inscriptions, Makrizi's registrations reveal that its construction was begun in 1284 (A.H. 683) and completed in the same year. (Creswell, Muslim, 209). According to el-Makrizi, the maristan of Sultan Kalaun had originally been the qa'a of Sayyedat ül-Mülk and later became a palace before being modified into a hospital. (Creswell, Muslim, 205). Sultan Kalaun took it from Mu'nise Hatun and had a hospital, a medrese and a mausoleum built. He formed a foundation to meet the expenses of the hospital, appointed physicians, oculists, surgeons and bone-setters to the hospital and allotted separate places for cooking, preparing the medicines and for the medical lectures. The maristan was built on a four-iwan scheme with a central courtyard. (Plate 8). Each iwan contained a sadırvan from which water flowed into the central basin. There was a separate ward for each disease; the iwans were reserved for those suffering from fever, there were other sections for surgical cases, for dysentery, for ophthalmia, and there was a section for convalescents where music was played. (Creswell, Muslim, 205). In the north were two courts surrounded with cells, the larger of which was for the insane men, the smaller for the insane women. The maristan of Sultan Kalaun ceased to be a hospital when the patients were transferred to the Mosque of Ibn Tolon in the early 50's of the last century, and the original form of the hospital was

destroyed in 1910 in order to provide room for the ophthalmic hospital planted in the center of the old maristan. (Creswell, Muslim, 206).

Numerous other hospitals erected by the Seljuks were; the hospital of Kaymerî (1308) in Damascus, the dar-üşşifa of Reşid üd-din (1310) in Tabriz, the hospital of Timur (1319) in Damascus, and the hospital of Ergun Kâmil (1354) in Aleppo.

The earliest hospitals in Anatolia were built by the Artukids. The complex erected in Mardin by the Artukid Sultan Necmeddin Ilgazi (1108-1123) and his brother Eminateddin included a maristan, one of the earliest health institutions in Anatolia. The külliyeye of Eminateddin was the earliest building complex in Anatolia, consisting of a mosque, a medrese, a bath, a hospital and a fountain. Although in general, considering the architectural form and decorations, Artukid structures are the inheritors of a different style, for they carry the traces of the features of Syrian architecture, they also display the characteristics of later Anatolian Turkish architecture.

The Artukid medreses are the earliest examples of Anatolian open type medreses. Early medreses like that of the Eminateddin külliye are built on a four-iwan scheme and are arranged around an arcaded courtyard. Vaults covering the spaces and stone ornamentation are common features. One of their most prominent characteristics is that they don't have the symmetrical form of Seljuk medreses.

The only reference relating to the maristan of Eminateddin which does not exist today, is gathered from the registrations up to the 19th century (Altun, 73), after the fall of Mardin under Ottoman rule in 1517. These documents revealed that the maristan was run by a single doctor. We don't have any information about the architectural features of the maristan which was already in a ruined state in 1537 (Altun, 73), though we can surmise that it possessed similar characteristics with the medreses, and that the darüşşifa of the Eminateddin külliye built in the early 12th century was the earliest health institution displaying the plan type later established in Anatolia.

F. Anatolian-Seljuk

Considering their architectural features Seljuk hospitals can be defined as the predecessors of Ottoman darüşşifas. They possess similar characteristics with regard to their plan schemes and arrangement of spaces. For this reason, I shall study several extant Anatolian-Seljuk hospitals from the architectural point of view in order to be able to make a comparative analysis. In this section are included the hospitals erected by the Seljuks within the Anatolian peninsula.

An early Anatolian-Seljuk hospital was constructed in 1205-1206 in Kayseri by Gıyaseddin Keyhüsrev and his sister Gevher Nesibe Hatun and consisted of a medical school and a şifaiye. (Plate 9). The medrese and the şifaiye of Gevher Nesibe Sultan, also called Çifte Medrese

are attached to each other and both are of the open-court four-iwan plan type. (Plate 10). If some differences of detail such as sizes and shapes of the rooms and the courtyard are not taken into account both possess similar characteristics. The entrance into the şifaiye, unusually, is on the left of the façade placed on the axis of the western arcade. Arches surround the square courtyard on three sides containing three arches on each side, whereas on the fourth side in front of the main iwan there is only one large arch. The main iwan opens into the court and the rooms have small arched doors opening into the arcades; none of the rooms except the main iwan have windows. Both rooms and iwans are covered with barrel vaults. Between the şifaiye and the medrese a narrow passage which joins the two buildings shows that in the şifaiye medrese of Gevher Nesibe Sultan theoretical and practical training was performed simultaneously with the treatment of diseases.

The şifaiye of Keykâvus I at Sivas constructed in 1217-18 (A.H.614) also displays the typical medrese plan scheme. (Plate 11). According to several scholars, similar to the Çifte Medrese, it was a complex consisting of a şifaiye and a medrese, of which only the hospital exists today. (Kuran, Anadolu, 104; Sözen, Anadolu, I, 95). Tuncer, on the other hand, does not share the theory that the şifaiye of Keykâvus was attached to a medrese, but points to the possibility that a medrese flanking the şifaiye on the southern side might have existed. (Tuncer, 920). The medrese-i Seljukiye stated in the vakfiye was possibly a separate structure on the eastern side. A different

arrangement is seen in the arcades which extend to the outer walls. The entrance section consists of four rooms opening into the vestibule and two iwans opening both into the vestibule and the central court. This was possibly the administrative section of the hospital. Since no discoveries relating to the functions of the rooms were made in the excavations, we can only make assumptions in relation to the utilization of each room. The şifaiye also contained a türbe placed across the side iwan on the northern side which was single storied unlike the traditional Seljuk kümbets.(Tuncer, 916). The cells are equipped with fireplaces and windows which Tuncer claims to be later additions.(Tuncer, 917-918). Like the medreses, Seljuk şifaiyes usually contained very small windows at a high level or no windows at all. Considering the fact that much emphasis must have been placed on the privacy of the interior, especially of a hospital, I think it is likely that the windows were opened later. Traditionally, the exterior walls were constructed of stone while the interior walls between the cells were of brick. The floor of the cells, the arcades and the iwans were covered with hexagonal bricks, the entrance vestibule, the courtyard and the front of the türbe were faced with stone. If we do not take into consideration the small peculiarities, we can define the şifaiye of Keykâvus I as a typical Seljuk hospital.

Another Seljuk complex containing a şifaiye was constructed in 1228-1229 (A.H.626) in Divriği, and was named after its founder Turan Melik, the daughter of Fah-

reddin Behram Şah. In this case the şifaiye does not adjoin a medrese as does the şifaiye of Gevher Nesibe, but the Great Mosque. Unlike the other Seljuk hospitals, the şifaiye of Turan Melik displays a different characteristic in that it is the enclosed type.(Plate 12). Although built on a cross-axial scheme with three iwans it follows the enclosed medrese tradition. The central courtyard is surmounted with a vault resting on four pillars; the vault has an oculus and an octagonal pool beneath. The şifaiye consists of a main iwan, two smaller side iwans with vaulted rooms and a domed türbe in between. Traditionally, the dominant element of the building is the richly ornamented monumental portal.

Among the other hospitals erected by the Seljuks was the şifaiye of Atabey Cemaleddin Ferruh in Çankırı, which was constructed in 1235 (A.H.633) during the reign of Alaeddin Keykubad. Only its inscription and a stone relief of a snake motif remain.(Plate 14). The şifaiye of Ali bin Pervane in Kastamonu (1272-3/A.H.671) was built by Sa'd of Kayseri in the typical Seljuk medrese plan scheme with rooms and iwans surrounding a courtyard.

A şifaiye known as the Gök Medrese was erected by the vizier Muinüddin Süleyman Pervane in Tokat around the year 1275.(There is no inscription). It is a two storied structure constructed of rubble, and displays the typical two-iwan medrese plan-scheme.(Plate 15). The main iwan is flanked by a mescit on the east and a türbe on the west. Flanking the türbe is a domed room which might have been the library and the vaulted room next to it the winter

classroom.(Kuran, Anadolu, 97). These spaces are all two stories high. A stairway at the north eastern corner leads to the upper floor which consists of vaulted rooms equipped with small windows opening outside. The interior of the Gök Medrese is decorated with tiles, and typically, the most prominent element of the structure is the monumental portal.

Another hospital was built during the reign of Ilhanid Sultan Olcayto Mehmed and his wife Ilduz Hatun in Amasya by Amber bin Abdullah in the years 1308-9 (A.H.708). The şifaiye of Ilduz Hatun was built on an axial scheme with two iwans, the main iwan and the entrance iwan.(Plate 13). Between the iwans are vaulted rooms arranged around an arcaded courtyard. The şifaiye was constructed of regular cut stone, and its most outstanding element is the richly decorated portal.

Several şifaiyes also existed in Konya. The şifaiye of Alaeddin, the şifaiye of Kemaleddin (Küçük Karatay), and the şifaiye of Şadi Bey were erected between 1219-33, but do not exist today. Others no longer extant are the şifaiye of Sahip Ata in Akşehir (1260), the şifaiye of Toruntay in Amasya (1266), şifaiyes in Erzurum and Erzincan, the darüşşifa of Ata Bey in Kastamonu (1270-5), the darüşşihha of Rahatogulları in Sivas (1288), a darüşşifa in Kütahya (13th century), the leproserly of Zülkadiroğulları in Kayseri, the şifaiye in Aksaray (1337), and the şifaiye built by Emir I Şemseddin (died 1423) in Bitlis.

There were also mobile hospitals carried by camels in the Seljuk army during the reigns of Sultan Melikşah and Sultan Mahmut. (Ünver, Tıb Tarihi Esasları, 9; Terzioğlu, Selçuklu, 55).

III. OTTOMAN HOSPITALS

The şifaiyes constructed by the Seljuks continued to be used by the Ottomans who erected new hospitals only in the cities where there were no hospitals. The earliest of these hospitals was established in the first-capital city, Bursa, during the reign of Sultan Yıldırım Bayazıd I. It was constructed in the years 1390-1394, and was named after its founder Yıldırım Bayazıd. It went through several repairs and functioned until the 19th century.

After its conquest, a multitude of buildings were constructed in Edirne which became an important political center after Bursa. Among the constructions were included a leproseary established by Murad II (1421-1451) which existed until the 17th century, and a darüşşifa in the complex of Sultan Bayazıd II. The darüşşifa of Bayazıd II, erected in the years 1484-1488, is still intact displaying its monumental architecture.

The earliest medical institution established in Istanbul was the darüşşifa in the complex of Fatih constructed in 1470, a little after the conquest of Istanbul. Although the rest of the külliye is still intact, the darüşşifa of Fatih was demolished during the reign of Mahmud II (1808-1839), and is only known to us from documents.

Some records such as books written by travelers reveal the existence of a few hospitals which are no longer extant. Menavinus, for instance, who had visited Istanbul in 1573, mentions in his book of travels that besides the darüşşifa at Edirne, Bayazıd II had another hospital erect-

ed near his mosque in Istanbul where 40 patients received medical treatment from 150 nurses.(Terzioğlu, Ortaçağ, 136). Selim II (1566-1574) also had a hospital constructed in Istanbul. (Terzioğlu, Ortaçağ, 136).

The second known medical institution in Istanbul, the leproseary of Yavuz Sultan Selim constructed in Üsküdar in 1514, was also known as the Karacaahmet Miskinler Tekkesi. It functioned until the 20th century and gave way to new institutions after the 1920's.(Ünver, Tıb Tarihi Esasları, 10). Some documents reveal that the building contained 20 rooms with fireplaces, including a private bath and a mescit.(Doğan, 62). The tekkes established to meet the religious requirements of the dervishes of an order were also social and cultural institutions. In some, however, this cultural or social function was of prior importance. One type of these institutions was the "miskinler tekkesi" which was a hospital for lepers. In addition to the vakıfs established to support the tekkes, people's donations also provided money for the expenditures, and the patients received, particularly, moral support.

The earliest of the four hospitals constructed by Sinan was the darüşşifa of Hafsa Sultan erected in Manisa in 1539 and endowed by Kanuni's mother Hafsa Sultan. In the same year Sinan built a külliye in Istanbul for Kanuni's wife Haseki Hürrem Sultan. The külliye included a hospital which continued its activities until today. The darüşşifa of Haseki does not have an original inscription,

therefore the date of its construction is a subject of dispute I shall later discuss.

During the reign of Kanuni the Hippodrome (At Meydanı) was rearranged and various new buildings were constructed among which was a timarhane surmounted by small domes. (Atasoy, 12).

An extensive medical institution was the darüşşifa and medical school in the külliye of Süleymaniye established by Kanuni. The darüşşifa was a part of the second largest university town after the Fatih complex. Its construction carried out by Sinan was started in 1550 and lasted until 1557. It functioned until the 19th century as a hospital and was later adopted to different purposes.

The last health institution erected in the 16th century was founded by Nurbanu Sultan, the mother of Murad III. The vakfiye of the külliye, which was renowned as Valde-i Atik after the construction of another Valide Külliye (1708-1710) in Üsküdar, dates to 1582. (Kuran, Üsküdar, 235).

The darüşşifa of Sultan Ahmet was the only health institution built in the 17th century. It was erected in 1616 as a part of a külliye and continued its activities until the 19th century when it was demolished.

Several other hospitals which were established in the 18th century but do not exist today included: the Department of the Sick in the Old Palace (1722), the Department of the Sick of Galatasaray, the Department of the Sick of the İbrahimpaşa Palace, bimarhane at Hasbahçe (1785), Leventçiftliği hospital (1799) and Çinili hospi-

tal at Toptaşı.

Several hospitals were also instituted within the precincts of the Topkapı Palace. Within the outer walls of the palace stood the Gülhane hospital, Teşvikiye hospital, a medical school with its dormitories, and the Enderun hospital which was the first building inside the Bab-ı Hümayun to the right. In the Enderun hospital, patients from the Enderun section of the palace received treatment.

Inside the palace there was another hospital in the harem department.(Plate 16). Different sections of the harem department were used for various functions at various ages. The exact date when this department was established cannot be estimated though it is possible that some sections were planned during the reign of Fatih.(Eldem, 67).

From the courtyard of the women's quarter, a stairway lead down to the lower garden where the harem hospital was situated. The hospital consisted of rooms arranged around a courtyard.(Plate 17). The lower story contained a cell across the stairs, bath, kitchen, cell for the cooks, lavatories and a room for washing the dishes surrounding the courtyard.(Plate 18). On the upper floor were the laundry, lavatories, a storage room for the medicinal supplies and another room for their preparation, a ward and the upper gallery of the large ward below. Although it does not have a very orderly arrangement its plan scheme displays similarities with other Ottoman hospitals.

The harem department demolished through two great fires, was later completely rebuilt of masonry.

The Enderun hospital within the Topkapı Palace established by Sultan Mehmed the Conqueror was completely demolished as a consequence of a great fire in 1856-1857. (Terzioğlu, Enderun, 875). We can obtain some information about this hospital from the manuscripts of Alberto Bobovio who spent many years in the Enderun and wrote a descriptive work in 1665. In this work it is stated that medical science was also taught in the Enderun by Turkish and Jewish scholars.

In the plan drawn by Bobovio the Enderun hospital is shown inside the first court of the palace to the right of the Bab-ı Hümâyun, and consists of separate sections grouped around an interior courtyard. (Plate 19). These sections included to the left of the entrance the apartment of the Timarhane Ağası who was the director of the hospital. Flanking this apartment was the department of the woman servants who did the laundry of those belonging to the Enderun. Beside it were the hospital of the Has Oda of Enderun, and the hospital of the Hazine Odası. Next were the hospitals of the Enderun Büyük Odası, Seferli Odası and Küçük Odası. To the right of the entrance stood the hospital of the Hadımağalar. The ward beside the Bab-ı Hümâyun was inhabited by the Acemioğlans who were in charge of carrying the patients to the hospital. An iç-oğlan from the Enderun who became sick was, with the permission of the Kapı Ağası, wrapped up in a white blanket

and carried to a two-wheeled cart covered with red broadcloth. (Plate 20). The cart was pulled by two Acemioğlans and taken to the hospital. The patient was accepted into the hospital of the department he belonged to and was attended by the doctors and surgeons of the palace. Those who recovered were taken back to their department in the Enderun in the same manner on the two-wheeled cart, and those who died were, after a religious ceremony, buried in the Karacaahmet cemetery or in the cemetery of the Enderun at Kasımpaşa.

The hospital also included a bath which was situated near the entrance of the complex. In a plan drawn in 1744 depicting the water system of the Topkapı Palace it was shown that the Enderun hospital was also provided with water. According to this document, the hospital was still in use in mid 18th century. The hospital of the women's quarter in the palace, as well as the hospital of the Old Palace also included a separate bath.

Another work written and published by Tavernier in 1675 stated that two doctors and two surgeons from the palace paid a daily visit to examine the patients. Concerts were also given in the hospital. (Terzioğlu, Enderun, 882-883).

Bobovio was not an architect, but was trained as a musician, therefore his descriptions do not give sufficient information about the architectural features of the hospital. The schematic plan drawn by him does not depict the architectural form of the different sections of the complex; we only know that these sections were arranged

around an interior courtyard. However, his descriptions relating to the arrangement and the organization of the Enderun hospital which was burned down in the 19th century form one of the few and very important sources of information.

1. The Darüşşifa of Yıldırım Bayazıd

The Ottomans built their earliest hospital in their first capital city, Bursa. Being the first hospital, it occupies an important place in architectural as well as in medical history. The darüşşifa bearing the name of its founder Yıldırım Bayazıd was constructed during the years 1390 and 1394 as a part of a külliye consisting of a mosque, a medrese, a türbe, an imaret, a bath, a kiosk and a fountain. (Plate 21) (The vakfiye of the külliye is dated 1399-1400 (A. H. 802)). Despite their extremely ruinous condition, the remaining walls provide us with sufficient information about the original architectural features.

Generally speaking, regarding the plan scheme, it is a typical Seljuk şifaiye comprising the traditional elements; a courtyard surrounded by arcades and cells and a domed classroom. (Plate 22). These elements are arranged in a rectangle of 30x50 meters.

The entrance is at the center of the northern façade, 70 cms. above the street level. (Plate 23). A pointed-arched portal opens into a rectangular vestibule flanked by two rooms on each side, the vestibule itself leads into the central courtyard. The rooms flanking the entrance

hall are entered from the courtyard; there is no direct access from the vestibule. The two rooms to the right have a passage in between and contain ovens. On the side wall of the corner room at the right is a niche which Çetintaş defines as a window behind an oven. (Çetintaş, Murat I, 44). Ayverdi, on the other hand, states that at the rear of the oven was a thin wall of 20 cms. which was later destroyed and was not originally open. (Ayverdi, İlk Devri, 458). It also had a platform inside and was used to boil chemicals, whereas the other oven is at the floor level and was for heating the room. These two rooms with a passage in between were apparently for the preparation of chemicals and possibly also for the preparation of food since the staff of the darüşşifa included cooks. To the west of the entrance vestibule are two more rooms of which the smaller one at the corner contained the latrines. The larger one at the right was possibly the doctors' room.

The large rectangular courtyard is surrounded on three sides, the entrance side and the two longer sides, by an arcade consisting of square columns constructed of brick and covered with barrel vaults. Behind the arcades are the cells of the patients, 10 on each side of the courtyard, generally measuring 3.60 x 3.30 meters and each containing an oven and a window. Compared with Seljuk şifaiyes the cells are more homogenous and have larger windows, but traditionally they are surmounted by barrel vaults. At the end of the arcades flanking the central classroom symmetri-

cally on two sides are two rectangular halls also covered with vaults.

Despite the application of the traditional architectural elements and the Seljuk medrese plan scheme, a notable distinction is seen in the main iwan, which might have been the classroom where medical lectures were given or an operating theater as Kuran suggests. (Kuran, The Mosque, 18). Traditionally it is located at the end of the courtyard on the entrance axis emphasizing the axial arrangement, but it does not possess anymore the characteristics of the iwan opening into the courtyard through an arch; unlike the traditional Seljuk classroom it is closed. It is entered through an arched doorway and there is a similar arched window on each side of the door. On the opposite wall inside is a niche which was possibly an oven, and a window on each side of it. The room is rectangular and covered with a dome.

One of the most remarkable features of the Yıldırım darüßsifa is the adjustment of the structure to the slope of the land. (Plate 26). Generally in such situations, when a building had to be erected on a slope, a lower story was added to give the ground a level surface and the building was constructed on the horizontal plane. Unlike this usual solution, the darüßsifa of Yıldırım was constructed directly on the inclined land. The building was adjusted to the slope by elevating the cells through the use of stairs in the arcades; the cell nearest the classroom is on the highest level. The elevation of the cells in ac-

cordance with the slope of the land creates an effect of motion in the mass of the building.

The building was constructed of rubble; brick was employed in some places such as the columns in the arcades and also as a decorative element in the arches of the windows and on the walls.

The remaining parts of the darüşşifa are not completely original, since it had gone through several repairs as attested by some documents. (Çetintaş, Murat I, 39). The main repairs were conducted in the years 1618, 1649, 1668 and 1671, and comprised the roof, the cells and the şadırvan. The front façade, according to Çetintaş, is not original but was erected in the 18th century. (Çetintaş, Murat I, 39). It is possible that the darüşşifa was demolished in the earthquake of 1855 and was not repaired again. (Kuran, The Mosque, 18). From then on until 1944 it was utilized as a gun-powder mill.

As it is stated in its vakfiye, the staff of the darüşşifa included one head doctor and two doctors, pharmacists and a cook. Later the staff was augmented with a surgeon and an ophthalmologist. According to a record dating to 1622, the number of the staff had been increased including a second surgeon and a cook, a laundryman and a washer of the dead. The wages of the staff, the amount of funds to be set aside for the repair of the endowed establishments as well as the food to be served to the patients were also stated in the vakfiye. Mental and neurotic patients were also received into the hospital. The latest document relating to the administration of the Yıl-

dırım darüşşifa dated to 1755.(Ayverdi, İlk Devri, 457).

2. The Darüşşifa of Fatih

The second darüşşifa built by the Ottomans, which is the first in Istanbul, was founded by Fatih-Sultan Mehmed in 1470 (A.H.875). The Fatih darüşşifa was erected as a part of an extensive külliye consisting of a mosque with its türbes, a hospice, an imaret, a caravanserai, a primary school, a library and a bath in addition to the medreses which formed a university town and the first great social unit of Istanbul, and was constructed by the architect Atik (Old) Sinan.(Plate 25).

The darüşşifa was located on the south-eastern side of the mosque in the Destereciler market.(Plate 26). It was set across the lane outside the wall of the mosque precinct and the cemetery, in a square garden surrounded by walls which formed an outer courtyard.

Plan scheme of the darüşşifa was the traditional medrese scheme.(Plate 27). The rectangular vestibule behind the portal opened into the square courtyard surrounded on all four sides by a 16 domed arcade. Across the entrance was the typical closed classroom, which had an apsidal pentagonal niche on the exterior wall covered by a semidome. Ayverdi states that the four corners of the structure were domed, which were probably the two iwans and the two large rooms at the north-east and north-west corners.(Ayverdi, Fatih Devri Mimarisi, 156). The three cells to the right of the classroom and the three to the

left like the remaining cells were covered by vaults. On the eastern and western sides on the same axis were two narrow passages which lead to the outside. According to Evliya Çelebi, the darüşşifa had 70 cells and 80 domes, and there was a separate hospital for women and the non-Muslims. (Evliya, I, 52). The darüşşifa also had a kitchen of its own and a mescit which was the domed classroom. Goodwin calls it the Demirciler Mescit (Goodwin, 124), but Ünver claims that it was the darüşşifa mescit. (Ünver, Fatih Darüşşifası, 6-7).

The darüşşifa of Fatih was not only a hospital where the sick were cured; those who studied medicine in the medrese had their practical training there. Although there is no record in the vakfiye stating that medical training was given in the medrese, the small vakfiye indicates that there were rooms for the medical students in the darüşşifa. Evliya Çelebi also mentions that lectures were given in the darüşşifa. (Evliya, I, 174). The patients were treated kindly and there were singers and musicians who played for the sick. Doctors were not only in charge of patients who stayed at the hospital, but also of the poor who applied for cures. According to the vakfiye, the staff included two doctors, two ophthalmologists, one surgeon, one chemist, two nurses and two cooks. The vakfiye also described in detail the duties of each and determined their wages.

The Fatih darüşşifa suffered a damage and was repaired during the reign of Bayazıd II (1481-1512). (Ünver,

Fatih Darüŝŝifası, 12). In 1577 (A.H.985), in consideration of the needs of the patients, a bath was added to it through the efforts of the chief doctor Hacı Musa. After the great fire during Mahmud II's reign the tradesmen of the ironworkers' market settled in the darüŝŝifa. Mahmud II (1808-39) later prevented the demolition of the dilapidated building demanded by the Vakıflar Administration and a quarter of wooden houses and barracks was built over it. According to Ünver, a few cells of the darüŝŝifa could still be distinguished in 1909 (A.H.1324); in 1910 during the laying of the road the ruins and foundations were demolished leaving only a piece of the kible wall and the side wall of the mescit.(Ünver, Fatih Darüŝŝifası, 13.)

3. The Darüŝŝifa of Bayazıd II

The darüŝŝifa of Bayazıd II was erected as a part of a great külliye on the shore of the Tunca river in Edirne. In addition to the darüŝŝifa, the külliye consisted of a mosque, a medrese, an imaret, a hospice, a bakery and store.(Plate 28). Its construction was begun in 1484 and completed in 1488 by the Chief Architect of Bayazıd II, Mimar Hayreddin.(According to Ünver, a document in the archives of the Topkapı Palace dates the darüŝŝifa to 1486, Ünver, Edirne, 80.)

The darüŝŝifa consists of three attached sections; two traditional rectangular halls and an unusual hexagonal section which started a new phase in the plan scheme of Ottoman darüŝŝifas.(Plate 29).

The entrance from the south leads into the rectangular outer courtyard, possibly the service section of the hospital. Across is a colonnade (Plate 30) behind which are six cells each containing a rectangular window below and an arched one above, and a fireplace. The seventh cell at the right corner is a passage into the latrines, which in turn connects the darüşşifa to the medrese consisting of 18 cells and a domed classroom arranged around an arcaded courtyard with a şadırvan. This connection between the hospital and the medrese is a noteworthy aspect, and a proof of the mutual functioning of the two institutions. We have seen a similar design before in the Çifte Medrese built by the Seljuks. The six cells might have originally been planned for the personnel, but they later harboured the mental patients. (Şehsuvaroğlu, 261). To the right of the entrance are four more cells which were probably service rooms for the preparation of food and medicines. According to the vakfiye of the külliye of Bayazıd II in which the employees and their salaries were listed, those appointed to the darüşşifa included one head doctor and two doctors, two surgeons, two ophthalmologists, a pharmacist, five nurses, two cooks and a washer of the dead. Considering this list, it is quite likely that these rooms to the right of the entrance were used for the preparation of food and medicines for the patients and possibly as the laundry or for the washing of the dead. The three rooms to the right are domed each containing a lanterned oculus, whereas the smaller room on the left has a flat vaulted roof and does not

contain a fireplace; it might have been the porter's lodge. The darüşşifa also contained a private pharmacy which twice a week served as a clinic for out-patients and distributed free medicine to the poor.

To the left of the courtyard is the inner gate which opens into a smaller courtyard. The small vestibule of this gate is flanked on two sides by rectangular double-domed units. Each room contains two fireplaces and two windows, rectangular below and arched above. There are several suggestions with regard to the function of these halls; they might have been operating theaters, administrative rooms or dormitories (Goodwin, 150), or surgery and pharmacy and the patients' dining room (Kuran, The Mosque, 21), or wards for woman patients (Şehsuvaroğlu, Edirne, 261).

The inner section of the darüşşifa consists of a small rectangular courtyard surrounded by six square shaped rooms. Of the three to the right and similarly to the left, the central room opens into the court and has a doorway into the two other cells flanking it on two sides. All are domed and contain windows, all except the two iwan-like cells at the center are equipped with fireplaces. This was possibly the administrative section of the hospital.

Opposite the inner gate is another domed gate leading into the innermost section of the darüşşifa. This section consists of a hexagonal courtyard enclosed by rooms forming a larger hexagon. The court is sur-

mounted by a dome with an oculus and underneath which is a water basin. The drum of the central dome is equipped with 12 windows providing light into the hall. Twelve small domes covering the 12 cells below surround the central dome.(Plate 31). Of the 12, six are iwan-like cells opening into the court through arches. All except the entrance vestibule have doorways leading into the remaining six cells equipped with fireplaces and cupboard niches. The cell across the entrance vestibule has a pentagonal, domed extention. Some documents reveal that music was played for the patients and the mentally ill three times a week, which might have taken place on the platform of the main iwan.(Evliya Çelebi, 469). Kuran suggests that it might have been designed as a prayer iwan since it was directed toward the kible.(Kuran, The Mosque, 21).

Besides its unusual form, this section is the precursor of a new tradition with its plan scheme. Unlike the earlier Ottoman darüşşifas which followed the cross-axial scheme of the Seljuk medreses, an arrangement according to a centralized plan scheme is introduced by the darüşşifa of Bayazid II. In addition to the entrance and main iwans situated on the entrance axis, four more similar iwans are placed on the other two axes of the hexagon emphasizing the centralization.

In the traditional medrese plan scheme the main iwan, larger in size than the other cells, was placed on the entrance axis directly across the entrance iwan, while the other cells were arranged on the two sides of the axis. Thus, dominating the interior space with their ornate ar-

chitecture as well as their scale, the entrance and main iwans accentuated the longitudinal axis of the structure.

In the hexagonal form of the Bayazid darüşşifa, the centralization established by the uniformity of the cells surrounding the central court, and the tri-axial arrangement, is supplemented by the 12 small homogenous domes encircling the dominating central dome. This centralized plan scheme of the darüşşifa of Bayazid II was an innovation in Ottoman architecture which started a new tradition in the design of the classical Ottoman darüşşifas.

The darüşşifa must have originally been founded to shelter all types of patients including the mentally ill. It continued to function until the 19th century; it was greatly damaged in the Russian war of 1876, but was repaired and assigned to the mentally ill in 1894. (Şehsuvaroğlu, Edirne, 263). After the Balkan war the hospital went completely out of use. Though not in a very well-kept condition it is still intact and being used by the Edirne University.

Regarding its monumental architecture as well as intriguing features, the darüşşifa of Bayazid II is a unique example of Ottoman architecture.

4. The Darüŝŝifa of Hafsa Sultan

Sinan constructed his first hospital in Manisa in 1538-1539.(Plate 32). Kanuni Sultan Süleyman dedicated it to his mother Hafsa Sultan after her death in 1533; the inscription on it bears the date 1538-1539 (A.H.945). The darüŝŝifa was erected beside the complex of Hafsa Sultan consisting of a mosque, a medrese, an imaret, a hankâh, a bath and a primary school endowed by the Sultan in 1522 (A.H.929) and built before her death.

The state archives contain some information relating to the staff appointed to the darüŝŝifa and the inventory of medicines.(Konyalı, 56). The darüŝŝifa could accomodate 20 patients, and the staff included one head doctor, one surgeon, two ophthalmologists, one specialist for mental illnesses, two pharmacists, four nurses, two cooks and one laundryman. This shows that mental patients also received medical treatment in this hospital, and that there was a separate kitchen and a laundry for the patients.

The darüŝŝifa consists of the classical architectural elements; domed cells arranged around a courtyard and an octagonal water basin at the center.(Plate 33). An unusual feature is that there is no arcade around the courtyard.(Plate 34). Inside the entrance is a triple-domed space which opens into the courtyard through arches. At both sides of this space is a doorway through which entrance is effected into a rectangular hall.

Directly across the entrance is an iwan-like cell which, similarly, is entered through an arch, and which at either side has a doorway leading into the two rectangular cells flanking it. The remaining six cells of the darüşşifa are square in shape and smaller in size; each contains a window and niches some of which were possibly fireplaces and the others cupboard niches.

Despite the classical architectural elements, Sinan has not applied the traditional medrese plan scheme in the darüşşifa of Hafsa Sultan, though its arrangement is not centralized as in the case of Haseki. Sinan used different plan schemes in each of the four hospitals he constructed. The darüşşifa of Hafsa Sultan displays the intermingling of the medrese scheme inherited from the Seljuks and the centralized arrangement. (Plate 35).

5. The Darüşşifa of Süleymaniye

The darüşşifa built by Fatih in 1470 as a part of a great complex, was the only medical institution in Istanbul until the 16th century. During the reign of Kanuni (1520-1566), to meet the needs of a growing and developing city, a second extensive külliye including a tıb medrese and a darüşşifa was constructed in the area laid open by a fire which devastated the Eski Saray and its surrounding districts up to the Golden Horn and including Küçükpazar. The külliye of Kanuni Sultan Süleyman containing the darüşşifa was built by Sinan during the years 1550 and 1559 (A.H.957-966), and consisted of a mosque,

the türbes of Kanuni and Hürrem Sultan, medreses, dar ül-kurra, primary school, imaret, hospice, caravanserai, bath, library and shops.(Plate 36).

According to the documents available all kinds of patients not excluding the poor were accepted into the darüŝŝifa, the out-patients also received treatment, and there was a separate section for the mentally ill.(Ünver, Süleymaniye, 199). In the vakfiye of the Süleymaniye külliye established in 1557, the staff appointed to the darüŝŝifa was listed and their duties written in detail. The staff included: one head doctor and two doctors, two surgeons, two eye specialists, one chemist, one assistant chemist, one superintendent of medicines, two cooks and one hairdresser and bath attendant. The documents state that some head doctors of the darüŝŝifa have also taught in the tib medrese, which demonstrates that the darüŝŝifa and the medrese can be considered as the practical and theoretical parts of a medical school.(Plate 37).

The darüŝŝifa of Süleymaniye consists of two attached rectangular sections each arranged around an oblong courtyard, forming an outer and an inner court.(Plate 38). The entrance is at the center of the southern façade, a blind wall facing a narrow street and the tib medrese across. (Plates 39,40). The entrance door leads into the outer court surrounded by a domed portico.(Plate 41). On the eastern and western sides of the court are three small, double-domed halls, two on the left and one on the right. There is also a single-domed cell on the right corner.

These rooms behind the portico forming the outer section of the darüşşifa was possibly the administrative department. It is likely that one was the kitchen for the preparation of food and medicines for the patients, considering that two cooks and one chemist were listed on the staff of the hospital. Beyond these halls, on both sides are vaulted, narrow passages leading into the outer gardens. The smaller garden on the eastern side is now closed and lavatories have been built. At the back, attached to the cells of the hospital, is a double domed hall containing two fireplaces, which is now used as the laundry. This hall or the small attached section at the north western corner was probably the bath, since the darüşşifa contained a separate bath apart from that of the külliye. (Ünver, Süleymaniye, 205). Across the main entrance, on the north side of the outer court is an inner doorway opening into the second court. (Plate 42). At the center is a pool with a fountain. The rectangular courtyard is framed by a domed portico, the units of which are larger than those in the outer court. Behind the portico, on the northern, eastern and western sides are 16 domed cells for the patients. Close to the center of the western arm is a narrow, vaulted passage leading into the garden. (Plate 43). On the eastern side is another narrow unit balancing the other which is walled up now but was probably a passage opening into the eastern garden. The cells of the patients are about the same size each, and contrary to tradition, the darüşşifa does not have an evident classroom. On the second floor of the dar-

üşşifa lined along a corridor were 12 rooms occupied by the medical students.(Gürkan, Süleymaniye, 264). Each room contained a window that opened out to the street.

The darüşşifa is built on a high rampart; on the northern side below are two stories of rooms looking on- to the street.(Plate 44). The first floor might have been a part of the caravanserai (Ünver, Süleymaniye, 205), or a place where the insane were kept as Goodwin suggests (Goodwin, 219), access to which was gained by a stairway from the outer court of the hospital, while those on the street level were probably the stables of the caravanserai or more possibly shops.

6. The Darüşşifa of Haseki

Sinan's first work in Istanbul was the complex of Haseki Hürrem Sultan, endowed by Kanuni's wife Hürrem Sultan. The külliye consisted of a mosque, a medrese, a primary school, an imaret and a darüşşifa.(Plate 45). All parts of the complex except the imaret were built by Sinan; the imaret of Haseki Hürrem Sultan however, is not mentioned among the works of Sinan.(Kuran, Haseki, 64). The mosque, the medrese and the primary school were all constructed at the same time in the years 1538-1539 (A.H.945-946); the imaret bears an inscription dating to 1550 (A.H.957) and states that it was built by Kanuni Sultan Süleyman. The inscription of the darüşşifa shows the date of 1539 as its construction date; it is not the original inscription but was put up during the restoration

in 1911.(Kuran, Haseki, 68).

An aspect worthy of notice is the general, irregular shape and arrangement of the darüŝŝifa and the inconsistency between the parts of the külliye, which we do not observe even in some earlier Ottoman complexes such as the Bayazıd II and the Fatih külliyes. The haphazard arrangement of the early Ottoman külliyes are later replaced by geometrically organized complexes of structures. Although all of the complex except the imaret was built by Sinan, there is no axial relationship between the units. The arrangement of the darüŝŝifa within itself is also irregular, which can be explained by the restrictions of the construction area. Since the darüŝŝifa does not contain an original inscription, Kuran's theory that the darüŝŝifa was built after the other parts of the complex, between the years 1550 and 1557, provides the most rational clarification to the confusing arrangement of the parts and of the plan of the hospital.(Kuran, Haseki, 64).

The darüŝŝifa of Haseki Hürrem Sultan is an unusual example in that it does not follow the traditional architectural style. Its plan is not the typical medrese scheme; the arrangement of the units is according to a centralized plan scheme.(Plate 46). The central unit is an octagonal courtyard, an unusual form, and the cells are grouped around the courtyard. The darüŝŝifa consists of two symmetrical parts; two large, square iwans located at the two smaller sides of the octagon form the centers

of these two identical sections. Access to the cells is gained from the iwans which open through large arches into the central courtyard.(Plate 47). The arcade, a traditional element of the classical medreses and darüŝŝifas, is non-existent here. Each cell, formed of square domed units, contains a fireplace and a grilled window opening outside. The iwans are also covered with domes supported by three small half domes. Opposite the iwans on one side is the entrance vestibule.(Plate 48). On the other side is an irregular shaped unit which possibly contained the lavatories. Between the entrance vestibule and the lavatories there is a high wall facing the street (Plate 49), containing two rectangular, grilled windows inserted in pointed-arched niches and a blind niche in between.(Plate 50). All of the lower windows are grilled and rectangular, and are crowned by marble blind arches, while the upper windows are arched and screened by stucco lattice-work.(Plate 51).

The vaulted rooms attached to the back wall of the darüŝŝifa might have been designed as the service section or the storerooms.(Kuran, Haseki, 62). The darüŝŝifa contained latrines, but it seems that there is no suitable place for the service units inside the darüŝŝifa; thus it is likely that the attached units were designed for this purpose.

The darüŝŝifa was constructed of regular blocks of cut stone. The structure is very plain and does not contain any ornamentation besides the architectural deco-

rative elements such as the stalactites on the pendentives and the arches over the windows.

According to the vakfiye, the staff consisted of a head doctor and a doctor, two eye specialists, two surgeons and two pharmacists, and the hospital was open to all kinds of patients, though in the 19th century it was assigned to women. The hospital of Haseki is still functioning in the administrative building in Haseki, where it was moved in 1884.(Güreşsever, 103). The original darüşşifa building, employed until recently as a children's clinic and a clinic for internal diseases still preserves its original form. The unusual design, together with Sinan's success in the use of space and the arrangement of the cells which form a compact whole, make the darüşşifa of Haseki Hürrem Sultan a unique example of the Ottoman health institutions.

7. The Darüşşifa of Atik Valide

The third great külliye of Sinan which included a hospital was that of Nurbanu Valide Sultan, also called the Atik Valide Sultan, founded by Murat III's mother Nurbanu Sultan, and constructed in 1582 (A.H.990) in Toptaşı, Üsküdar. The külliye included a mosque, a medrese, a dar ül-kurra, a dar ül-hadis, a primary school, a hankâh, an imaret and a darüşşifa.(Plate 52).

It is difficult to discern the original features of the darüşşifa since it has gone through several changes at various times.(Kuran, Atik Valide, 233). During the

reign of Mahmud II in the 19th century, the building was turned into a barracks, the domed roof was removed and a second story was added. Later, in the 20th century more changes were effected when it was converted into a tobacco treatment store. In 1976 the workshop was moved elsewhere and now the darüŝŝifa building together with the imaret houses the İmam Hatip school.

The darüŝŝifa, attached to the northern wall of the imaret (Plate 53), was originally a single-storied, domed structure constructed of stone. As it is stated in the vakfiye and as far as the original stone structure of the wall can be seen, it had high exterior walls.(Plate 54). Despite the appearance of the building its plan scheme had been preserved. It was built on the typical medrese scheme of cells and an arcade arranged around an open rectangular courtyard, although it displays the Ottoman interpretation of the Seljuk medrese scheme which is a blend of the longitudinal arrangement of the courtyard and the cells and the centralized plan scheme.(Plate 55). Thus, the darüŝŝifa of Nurbanu Valide Sultan has a centralized medrese scheme instead of the classical cross-axial four-iwan scheme. As a whole, the building is compact and shows a regular arrangement, although there are cells of different shapes and sizes. The upper structure and the interior of the rooms have also gone through changes. Through one of the cells there is a doorway opening into the imaret, but originally there was no passage between the two buildings; the darüŝŝifa was an independent struc-

ture. According to the vakfiye dating to 1582-3 (A.H. 990), the staff included an imam, two muezzins, a stoker, two cooks, a butler and a laundryman, which shows that as we have seen in the previous Ottoman darüşşifas, in spite of being a part of a complex, the darüşşifa was a self-sufficient institution containing its own mescit, kitchen, laundry and bath to meet the needs of the patients. (Kuran, Atik Valide, 234). An important feature of the darüşşifa of Nurbanu Valide Sultan, like the other Ottoman health institutions, is that it was a component of a social complex.

8. The darüşşifa of Sultan Ahmet

The only medical institution that is known to have been built in the 17th century was the darüşşifa of Sultan Ahmet. It was constructed in 1616 as a part of the great külliye by the architect Mehmed Ağa. (Plate 56). The vakfiye of the darüşşifa, written in 1612 (A.H. 1022) before the building was constructed, as well as the observations of Evliya Çelebi provide information about the functioning of the hospital. According to Evliya Çelebi, generally the poor and the insane were brought to this hospital, and the patients were always treated kindly. (Evliya, I, 52). In 1870's during the construction of the art school the cells and arcades of the darüşşifa were demolished, but the foundation walls and the lower parts of the outer walls remained over which the new building was erected. The entrance door and the small bath flanking it were not

destroyed.(Nayır, 85).

The plan scheme of the darüŝŝifa consisted of domed cells and arcades arranged around a square courtyard.(Plate 57). There were 26 cells and each, except those flanking the bath on the northern side contained a window looking outside, and all contained another opening beside the doorway and a niche inside which was possibly a fireplace. The cells on the corners had two windows each. At the center of the western side was the narrow rectangular entrance vestibule, and directly across it on the same axis was a narrow cell balancing it. There was a recess at the north-eastern corner of the building where two cells were missing. This was due to the shape of the land; the darüŝŝifa was built on the edge of a steep slope.(Plate 58).

At the northern side attached to the darüŝŝifa and entered through one of the cells is a small bath displaying the emphasis placed on cleanliness.(Plate 59). It consists of a small dressing room and two halvets. This unusual design of a passage through a cell into the bath, according to Nayır, must have been conceived to make access easier for the patients.(Nayır, 85).

In the construction of the new, two-storied school building, the plan scheme of the darüŝŝifa consisting of cells, arcades and the square courtyard has been preserved.(Plate 60). Four columns of the arcade in front of the vestibules on the eastern and western sides have stalactite capitals which possibly survived

from the darüŝŝifa.

The plan of the Sultan Ahmet darüŝŝifa which does not exist today displays the typical medrese scheme. Similar to Süleymaniye, the Sultan Ahmet darüŝŝifa also does not possess an evident classroom. The iwans characteristic of Seljuk and early Ottoman darüŝŝifas are no longer seen in these later examples.

IV. ANALYSIS

In order to understand the architectural development of the Ottoman darüşşifas, I think it is necessary to make a general analysis of the Seljuk şifaiyes which form the origin and are the predecessors of the Ottoman darüşşifas.

Considering their general architectural characteristics, the Seljuk şifaiyes follow the classical medrese plan scheme. Like the Seljuk medreses the şifaiyes also developed open and enclosed types, but generally both types consisted of similar elements and showed similar arrangements. In the typical plan scheme, the most prominent element of the structure is an interior courtyard around which the other units of the building are arranged. The courtyard is usually framed by a portico and contains a water basin at the center. Another outstanding element of the Seljuk şifaiye is the iwan. The structure is designed on an axial or cross-axial scheme and the most important elements are placed on these axes emphasizing the axial arrangement. These elements are the portal and the entrance vestibule and the iwans which at the same time are the most noticeable features in regard to their size and decorations, since the structure as a whole is extremely plain. The number of iwans vary from one to four depending on the size of the building; the şifaiye of Amber bin Abdullah in Amasya contains two iwans, the şifaiye of Turan Melik Sultan contains three, and the monumental Çifte Medrese

at Kayseri is planned on a four-iwan scheme.

Similar to Seljuk medreses the şifaiyes also contained enclosed spaces located at the sides of the iwans. These were generally the common areas which were grouped at the two ends of the main axis; around the entrance vestibule and the main iwan across.

Another important element in some Seljuk şifaiyes is the mausoleum of the founder. It is either located on an axis, in place of a side iwan as in the şifaiye of Keykâvus in Sivas, or attached to the main iwan as in the Turan Melik Sultan in Divriği, and traditionally is surmounted by a dome inside under a conical cap.

The arrangement of the building is usually longitudinal and around a rectangular courtyard to provide more space for the cells. The cells of the patients are arranged between the iwans, generally on the two longer sides of the courtyard. They are either square or rectangular and sometimes contain cupboard niches and fireplaces. They open into the central courtyard through the arcades and ventilation and light are provided through their doors. They either do not have windows opening outside in order to keep the privacy of the interior, or they are furnished with small windows designed in such a way that the interior could not be seen from the outside.

Traditionally, the upper structure of the Seljuk şifaiyes is usually the vault. Both the iwans and the cells, whether they are rectangular or square in shape,

are surmounted by vaults of different shapes, but usually barrel vaults.

The water motif at the center of the interior courtyard is commonly used in the Seljuk şifaiyes as in the medreses. The courtyard generally contains a pool which met the water demand of the hospital. In cases when the building is enclosed, such as the Turan Melik Sultan, the central dome or vault contains an opening and the pool is placed right under this opening.

The most outstanding feature of the şifaiyes like the medreses is the richly decorated monumental portal which is generally placed on the central axis emphasizing it, though sometimes at a side as in the şifaiye of Gevher Nesibe. The portal higher than the building and richly ornamented, crowns the building.

In contrast to the plain architecture, the Seljuk structures are characterized by their florid decorations of carved stone. All of the exterior decoration is focused on the crowning portal. Reliefs and symbolic motifs are frequently used on the entrance façade. Mosaic decorations and tiles are also used in the interior.

The Seljuk şifaiyes usually contained a classroom where medical lectures were given; they were sometimes erected beside the medreses, which explains that a şifaiye was not only a place where medical treatment was given, it was at the same time an educational institution for the students of medicine who could have practical training.

The Çifte Medrese at Kayseri is a very good example which displays this application.

Considering their general features the Ottoman darüşşifas display similar characteristics to the Seljuk şifaiyes; in a sense they are a continuation of the Seljuk hospital architecture. This similarity is reasonable if one takes into consideration the fact that the Seljuk şifaiyes continued to be used by the Ottomans. In general, the Ottoman darüşşifa consists of similar architectural elements and organization; the cells arranged around a central courtyard. The earliest Ottoman health institution, the darüşşifa of Yıldırım at Bursa, follows the classical Seljuk şifaiye plan scheme. The axial arrangement of the longitudinal courtyard with the arcades and cells on both sides is typical of Seljuk şifaiyes. The entrance vestibule and the large room across it emphasize the axuality. Despite this similarity in the general plan scheme, Ottoman darüşşifas do not contain the iwans placed on the axes of the Seljuk şifaiyes. The main iwan gives way to the enclosed, domed classroom as in the darüşşifas of Yıldırım and Fatih.

The latter Ottoman darüşşifas, besides following the traditional medrese scheme, developed a different plan scheme. The hexagonal section of the darüşşifa at Edirne is a messenger of this new development; the organization of its cells is based on a centralized plan scheme. The plan scheme of Haseki also displays the centralization; it is remote from the classical Seljuk arrangement. The other Ottoman darüşşifas, Hafsa Sultan, Süleymaniye, Atik

Valide and Sultan Ahmet demonstrate a different interpretation of the medrese plan scheme; the arrangement of the units is centralized rather than axial. In Hafsa Sultan, the cell with an arched opening across the entrance gives the sense of an axial, two-iwan scheme, whereas in the other three there is no evident classroom marking the axiality we saw in the earlier hospitals. An untraditional feature of the Hafsa Sultan and Haseki is that there is no arcade surrounding the courtyard.

The water motif at the center of the interior courtyard is also used commonly in the Ottoman darüşşifas. The darüşşifas of Bayazid II, Hafsa Sultan and Süleymaniye contain a water basin in their courtyards. The pool under the oculus of the central dome in the hexagonal hall of Bayazid II is a typical arrangement.

The cells of the patients surrounding the courtyard do not show great differences except that their upper structure is no longer a vault but a dome, and that they contain windows opening outside. Ottoman architecture, compared with Seljuk, has more and larger openings due to technical possibilities and in consequence is more illuminated. Cupboard niches and fireplaces are also common features.

A novelty introduced by Ottoman architecture is the regularly arranged composition of a complex of buildings. This novelty was initiated after the conquest of Istanbul in the latter half of the 15th century. Neither in Seljuk nor in early Ottoman architecture do we see the

geometrical organization of the units of a complex.

In Seljuk architecture there are small complexes consisting of a few buildings such as the şifaiye of Turan Melik at Divriği, which was built adjacent to the Great Mosque and also had a separate bath. The şifaiye of Gevher Nesibe on the other hand, is flanked by a medrese. There is a passage in between the two structures, the şifaiye and the medrese, which shows that they were designed together for a mutual purpose. These are the earliest prototypes of a complex of structures planned together. In spite of these examples, Seljuk architecture constitutes mostly independent structures. Even when they are designed as a part of a complex, the structures are usually built independently, without much concern for the spatial relationship between them. The şifaiyes of the Seljuks also, unlike the ones I have mentioned above, were independent structures.

The Ottoman darüşşifas, dissimilarly, form a part of a complex. An aspect we do not observe in Seljuk architecture and which develops during the Ottoman era is the organization of buildings with concern for town planning. The concept of a külliye forming the social center of a community was introduced by the Ottomans. The geometrical arrangement of spaces within the külliye, however, is absent in the early Ottoman complexes. The separate buildings of the külliye of Yıldırım Bayazıd in Bursa, for instance, are haphazardly located; there is no axial relationship between the units.

The earliest complex constructed on an organized geometrical scheme was the külliye erected by Mehmet the Conqueror in 1470. The medreses, the hospice and caravanserai, the türbes and the darüüşşifa were arranged in an architectural composition encircling the mosque. This schematic order initiated by the Fatih complex was succeeded by the külliyes of Bayazıd II at Edirne (1488), and later of Süleymaniye (1557). All three display a meticulous and a more conscious architectural composition peculiar to classical Ottoman architecture.

In addition to the geometrical and axial arrangement of the components, a noteworthy aspect introduced by Sinan is the third dimension. We observe this novelty in the darüüşşifa, imaret and hospice of Süleymaniye which were erected on a slope, and later in the complex of Atik Valide which was built on four levels; the hospital being located together with the imaret and hospice on the third level. In very early Ottoman architecture we see another example, the darüüşşifa of Yıldırım Bayazıd, situated on a slope. The considerable difference between it and the darüüşşifa of Süleymaniye is that the latter was given a third dimension by the stories added under it on the lower side of the hill, while the former was just horizontally adjusted to the slope of the land, thus being only two dimensional.

Among those I have been analyzing, the complex including the darüüşşifa of Haseki displays a composition which is somewhat confusing since it has an irregular ar-

rangement. The plan of the darüŝŝifa itself is also unusual; the northern side of the octagonal courtyard forms the exterior wall facing the street, and between this wall and the cells are awkward-shaped rooms giving a sense that the building was interrupted by the street. A logical explanation is that the darüŝŝifa was constructed after the other units of the complex; it had to be inserted into the remaining piece of land and was shaped in accordance with the street.

Regarding their plans, the Ottoman darüŝŝifas have a more compact and orderly architectural form compared with the Seljuk ŝifaiyes. The rooms with regard to their shapes and sizes are more homogenous and their arrangement more symmetrical. The regular arrangement of the spaces and the compact mass are the result of a more conscious design concept.

Contrary to the plain mass but abundant decorations of Seljuk architecture, Ottoman architecture is less decorative, yet has more complex architectural features. The Ottoman darüŝŝifas, besides the architectural decorative elements, do not have much ornamentation and have very plain and modest exteriors possibly due to their functions and the need for privacy.

Seljuk ŝifaiyes were constructed of rubble or cut stone which were the local building materials of the Anatolian Seljuks. Brick was employed in some places as a secondary building material and mostly as a decorative element on the interior walls. The upper structure, the

vaults covering the cells and the iwans were sometimes built of bricks. The Ottoman darüŝŝifas were also constructed of rubble or cut stone; horizontal rows of bricks were used in some places.

The courtyard is an important element of Seljuk architecture. The types of structures which house people such as the hospitals, medreses and caravanserais, are all arranged around an interior courtyard. This arrangement is due to the introverted life style of the Seljuks and is thus reflected in their architecture; the courtyard emphasizes the interiority. Due to the same reasons, the mosaic decorations and tiles in the interior, as well as the monumental portal which is accentuated on the exterior with its abundant decorations and its size, creating the image of pulling one into the interior, also emphasize the interior. The interior is totally sealed in since the walls have very small or sometimes no openings. On the other hand, the exterior is a heavy, massive block sheltering the interior from the outer world. Plain and rigid outer walls and flat roofs do not reflect the interior.

Since the Ottoman life style was not extroverted either, similar types of buildings, especially those such as the hospitals which required privacy, continued to be arranged in the same manner as in the Seljuk architecture. The courtyard remained the most prominent element of the structure.

Another peculiarity of the courtyard is that it was the main factor in establishing the size of the build-

ing, giving it its scale. The longitudinal arrangement of the courtyard and the surrounding spaces provide a flexibility relating to the size of the structure. Also the linear arrangement together with the horizontal effect formed by the repetition of the colonnades and arches, the longitudinal axis emphasized by such dominating elements as the portal, the main iwan, the mihrab niche and the pool at the center give the interior space a depth.

In Ottoman architecture, with the domination of the central dome over the interior space in the mosque a development towards centralization begins, and a parallel development takes place also in the medreses and hospitals. The dome covering the central space is surrounded with smaller domes and half domes which cover the subsidiary spaces grouped around the center forming a hierarchical arrangement, thus the all-embracing dome becomes the dominating element and a unity of space is achieved.

This development in Ottoman architecture is similar to that in European architecture. Although the sources of approach are different we see a parallel development in the architecture of the Renaissance era. Though the Renaissance architects were influenced by the centralized Byzantine churches, with a new approach towards life and religion the centralized space concept became the principal feature in the design of many religious buildings. In the basilical church, the longitu-

dinal form and the interior architectural elements such as the vaulted roof, the colonnades and arches on the sides form an axis that leads the person towards the altar in the apse. This was the main function of the longitudinal form of the basilical plan, since the church urged man to seek salvation in heaven rather than on earth.(Copplestone, 169). With the introduction of Renaissance a more humanistic point of view developed; the human proportions were taken into consideration and even became the most prominent idea behind the architectural design. The simplest geometrical forms were considered the most perfect; since the simple centralized space created a radial effect and an image of grouping around the center, it was thought to symbolize the perfection of God.(Murray, 53).

In addition to the centralization, symmetrical planning and carefully proportioned spaces were also characteristic of the Ottoman architecture especially during the Sinan era. The radial arrangement of elements around and under the dominating dome also has a religious significance. The focusing of equal sections on to a central point as well as the vertical image created by this arrangement may be symbolic of the perfection of God.

Besides creating an impressive interior space the centralized arrangement also provided the possibility to evolve a larger space from a simple form without spoiling the unity of space.

The Ottoman medrese and hospital architecture followed the traditional plan-scheme and without much al-

teration in the elements formed a centralized organization of spaces. The most prominent element of the centralized arrangement, the dome, which covers the central space in the closed Seljuk medreses, does not exist in the open-court medreses and hospitals. Centralization is created by the exclusion of the iwans which indicated the axes and gave a longitudinal direction to the interior space, and by giving the surrounding spaces a uniform characteristic and thus forming a radial effect. The water basin which was a traditional element always conceived together with the dome with an oculus surmounting it still preserves its place at the center of the courtyard perhaps creating the image of a dome and accentuating the centrality of the space.

Since the Seljuk hospitals were independent structures instead of being a part of a complex, it is very probable that they contained a kitchen of their own providing the food required for the patients and for the personnel, and a bath for the cleaning of the patients. Unless the vakfiyes of the Seljuk hospitals are found, it is difficult to specify the function of each space.

The Ottoman darüşşifas, on the other hand, were instituted as a part of a complex which almost always included an imaret and usually a bath. Among those I've been analyzing all contain an imaret, and those which contain a bath are: the complexes of Yıldırım, Fatih, Hafsa Sultan, Süleymaniye, Atik Valide and Sultan Ahmet. It is likely that a bath has not been included in the design of the complex of Haseki which possibly was not

planned as a whole and constructed at the same time. The essential parts of a külliye are the mosque, medrese and imaret, and other structures such as the bath, caravanserai and shops were additionally built to bring income to the vakıf. Despite the fact that the darüşşifas in these complexes were built together with an imaret and a bath, I think they had a kitchen and a bath of their own providing service only to their patients. The vakfiyes listed among the staff cooks, which is proof that the hospitals contained private kitchens. In the vakfiyes of Süleymaniye and Atik Valide are also listed a bath attendant among the staff of the darüşşifa which shows the existence of a bath, and the darüşşifa of Sultan Ahmet included a private bath which still exists. The hospital in the women's court in the Topkapı Palace also included a private kitchen and a bath to meet the requirements of the patients.

The Seljuk and Ottoman hospitals display a parallel development to that of medreses and architecturally they are indistinguishable from them. In regard to their similarity it is possible to claim that the şifaiyes emerged from the same source as the medreses.

According to Godard, the four-iwan scheme of medreses originated from the Khorasan houses of the 10th century.(Godard, 1-9). Creswell, on the other hand, claims that the cross-axial scheme of Cairene houses formed the origin of the medreses.(Creswell, Muslim, 129). He states that at first, the professors gave their lec-

tures in their homes which later influenced the architectural features of the medreses. We know that one of the earliest hospitals was established in Ebu Zubeid's house in Cairo during the Umayyads. (Terzioğlu, Ortaçağ, 128). This shows that the application and practice of medical science was, like the teaching of various sciences, conducted in the houses prior to the establishment of institutionalized hospitals and medreses. The architectural characteristics of the houses of professors where the lectures were given have possibly influenced the development of medreses. The four-iwan scheme as well as the arrangement of the enclosed medrese must have originated from the Central Asian houses.

The plan scheme of the Buddhist viharas which display an arrangement of cells around a central courtyard is also typical of the Seljuk-open type medreses and hospitals. (Kuran, Anadolu, 9). Considering, as I have mentioned before, that medical training and treatment were applied in the Buddhist monasteries, and that these monasteries displayed the four-iwan scheme arranged around a courtyard, it is reasonable to accept the theory that this scheme widely applied by the Seljuks in the design of the hospitals and the medreses took its source from these monasteries.

Although documents extant reveal that medicine was among the sciences that were taught in the medreses, we know that the hospital was at the same time a place of practical training for the students of medicine as

well as a shelter for the sick. It usually contained a classroom for the lectures or was sometimes constructed beside a medrese. I have mentioned before that in the maristan of Sultan Kalaun in Cairo a special place was allotted for the head physician to deliver a medical lecture. The darüŝŝifas of Yıldırım in Bursa and Fatih erected by the Ottomans contained classrooms where medical lectures were given and practical training was conducted. On the other hand, in the ŝifaiye-medrese of Gevher Nesibe built by the Seljuks, consisting of two identical buildings attached to each other and joined through a corridor, medical training and the treatment of diseases were conducted simultaneously. Similarly, the darüŝŝifa of Bayazıd II attached to the medrese flanking it was joined to it through a corridor. Thus being closely related to the medical schools, and also because their architectural features were suitable, the hospitals showed a parallel development with the medreses.

This plan scheme was also utilized because of its suitability to the function of the structure. The arrangement of the wards around an interior courtyard where surveillance was conducted, provided the privacy of the interior required by the introverted character of the hospital. In order to protect the privacy, the wards were equipped with no windows or very small windows above the head level in the early hospitals, and in the Ottoman hospitals the windows were arranged so that the interior could not be seen from outside. The needs of the patients

for light and ventilation were supplied from the courtyard; the wards usually had windows opening into the courtyard. Thus all the activity of the hospital took place in the enclosed courtyard which, with the wards opening on to it, was closed to the outside.

Considering their general architectural characteristics, we may conclude that the Ottoman health institutions follow the Seljuk tradition, yet at the same time they develop a style peculiar to themselves.

V. CONCLUSION

Ottoman darüşşifas which occupy an important place in Ottoman architecture but have not been a subject of expansive research display a development beginning with the earliest civilizations and the intermingling of various cultural effects. Both from the administrative and architectural points of view, Ottoman darüşşifas possess many similarities to the Seljuk and early Islamic, and even the pre-Islamic hospitals as far as we can obtain information from the written documents, since many of these early structures do not remain.

We can trace the origin of the plan scheme of Ottoman darüşşifas to Syria, Iran, especially Khorasan, and Central Asia, where we find the origin of medreses, as these two structures display a parallel architectural development. The darüşşifa and medrese were closely related to each other, since in a way, both were assigned to the teaching of medical science; the latter being a place of theoretical training while the former was for the practice and application of treatment methods.

Regarding their architectural features, Ottoman darüşşifas possess similar characteristics to the Seljuk şifaiyes; we can state that Ottoman hospital architecture is the continuation of Seljuk hospital architecture. From the point of view of the plan scheme and arrangement of spaces we see the continuation of the Seljuk tradition. The architectural elements in both consist of cells of the patients and other rooms allotted to other purposes group-

ed around a courtyard containing a şadırvan.

An outstanding element of the Seljuk şifaiyes is the iwan which is placed on the main axis and sometimes also on the perpendicular axis. Şifaiyes were built on an axial or cross-axial scheme and the iwans emphasized this axial arrangement.

The four-iwan scheme descended from the pre-Seljuk period was abandoned during the Ottoman era. The earliest Ottoman hospitals, the darüşşifa of Yıldırım at Bursa and of Fatih in Istanbul followed the traditional axial scheme, though later this scheme was replaced by the centralized scheme. This novelty did not cause much variation in the architectural elements or the general arrangement of the cells around a courtyard. The iwan, which accentuated the axiality in the Seljuk şifaiyes, was either not used at all, or was reduced to the same size as the other cells so it was no longer the most prominent element of the interior space. In the darüşşifas of Süleymaniye, Atik Valide and Sultan Ahmet there is no iwan, whereas the iwans in the hexagonal part of Bayazıd II and in Hafsa Sultan possess the same characteristics as the other cells.

In addition to this major difference in the plan scheme, we can generally define the Ottoman darüşşifas as compact and orderly, but modest and plain structures with regard to their decorations and the exterior façades.

The Ottoman darüşşifa is not an independent structure, but forms a part of a complex. With the development of the concept of town planning, the darüşşifa together

with the other institutions of the complex took its place in the social center of the town and was located so as to form a geometrically and axially arranged composition.

An important feature of the darüşşifas was that they were endowed establishments. All their expenses including the wages of the staff were paid out of the vakıf income, and the patients could receive medical treatment free of charge. Being a charitable institution, the darüşşifa not only offered medical service to the in-patients, but also accepted out-patients and distributed free medicine to the poor.

The Ottomans continued to use the hospitals built by the Seljuks, while erecting a new one in each town they settled. As the population of Istanbul grew several more hospitals had to be erected to meet the needs. Besides other charitable institutions like imarets, hospices and baths, hospitals built by the Ottomans demonstrate the importance placed on the welfare of the people.

Unlike the contemporary health institutions in Europe which provided only shelter to the sick, Ottoman darüşşifas were staffed with physicians who, while providing practical training to the students of medicine, also devoted themselves to the cure of the sick. The advanced medical science of the Turks as well as of the other Islamic countries had much influence on the development of western medical science. Western health institutions, in regard to their architectural features and their administrations, must as well have been influenced by those

established in the Islamic countries. In the 18th century, however, Ottoman medical science started to feel the effects of the West. Like Ottoman architecture after the 17th century, hospital architecture of the latter centuries embody the influences of westernization. Those erected until the 17th century, which are still intact, on the other hand, are the unique examples of the early and classical period hospitals built in the individual style of Ottoman architecture.

GLOSSARY

Acemiođlan	cadet; a conscript boy selected and brought up to join the Janissaries
Bab-ı Hûmayun	imperial gate; main entrance to the palace
Dâr ü-l-hadîs	college where the traditions of Islam are taught
Dâr ü-l-kurra	Koranic school
Enderun	inner section of the palace
Halvet	cubicle; single room in a public bath
Hankâh	dervish convent
Has Oda	royal ward
Hazine	treasury
İçođlan	page in the palace
İmaret	hospice; later a public soup kitchen for the poor
Iwan	a vaulted or domed recess open on one side
Kible	the direction of Mecca and therefore of pray
Küllîye	a complex of buildings of an institution
Kümbet	mausoleum
Mescit	small mosque
Mihrab	niche indicating the direction of Mecca
Müezzin	mosque officer responsible for the call to prayer
Şadırvan	fountain for ritual ablutions before prayer
Tekke	dervish convent
Timarhane	hospital
Türbe	mausoleum
Vakfiye	deed of trust of a pious foundation
Vakıf	endowed establishment
Vihara	Buddhist monastery

BIBLIOGRAPHY

- Adıvar, A. Adnan, "İstanbul'un Fethi Sırasında Bizans ve Türk Kültür Vaziyeti," Tarih Dergisi, Vol. VI, No. 9, İstanbul, 1954.
- Osmanlı Türklerinde İlim, İstanbul, 1943.
- Afetinan, A., "Kayseri'de Gevher Nesibe Şifaiyesi," Malazgirt Armağanı, No. 4, Ankara, T.T.K. Yayınları, 1972
- "Kayseri'nin 749 Yıllık Şifaiye Tıp Medresesi," Belleten, Vol. 20, No. 78, Ankara, 1956, 217-22.
- Mimar Koca Sinan, Ankara, 1968.
- Akar, Fikriye, "XV-XVIII. yy.da İstanbul'daki Sağlık Müesseseleri," M.A. Thesis, İstanbul University, 1970.
- Akşit, İlhan, Ancient Civilizations of Anatolia and Historical Treasures of Turkey, İstanbul, 1982.
- Altıntaş, Özkan, "Osmanlı Darüşşifaları," M.A. Thesis, İstanbul University, 1973.
- Altun, Ara, Mardin'de Türk Devri Mimarisi, İstanbul, 1971.
- Arık, Oluş, "Başlangıç Devri Anadolu Türk Mimari Tezyinatını Karakteri," Malazgirt Armağanı, No. 4, Ankara, T.T.K. Yayınları, 1972, 173-77.
- Arseven, Celal Esad, Türk Sanatı Tarihi, İstanbul, n.d.
- Aslanapa, Oktay, Edirne'de Osmanlı Devri Abideleri, İstanbul 1949.
- Osmanlı Devri Mimarisi, İstanbul, 1986.
- Turkish Art and Architecture, London, 1971.
- Atiya, Aziz Z., Crusade, Commerce and Culture, Bloomington, 1962.
- Atasoy, Nurhan, İbrahim Paşa Sarayı, İstanbul, 1972.
- Ayverdi, Ekrem Hakkı, Fatih Devri Mimarisi, İstanbul, 1953.
- Osmanlı Mimarisinde Fatih Devri (1451-81), İstanbul 1973.

- Osmanlı Mimarisinin İlk Devri (1230-1402), İstanbul, 1966.
- Bakırer, Ömür, Selçuklu Öncesi ve Selçuklu Dönemi Anadolu Mimarisinde Tuğla Kullanımı, Ankara, 1981.
- Baki, Edib Ali, Karacaahmet ve Delileri Tedavi Yurdu, İstanbul, İ.Ü. Tıp Tarihi Enstitüsü, 1947.
- Balducci, Hermes, Rodos'ta Türk Mimarisi, trans. Celalettin Rodoslu, Ankara, 1945.
- Baltacı, Cahid, XV-XVI. Asırlarda Osmanlı Medreseleri, İstanbul, 1976.
- Barkın, Rebi, "Halep'deki Ergun Muristanı Hakkında," Türk Tıp Tarihi Arkivi, Vol. 4, No. 15, İstanbul, 1940, 135-41.
- Bayat, Ali Haydar, Sivas Tıp Sitesi (1217), Bornova, 1967.
- Bayattekin, Osman, Eski Bergama'da Asklepiyon (Sağlık Yurdu) İstanbul, 1935.
- Baykal, İsmail, "Yeni Sarayda Enderun Hastahanesi," Türk Tıp Tarihi Arkivi, Vol. 5, No. 17, İstanbul, 1940, 33-41.
- Bolak, Orhan, Hastanelerimiz: Eski Zamanlardan Bugüne Kadar Yapılan Hastanelerimizin Tarihi ve Mimari Etüdü, İstanbul, 1950.
- Cantay (Güreşsever), Gönül, "Anadolu Türk Mimarisinde Darüşşifalar (Hastaneler)in Gelişmesi," Ph.D. dissertation, İstanbul University, 1986.
- Cevdet, Melih, "Sivas Darüşşifası Vakfiyesi ve Tercümesi," Vakıflar Dergisi, Vol. I, Ankara, 1938, 35-38.
- Coomaraswamy, Ananda K., The Arts and Crafts of India and Ceylon, New York, 1964.
- Copplestone, Trewin, ed., World Architecture, London, 1981.
- Creswell, K.A.C., The Muslim Architecture of Egypt, Oxford, 1959.

- The Origin of the Cruciform Plan of Cairene Madrasas, Cairo, 1922
- Çakır, Osman, "Anadolu'da Kayseri, Sivas, Çankırı, Kastamonu Amasya Şifahaneleri," M.A. Thesis, Istanbul University, 1975.
- Çetintaş, Sedat, Türk Mimari Anıtları, Osmanlı Devri, Bursa'da İlk Eserler, İstanbul, 1946.
- Türk Mimari Anıtları, Osmanlı Devri, Bursa'da Murat I ve Beyazıd I Binaları, İstanbul, 1952.
- Davis, Fanny, The Palace of Topkapı in İstanbul, New York, 1970.
- Deubner, Otfried, Das Asklepieion von Pergamon (Kürze Vorläufige Beschreibung), Berlin, 1938.
- Diez, Ernst, H. Glück, Die Kunst des Islam, Berlin, 1925.
- Doğan, Ahmet Işık, "Osmanlı Mimarisinde Tarikat Yapıları, Tekkeler, Zaviyeler ve Benzer Nitelikteki Fütüvvet Yapıları," Ph.D. dissertation, İ.T.Ü., 1977.
- Eldem, Sedad Hakkı, Feridun Akozan, Topkapı Sarayı, İstanbul, 1982.
- Esin, Emel, "'Müyanlık' Uygur 'Buyan' Yapısından (Vihara) Hakanlı Müyanlığına (Ribat) ve Selçuklu Han ile Medresesine Gelişme," Malazgirt Armağanı, No. 4, Ankara, T.T.K. Yayınları, 1972, 75-102.
- Evliya Çelebi Seyahatnamesi, Vol. I, Reşad Ekrem Koçu, İstanbul, 1949.
- Anadolu, Suriye, Hicaz (1671-72), Vol. IX, İstanbul, 1935.
- Eyice, Semavi, "Bizans Devrinde İstanbul'da Tababet, Hekimler ve Sağlık Tesisleri," İ.Ü. Tıp Fakültesi Mecmuası, Vol. 21, No. 3, İstanbul, 1958, 657-91.
- "Bizans Hastanelerine Dair," TAÇ Türkiye Anıt Çevre Turizm Değerlerini Koruma Vakfı Yayını, Vol. I, No. 3, İstanbul, 1986.

- "Über die Byzantinischen Krankenhäuser," Historia Hospitalum, Zeitschrift der Deutschen Gesellschaft für Krankenhausgeschichte, Istanbul, 1983-84, 141-163.
- Gabriel, Albert, Une Capitale Turque Brousse Bursa, Paris, 1958.
- Godard, Andre, The Art of Iran, London, 1965.
- "Origine de la Medrese, de la Mosquée et du Caravanserail à Quatre Iwans," Ars Islamica, Vol. XV-XVI, 1951.
- Goodwin, Godfrey, A History of Ottoman Architecture, London, 1971.
- Grube, Ernst, Oleg Grabar, Architecture of the Islamic World Its History and Social Meaning, ed. George Michell, London, 1978.
- Güreşsever, Gönül, "Haseki Darüşşifası," Sanat Tarihi Yıllığı, Vol. V, Istanbul, İ.Ü. Ed. Fak. Sanat Tarihi Enstitüsü, 1973, 101-107.
- Gürkan, Ahmet, İslam Kültürünün Garbı Medenileştirmesi, Istanbul, 1969.
- Gürkan, Kâzım İsmail, "Selçuklu Hastaneleri," Malazgirt Armağanı, No. 4, Ankara, 1972, 33-47.
- "Süleymaniye Darüşşifası," Kanuni Armağanı, Ankara, 1970, 259-67.
- Süleymaniye Darüşşifası, Ankara, 1970.
- Hoag, John D., Islamic Architecture, New York, 1977.
- İlter, Fügen, "Erken Devir Anadolu Türk Mimarisinde 12. ve 13. Yüzyıl Artukoğulları Medreselerinin Yeri," Vakıflar Dergisi, Vol. VIII, Ankara, 1969, 197-208.
- İrdelp, Neşet Ömer, Orta Zamanda Türklerin Tıbbi Hizmetleri, Türk Tarihinin Ana Hatları, No. 28.

Konyalı, İbrahim Hakkı, Abideleri ve Kitabeleri ile Konya Tarihi, Konya, 1964.

- Abideleri ve Kitabeleri ile Üsküdar Tarihi, Vol. I, İstanbul, 1976.
- "Kanuni Sultan Süleyman'ın Annesi Hafsa Sultan'ın Vakfiyyesi ve Manisa'daki Hayır Eserleri," Vakıflar Dergisi, Vol. VIII, Ankara, 1969, 47-56.

Kuban, Doğan, "Architecture of the Ottoman Period," in The Art and Architecture of Turkey, ed. Ekrem Akurgal, New York, 1980, 137-69.

- "Ortaçağ Anadolu-Türk Sanatı Kavramı Üzerine," Malazgirt Armağanı, No. 4, Ankara, 1972, 103-117.

Kuran, Aptullah, Anadolu Medreseleri, Ankara, 1969.

- "Anatolian Seljuk Architecture," in The Art and Architecture of Turkey, ed. Ekrem Akurgal, New York, 1980, 80-110.
- "Haseki Külliyesi," B.Ü. Dergisi, Vol. II 1974, İstanbul, 1975, 57-69.
- "Mimar Sinan'ın İlk Eserleri," Belleten, Vol. 37, No. 148, Ankara, 1973, 533-43.
- The Mosque in Early Ottoman Architecture, The Univ. of Chicago Press, 1968.
- "Üsküdar Atik Valide Külliyesinin Yerleşme Düzeni ve Yapım Tarihi Üzerine," Suut Kemal Yetkin'e Armağan, Hacettepe Üniversitesi Armağan Dizisi I, Ankara, 1984, 231-37.

Lattimore, Owen and Eleanor, Silks, Spices and Empire, Delacorte Press, 1968.

Luttrell, Anthony, The Hospitallers in Cyprus, Rhodes, Greece and the West 1291-1440, London, 1978.

Mac Donald, William L., Early Christian and Byzantine Architecture, New York, 1962.

- Mac Kinney, Loren, Medical Illustrations in Medieval Manuscripts, Los Angeles, 1965.
- Murray, Peter, The Architecture of the Italian Renaissance, New York, 1970.
- Nayır, Zeynep, "Osmanlı Mimarlığında Sultan Ahmet Külliyesi ve Sonrası (1609-1690), Ph.D. dissertation, İ.T.Ü., 1975.
- Osman, Rifat, "Dört Buçuk Asırlık Bir Seririyatımız," Türk Tıp Tarihi Arkivi, Vol. 4, No. 13, İstanbul, 1939.
- Ögel, Semra, Anadolu Selçuklularının Taş Tezyinatı, Ankara, 1966.
- Oney, Gönül, "Dragon Figures in Anatolian Seljuk Art," Belleten, Vol. 33, No. 130, Ankara, 1969, 193-216.
- Önge, Yılmaz, "Çankırı Darüşşifası," Vakıflar Dergisi, Vol. V, Ankara, 1962, 251-55.
- Philipsborn, A., "Iera Nosos und die Spezial-Anstalt des Pantokrator-Krankenhauses," Byzantion, Revue Internationale des Etudes Byzantines, Homage a Bruno Lavagnini, Bruxelles, 1963, 223-30.
- Pope, Arthur Upham, Persian Architecture: The Triumph of Form and Color, New York, 1965.
- Refik, Ahmet, Mimar Sinan, İstanbul, 1931.
- On Altıncı Asırda İstanbul Hayatı, İstanbul, 1935.
- Reyhanlı, Tülay, "Osmanlılarda Külliye Mimarisinin Gelişmesi," Ph.D. dissertation, İ.Ü. Ed. Fak. Sanat Tarihi Bölümü, İstanbul, 1974.
- Rice, Tamara Talbot, The Seljuks in Asia Minor, London, 1961
- Riefstahl, Rudolf M., Turkish Architecture in Southwestern Anatolia, Cambridge, 1931.
- Sargutan, Erdal, "Selçuklularda Tıp ve Tıp Kuruluşları," Vakıflar Dergisi, Vol. XI, Ankara, 313-21..

Sayılı, Aydın, "The Emergence of the Prototype of the Modern Hospital in Medieval Islam," Belleten, Vol. 44, No. 174, Ankara, 1980, 279-87.

- "Bir Kütahya Hastahanesi," Belleten, Vol. 12, No. 47, Ankara, 1948, 679-82.

- "Turkish Contributions to Scientific Work in Islam," Belleten, Vol. 43, No. 172, Ankara, 1979, 715-37.

Sözen, Metin, Anadolu Medreseleri: Selçuklu ve Beylikler Devri, Vol. I-II, Istanbul, 1970-1972

- Diyarbakır'da Türk Mimarisi, Istanbul, 1971.

- Türk Mimarisinin Gelişimi ve Mimar Sinan, Istanbul, 1975.

Şehabettin, "Anadolu'da Selçuki Hastaneleri," Türk Tıp Tarihi Arkivi, Vol. 3, No. 12, Istanbul, 1939.

Şehsuvaroğlu, Bedi N., "Edirne II. Bayezid Darüşşifası," Edirne'nin 600. Fetih Yıldönümü Armağan Kitabı, Ankara, 1965, 257-64.

- Istanbul'da 500 Yıllık Sağlık Hayatımız, Istanbul, 1953.

- "Türk İstanbul'da Tıp Öğretiminin 500. Yıldönümü," İ.Ü. Tıp Fakültesi Mecmuası, Vol. 34, Istanbul, 1971.

Tavernier, J.B., Topkapı Sarayında Yaşam, trans. Perran Üstündağ, Istanbul, 1984.

Terzioğlu, Arslan, "Alberto Bobovio'nun Tarifine Göre Topkapı Sarayındaki Enderun Hastanesinin 17. Yüzyıldaki Teşkilatı," I. Milletlerarası Türkoloji Kongresi, Istanbul, 1979, 874-89.

- Die Architektonischen Merkmale der Seldschukischen, Mameluckischen und Osmanischen Krankenhäuser und

Ihre Einflüsse auf die Abendlaendischen Hospitaeler, Fifth International Congress of Turkish Art, Budapest, 1978.

- "İlk Budist, Hıristiyan, İslam Hastahaneleri ve Birbirleriyle Olan İlişkileri," VII. Türk Tarih Kongresi Ankara 1970, Vol. I, Ankara, 1972, 295-312.
- "Ortaçağ İslam-Türk Hastahaneleri ve Avrupa'ya Tesirleri," Belleten, Vol. 34, No. 133, 121-49.
- "Selçuklu Hastaneleri ve Avrupa Kültürüne Tesirleri," Malazgirt Armağanı, No. 4, Ankara, 1972, 49-66.
- "Türklerin Orta Asya ve Hindistan'da Tesis Ettikleri Hastahaneler," VIII. Türk Tarih Kongresi Ankara 1976, Vol. II, Ankara, 1981, 803-13.

Topkapı Sarayı Müzesi Rehberi, İstanbul, 1933.

Tsang, Hsüan, Buddhist Records of the Western World, trans. Samuel Beal, 2 vols., London, 1884.

Tuncer, Orhan, "Son Kazıların Işığı Altında Sivas Şifahanesi Planı," I. Milletlerarası Türkoloji Kongresi İstanbul 1973, İstanbul, 1979, 911-29.

Turan, Osman, "Celâleddin Karatay, Vakıfları ve Vakfiyeleri," Belleten, Vol. 12, No. 45, Ankara, 1948, p.75.

- Selçuklular Tarihi ve Türk-İslam Medeniyeti, Ankara, 1965.

Uludağ, Osman Şevki, Osmanlı Tababeti Tarihi, Vol. I, 1918.

- Tababet, Osmanlılar Devri, Türk Tarihinin Ana Hatları, No. 25.

Uzluk, Feridun Nafiz, Genel Tıp Tarihi, Ankara, 1958.

Ülgen, Ali Saim, "Divriği Ulu Camii ve Darüşşifası," Vakıflar Dergisi, Vol. V, Ankara, 1962, 93-98.

Ünal, Ahmet, "Hitit Tıbbının Ana Hatları," Belleten, Vol. 44, No. 175, Ankara, 1980, 475-96.

Ünsal, Behçet, Turkish Islamic Architecture: in Seljuk and Ottoman Times 1071-1923, London, 1959.

Ünver, A. Süheyl, "Anadolu Selçuklularında Sağlık Hizmetleri," Malazgirt Armağanı, No. 4, Ankara, 1972.

- Halil Bayrı, "Artukoğulları ve Mardin'deki Hastahaneleri," Türk Tıp Tarihi Arkivi, Vol. 5, No. 17, İstanbul, 1940, 27-32.

- "Büyük Selçuklu İmparatorluğu Zamanında Vakıf Hastanelerinin Bir Kısımına Dair," Vakıflar Dergisi, Vol. I, Ankara, 1938.

- Büyük Türk Hekimi ve Feylesofu İbni Sina, İstanbul, 1937.

- Cerrahiyei İlhaniye, İstanbul, 1939.

- "Edirne Darüşşifası Tarihi 891/1486," Türk Tıp Tarihi Arkivi, Vol. 5, No. 18, İstanbul, 1940, 80-82.

- Fatih Darüşşifası, İstanbul, 1932.

- "Fatih Darüşşifası Planı," Türk Tıp Tarihi Arkivi, Vol. 6, No. 21-22, İstanbul, 1943.

- Fatih, Külliyesi ve Zamanı İlim Hayatı, İstanbul, 1946.

- "Fatih Külliyesinin İlk Vakfiyesine Göre Fatih Darüşşifası," Türk Tıp Tarihi Arkivi, Vol. 5, No. 17, İstanbul, 1940, 13-17.

- Haseki Hastahanesi, İstanbul, 1939.

- "İstanbul'un Zaptından Sonra Türklerde Tıbbi Tekamüle Bakış," Vakıflar Dergisi, Vol. I, Ankara, 1938.

- "Manisa'da Dört Asırlık Hafsa Sultan Hastanesi Hakkında," Yeni Tıp Alemi Dergisi, Vol. V, No. 26, İstanbul, 1953.

- "Orta Zamandan XVII. Asra Kadar Türk Hastaneleri Tarihi," İ.Ü. Tıp Fak. Mecmuası, No. 9-10, İstanbul, 1932, 341-44.
- Resimli Türk Tıp Tarihi Albümü
- Selçuk Tababeti, Ankara, 1940.
- "Süleymaniye Külliyesinde Darüşşifa, Tıp Medresesi ve darül'Akakir'e Dair," Vakıflar Dergisi, Vol. II, Ankara, 1942, 195-207.
- Tıp Tarihi: Tarihten Evvelki Zamandan İslam Tababetine Kadar, İstanbul, 1938.
- "Türkiye'de Tababet ve Hıfzısıhha Tarihi Hakkında," Türk Tıp Tarihi Arkivi, Vol. I, No. I, İstanbul, 1935.
- Türk Tıp Tarihi Arkivi, İstanbul, 1940.
- "Türk Tıp Tarihinin Esasları," İ.Ü. Tıp Fak. Mecmuası, İstanbul, 1958.
- Umumi Tıp Tarihi: Bazı Resimler ve Vesikalar, İstanbul, 1943.
- Uygurlarda Tababet, İstanbul, 1936.
- "750 Sene Önce Kayseri'de Açılan İlk Tıp Mektebi ve Kliniği," Dirim Mecmuası, No. 3, İstanbul, 1955.
- Zur Geschichte der Medizin und der Hygiene in der Türkei, İstanbul, 1934.

Wilber, Donald N., The Architecture of Islamic Iran: The Il Khanid Period, New Jersey, 1955.

Yetkin, Suut Kemal, Türk Mimarisi, Ankara, 1970.

Yetkin, Şerare, "Anadolu'da Selçuklu Şifahaneleri," Türk Kültürü, No. 10, Türk Kültürünü Araştırma Enstitüsü, 1963.

Yörükoğlu, Nihad Nuri, Manisa Bimarhanesi, İstanbul, 1948.

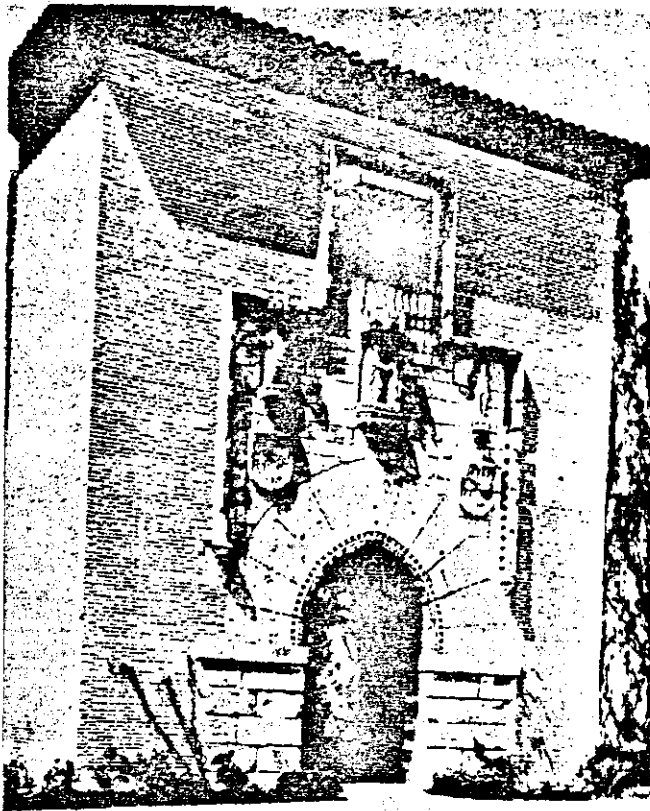
Zeydan Corci, Medeniyeti İslamiye Tarihi, Vol. I.



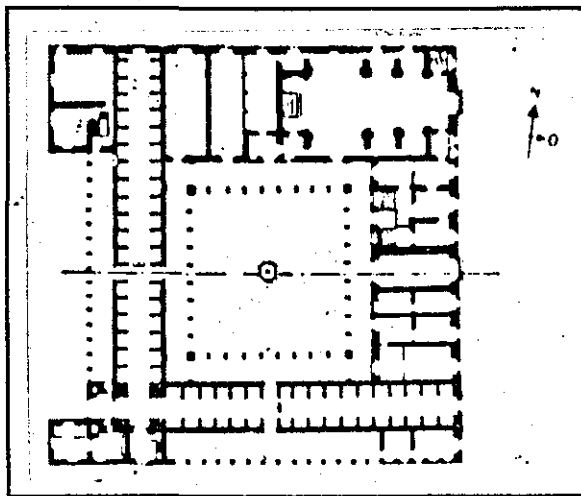
1. Famed physician ar-Razi conducting chemical experiments in a hospital. (Luis Figuier- Vies des Savants illustres du Moyen Âge, Paris, 1847)



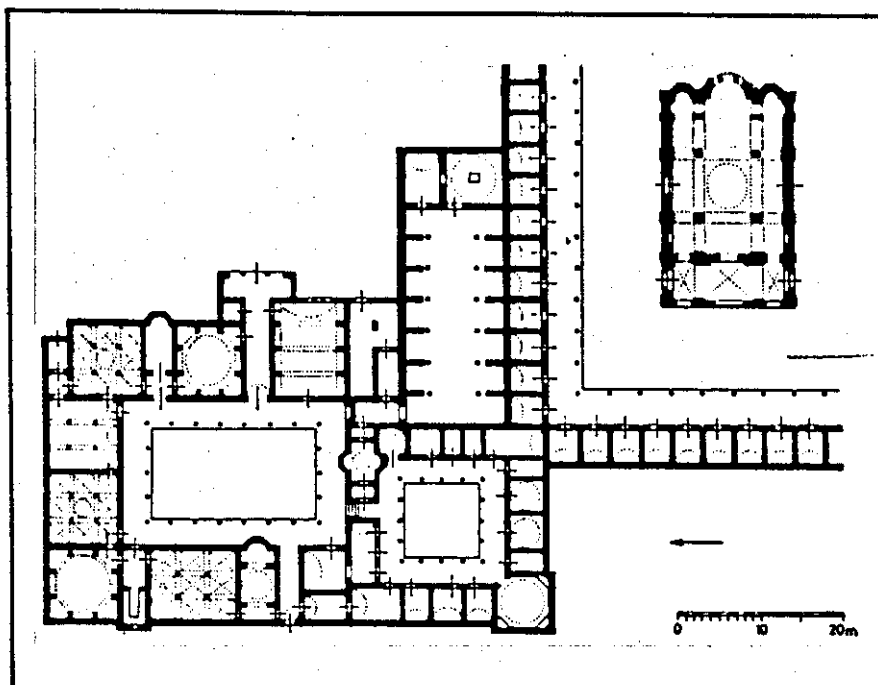
2. Manuscript from 15th century France showing a western out-patient clinic. (Mac Kinney)



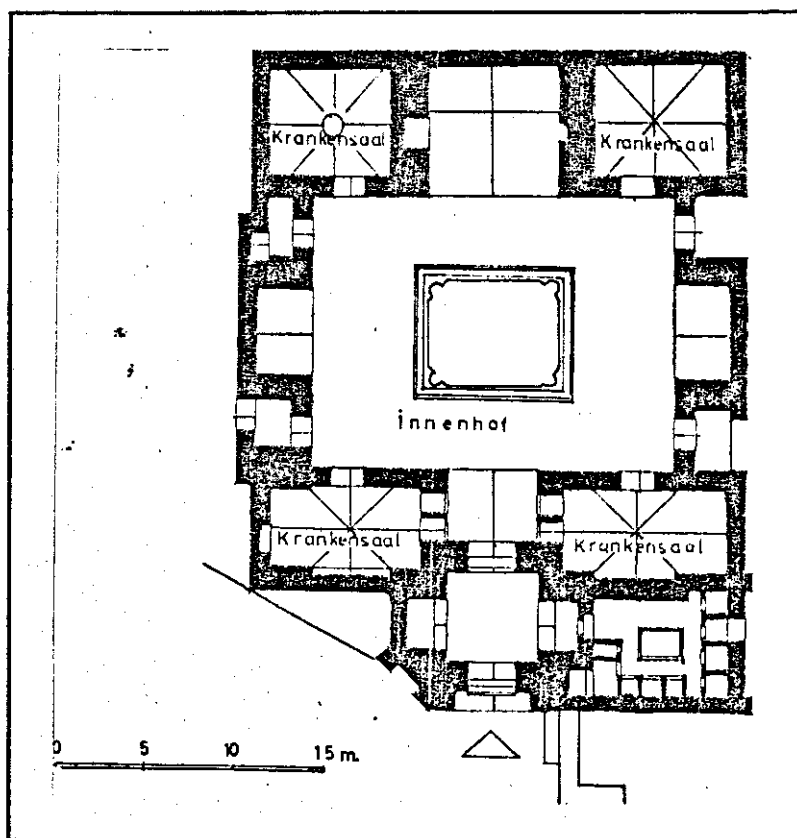
3. Portal of Hopital de Latina
(1499) in Madrid (Terzioğlu)



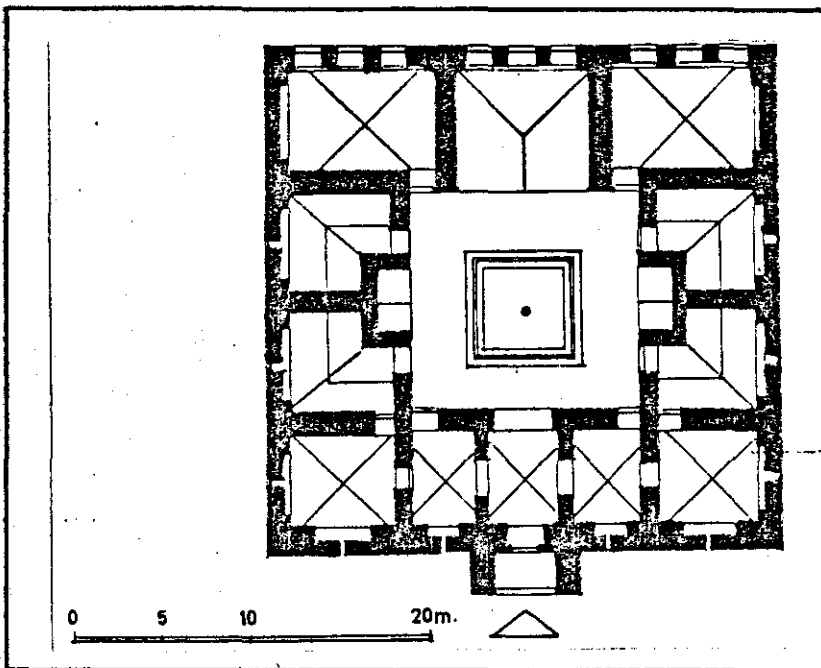
4. Hospital of Medina del Campo, plan
(Terzioğlu)



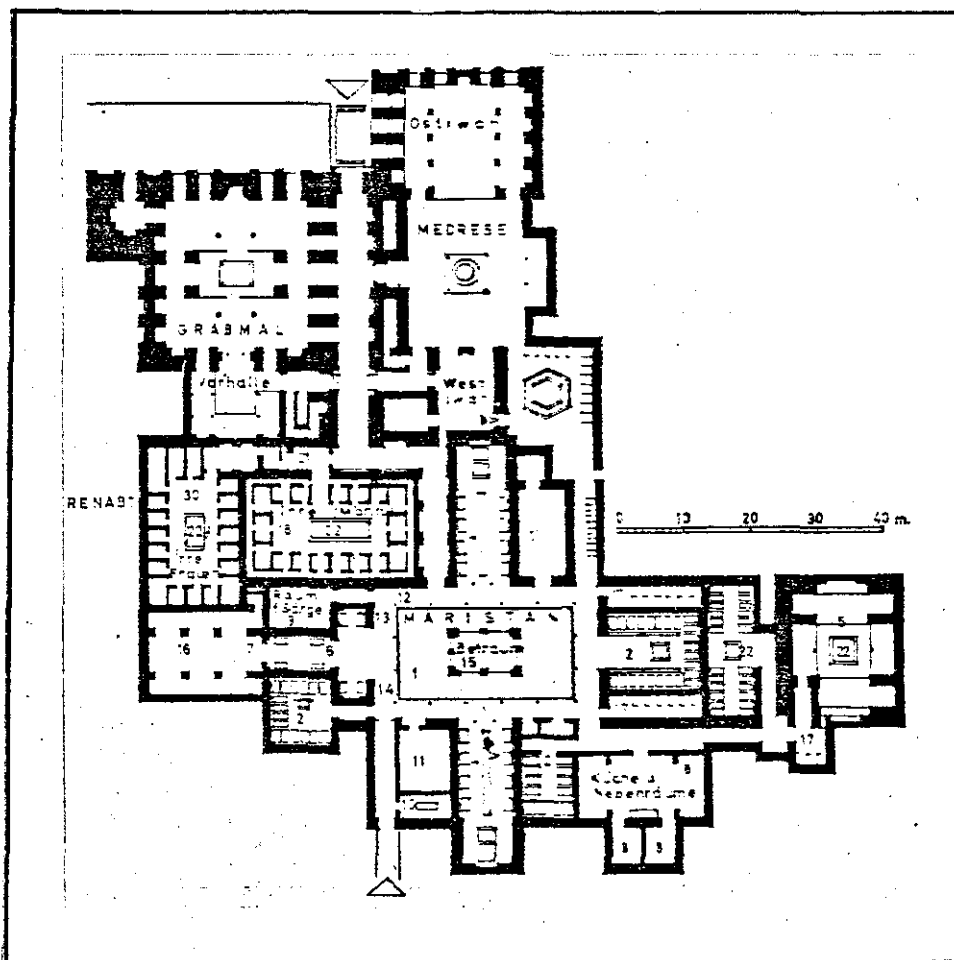
5. Plan of the Pantocrator hospital by Orlandos. (Eyice)



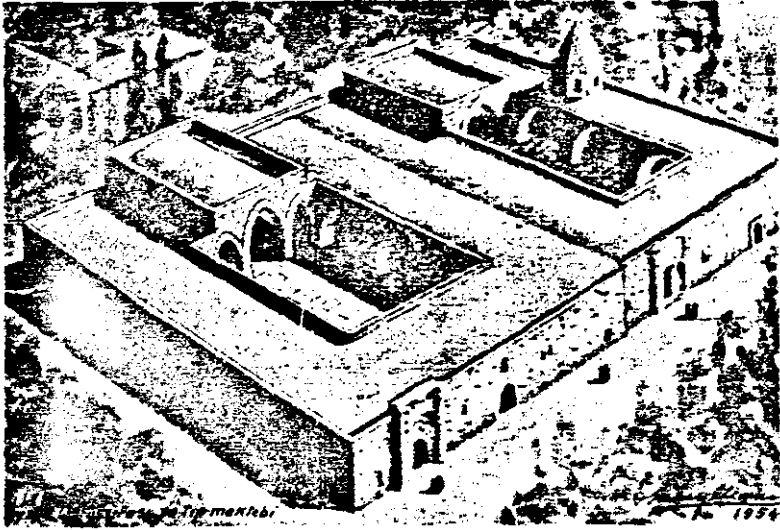
6. Hospital of Nureddin Zengi (1154) in Damascus. (Terzioğlu)



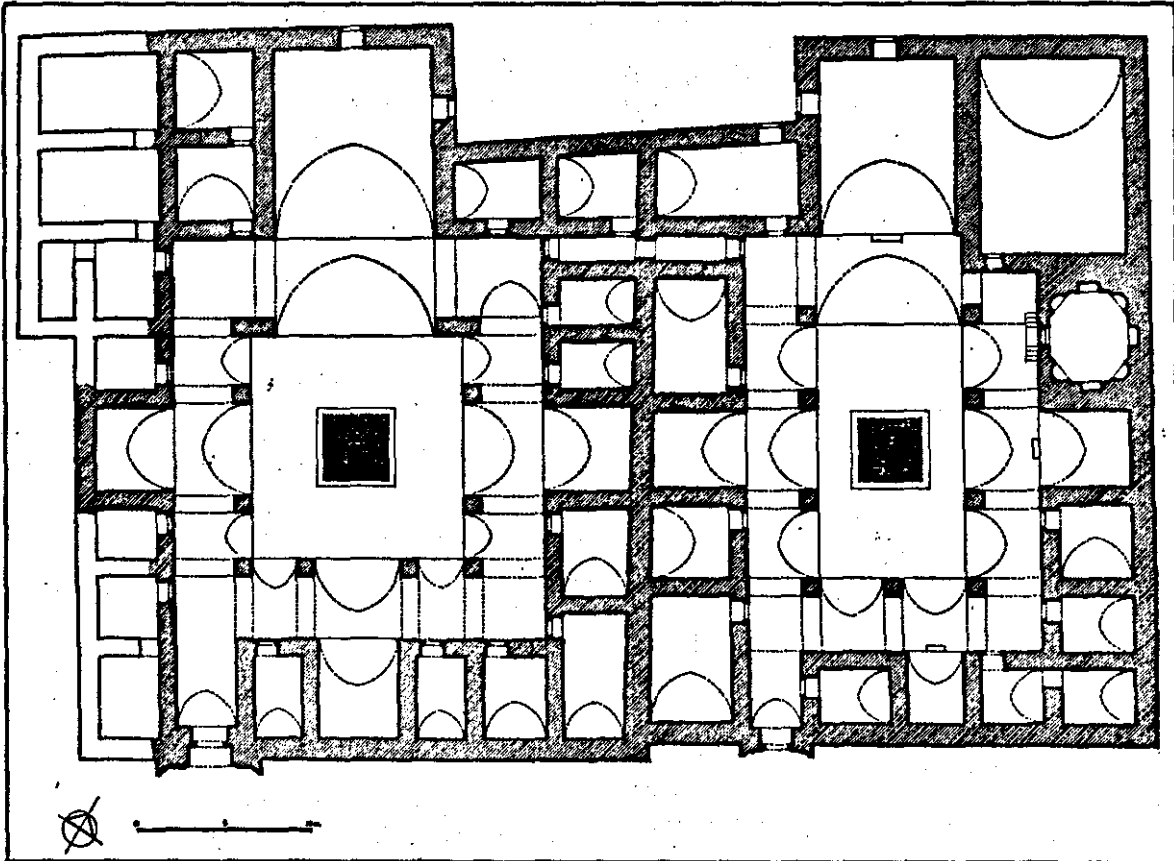
7. Hospital of Kaymeri (1248) in Damascus, plan (Terzioğlu)



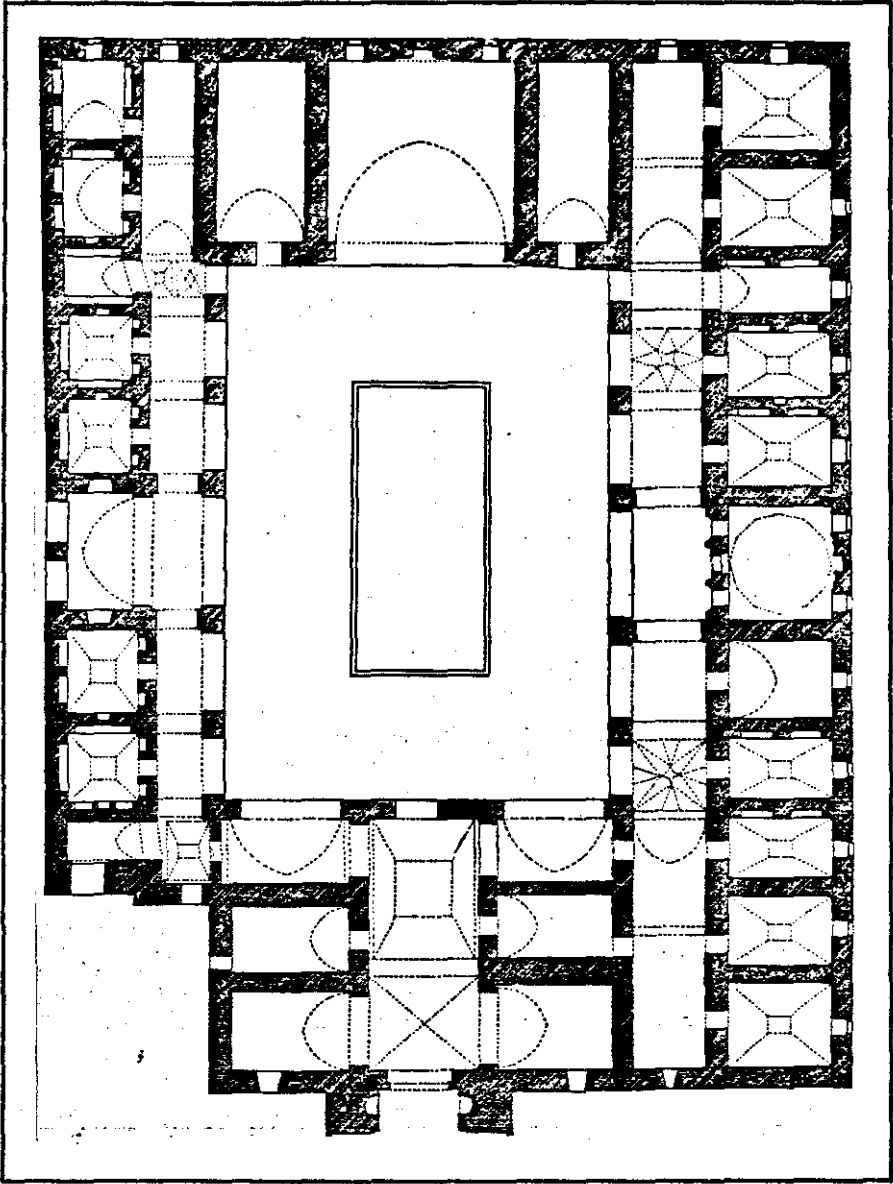
8. Hospital of Sultan Kalaun (1284) in Cairo, plan (Terzioğlu)



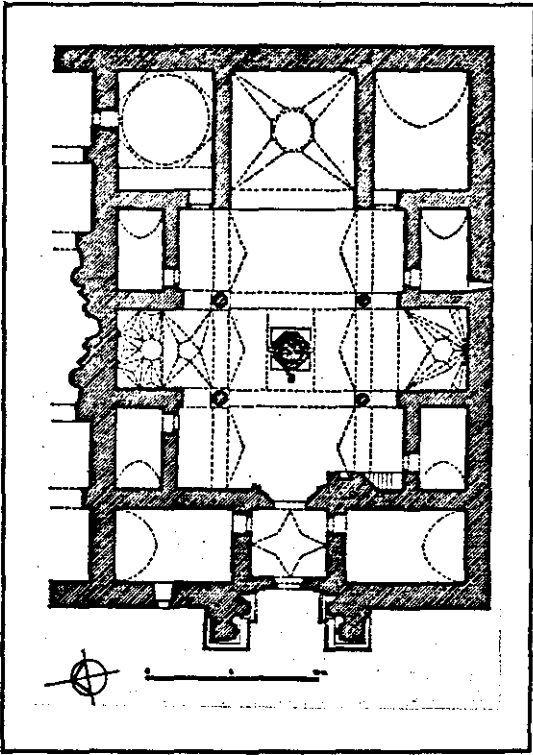
9. Şifaiye and medrese of Gevher Nesibe Hatun (1205-1206) in Kayseri, (Ünver)



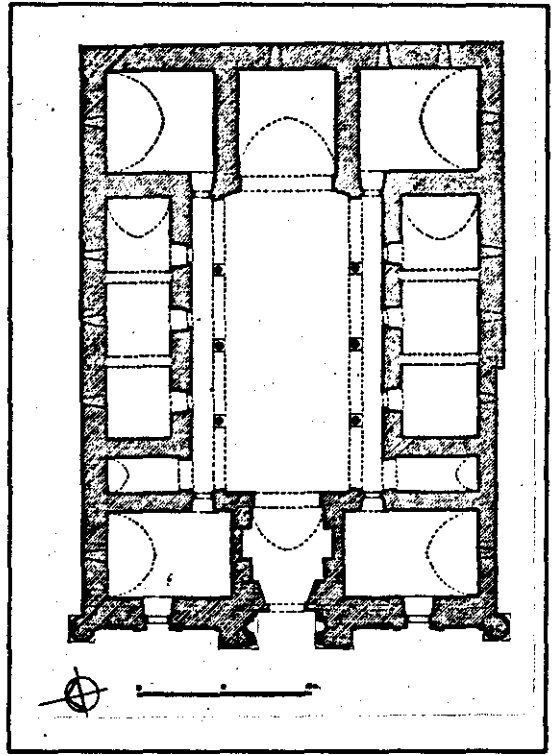
10. Şifaiye and medrese of Gevher Nesibe, plan (Kuran)



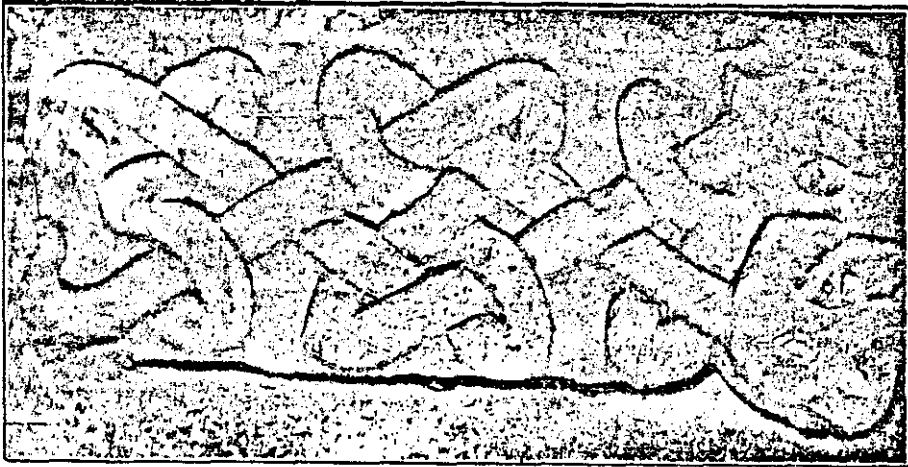
11. Şifaiye of Keykâvus I (1217) in Sivas,
plan (Kuran)



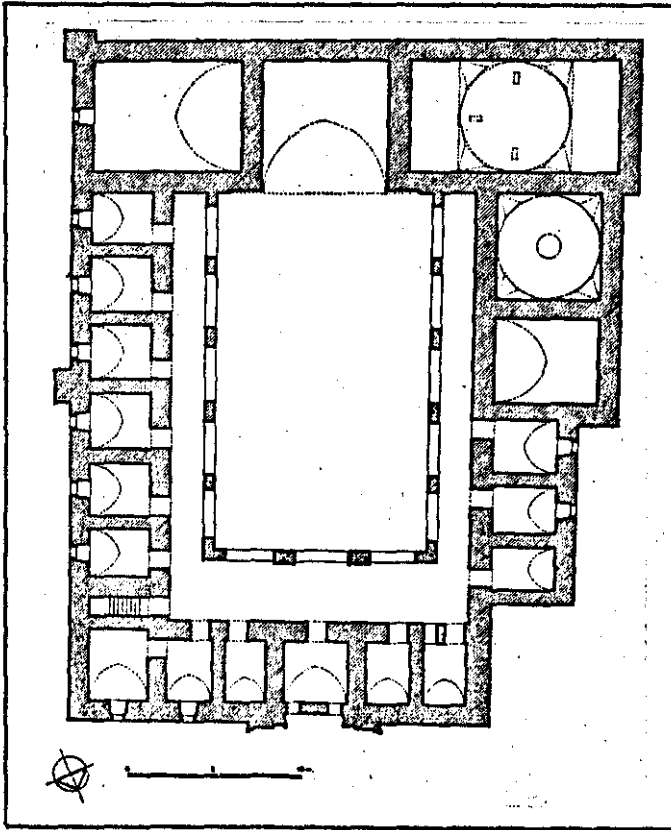
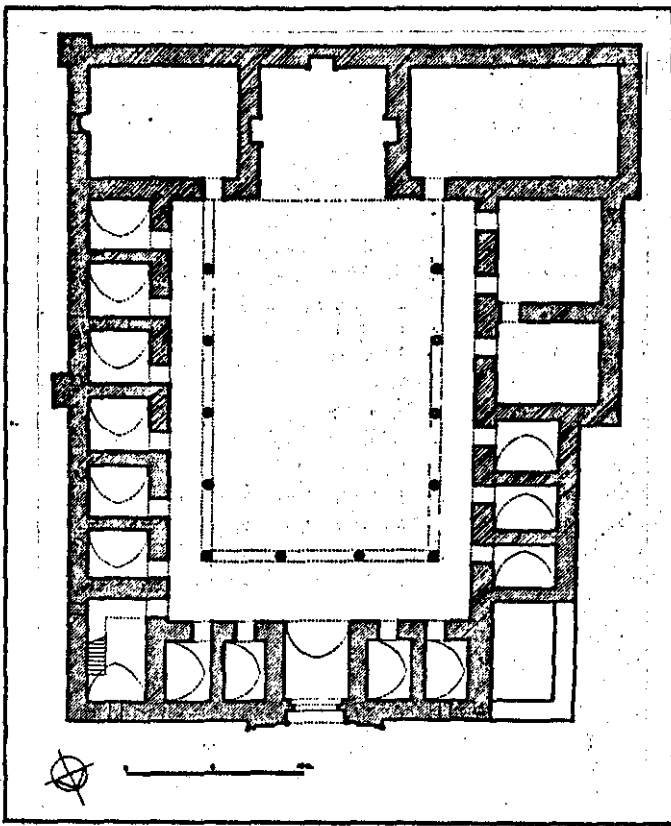
12. Şifaiye of Turan Melik (1228) in Divriği, plan (Kuran)



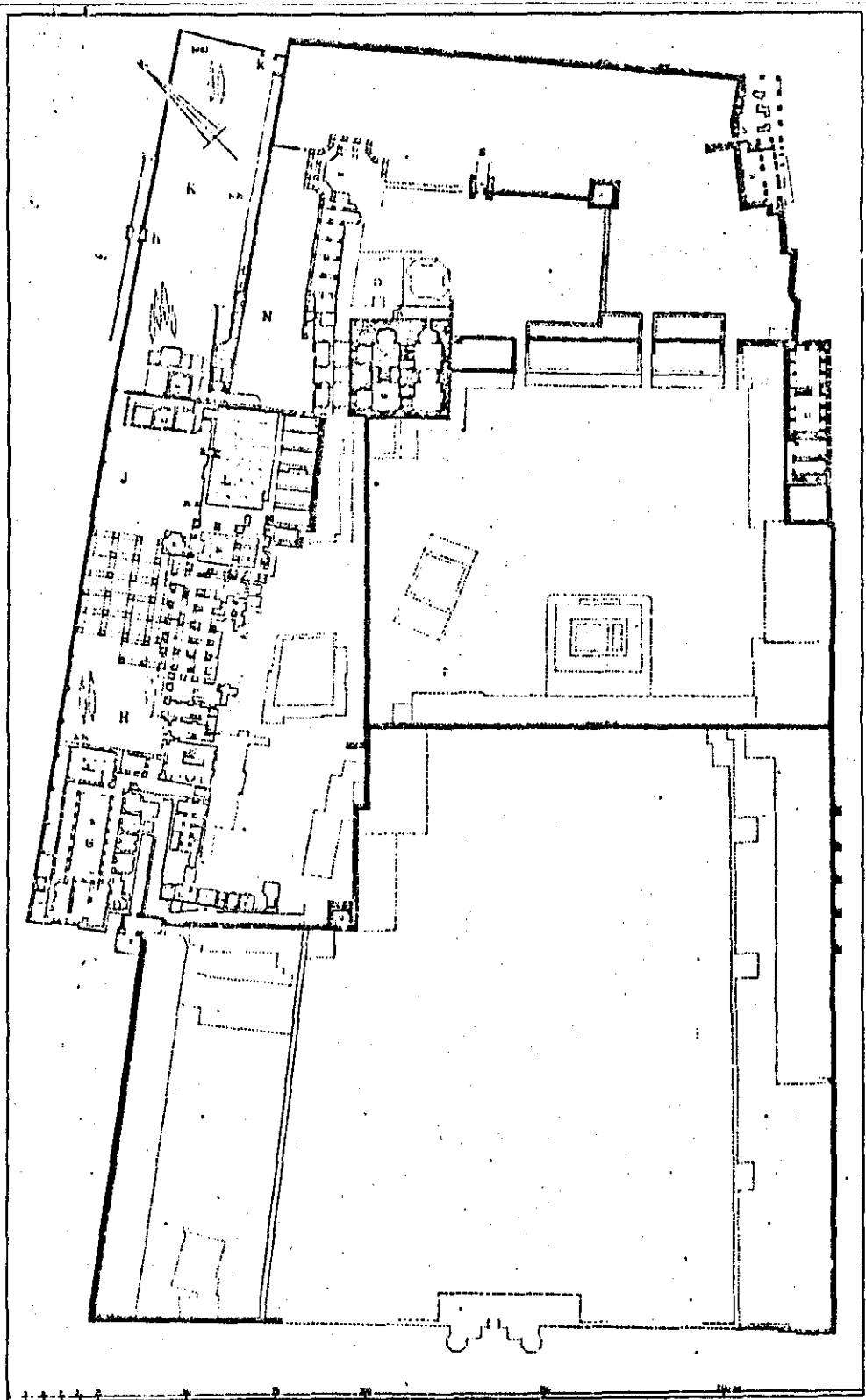
13. Şifaiye of Amber bin Abdullah (1308) in Amasya, plan (Kuran)



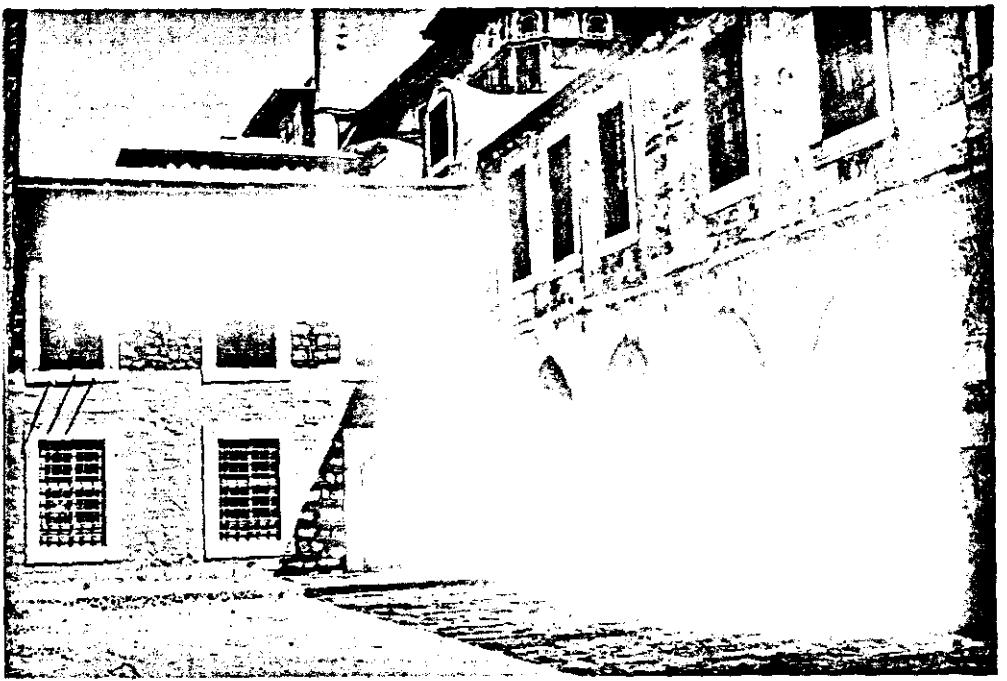
14. Stone relief of a snake motif, şifaiye of Atabey Ferruh, Çankırı (Ünver)



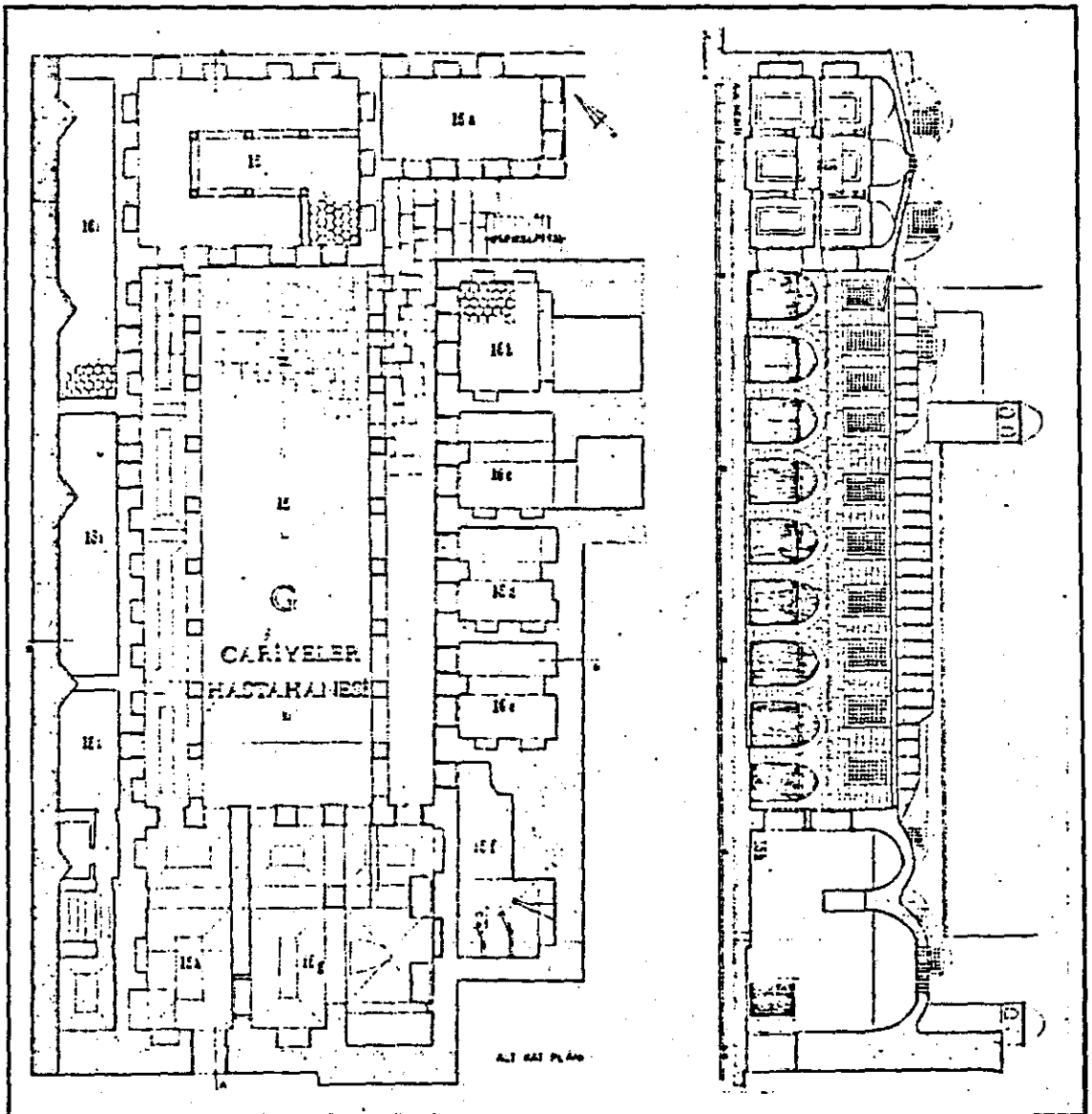
15. Plan of Gök Medrese (1275) in Tokat, ground and first floor (Kuran)



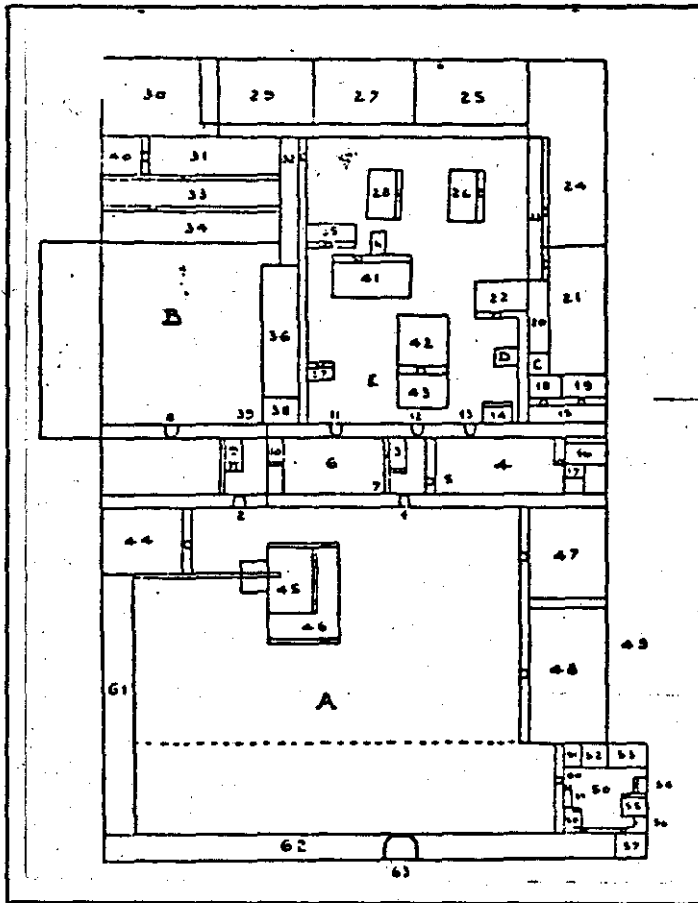
16. Plan of Topkapı Palace (Eldem)



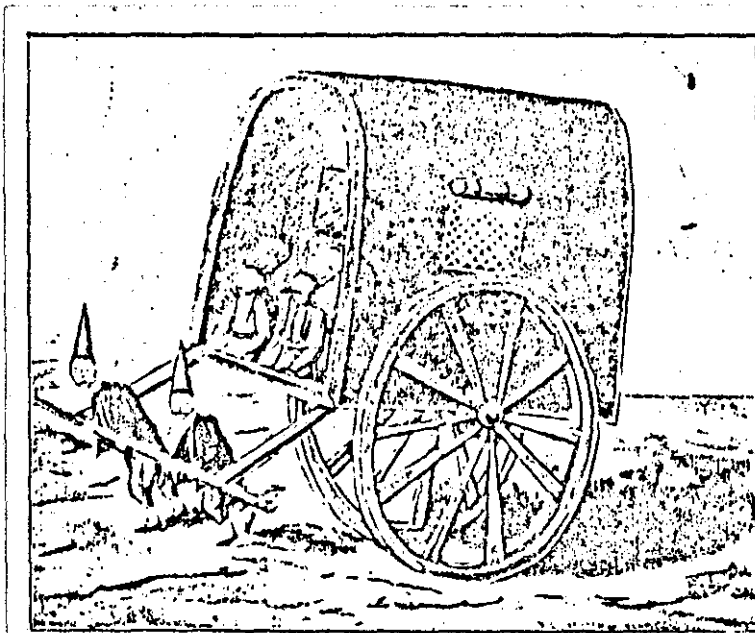
17. Courtyard of the harem hospital, Topkapı Palace



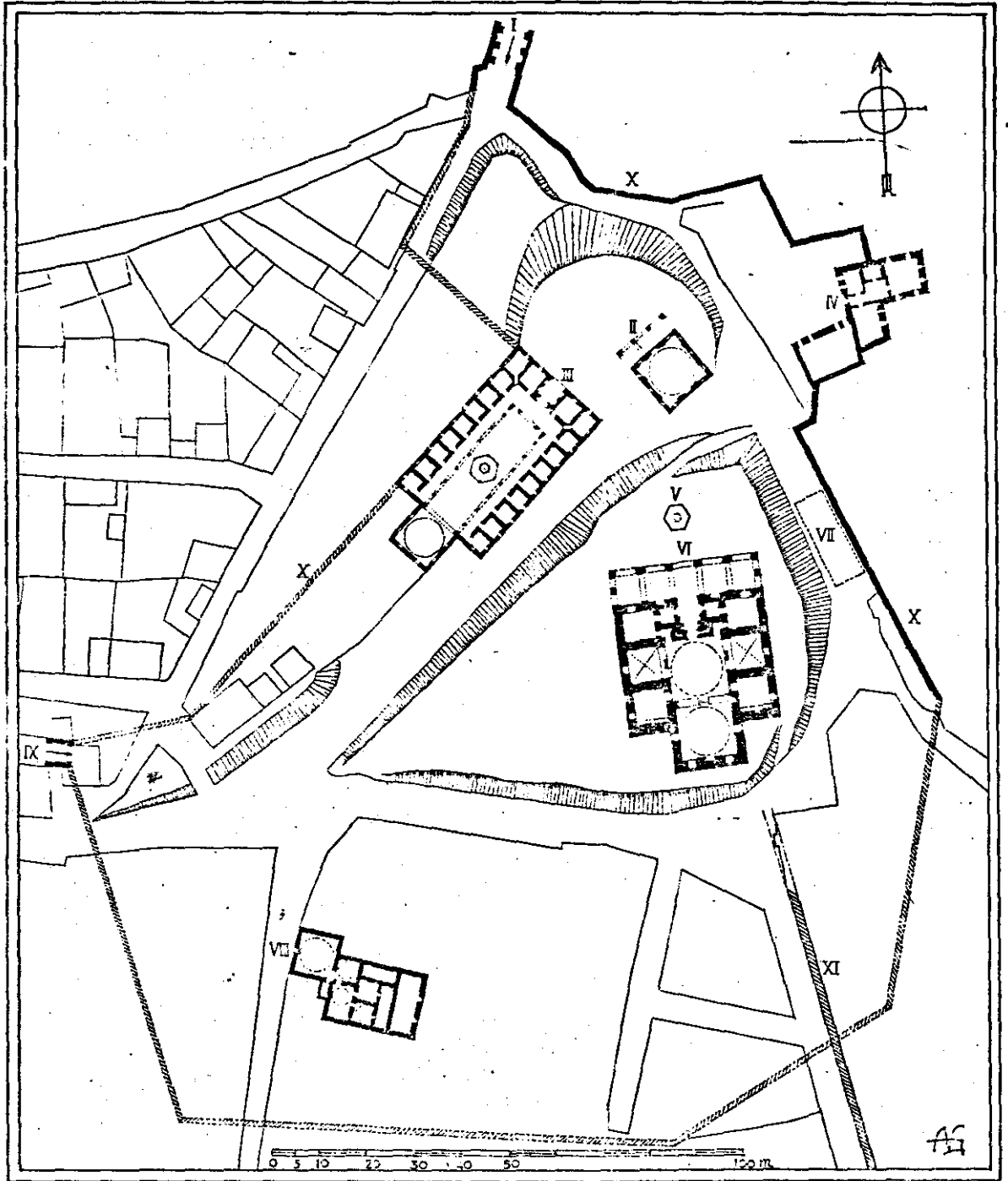
18. Ground floor plan and section of the harem hospital, (Eldem)



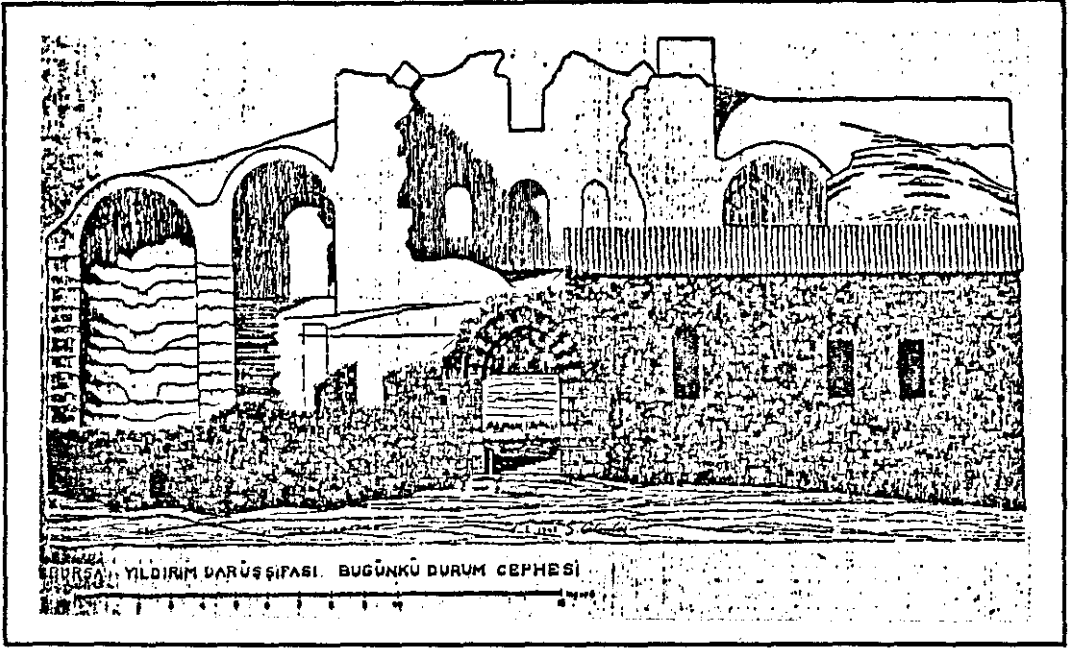
19. Plan of Enderun hospital by Bobovio (Eldem)



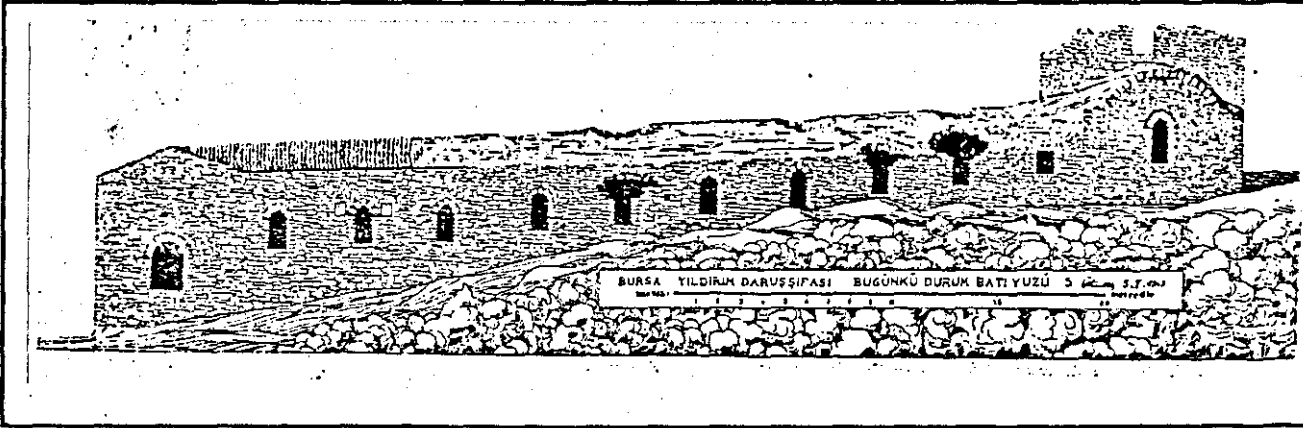
20. Two-wheeled cart (Ünver)



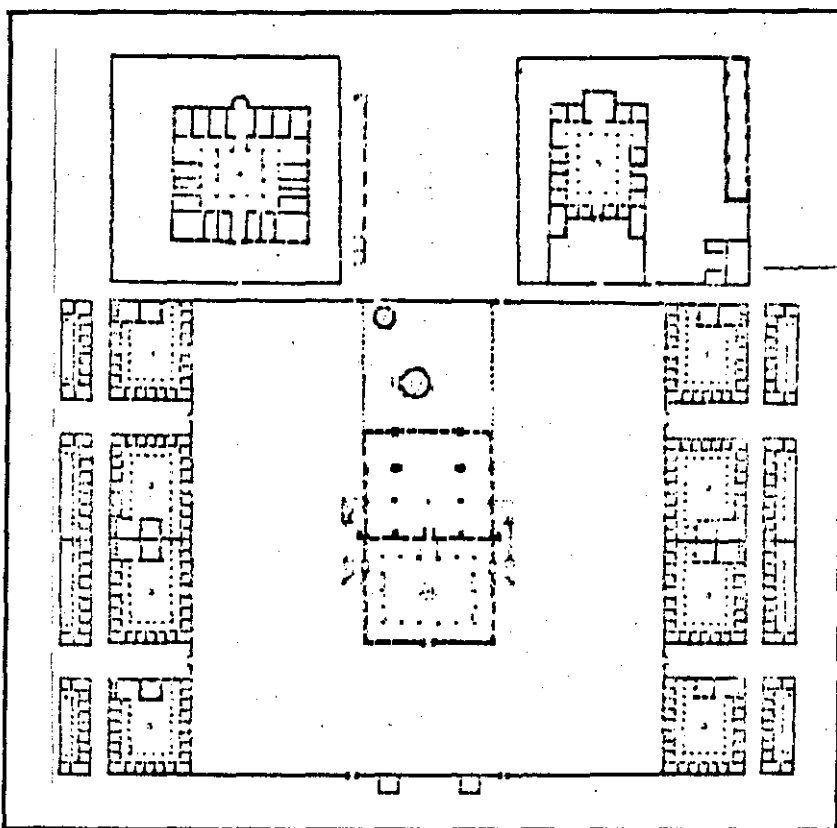
21. Complex of Yıldırım Bayazıd, plan (Gabriel)



23. Darüşşifa of Yıldırım, entrance façade (Çetintaş)



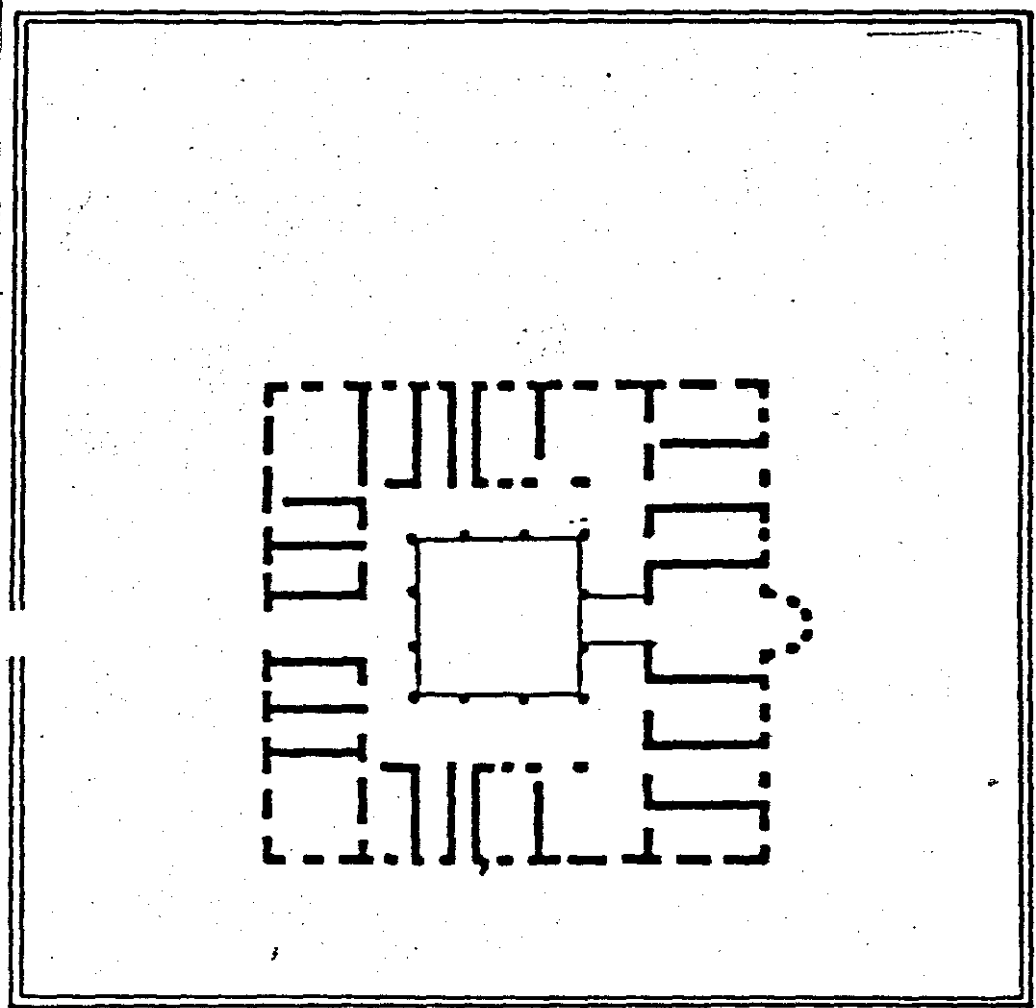
24. Darüşşifa of Yıldırım, western façade (Çetintaş)



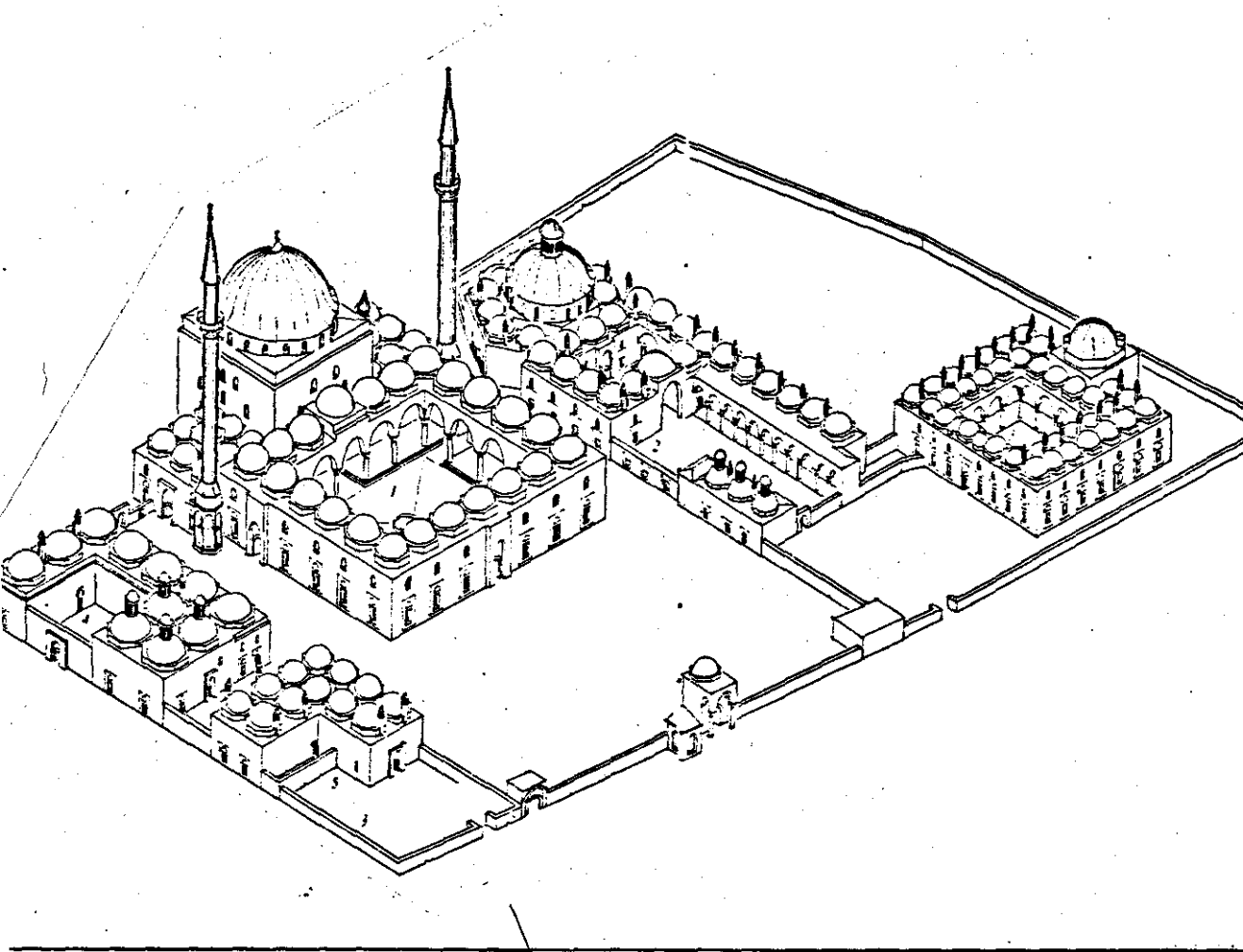
25. Complex of Fatih, plan (Ayverdi)



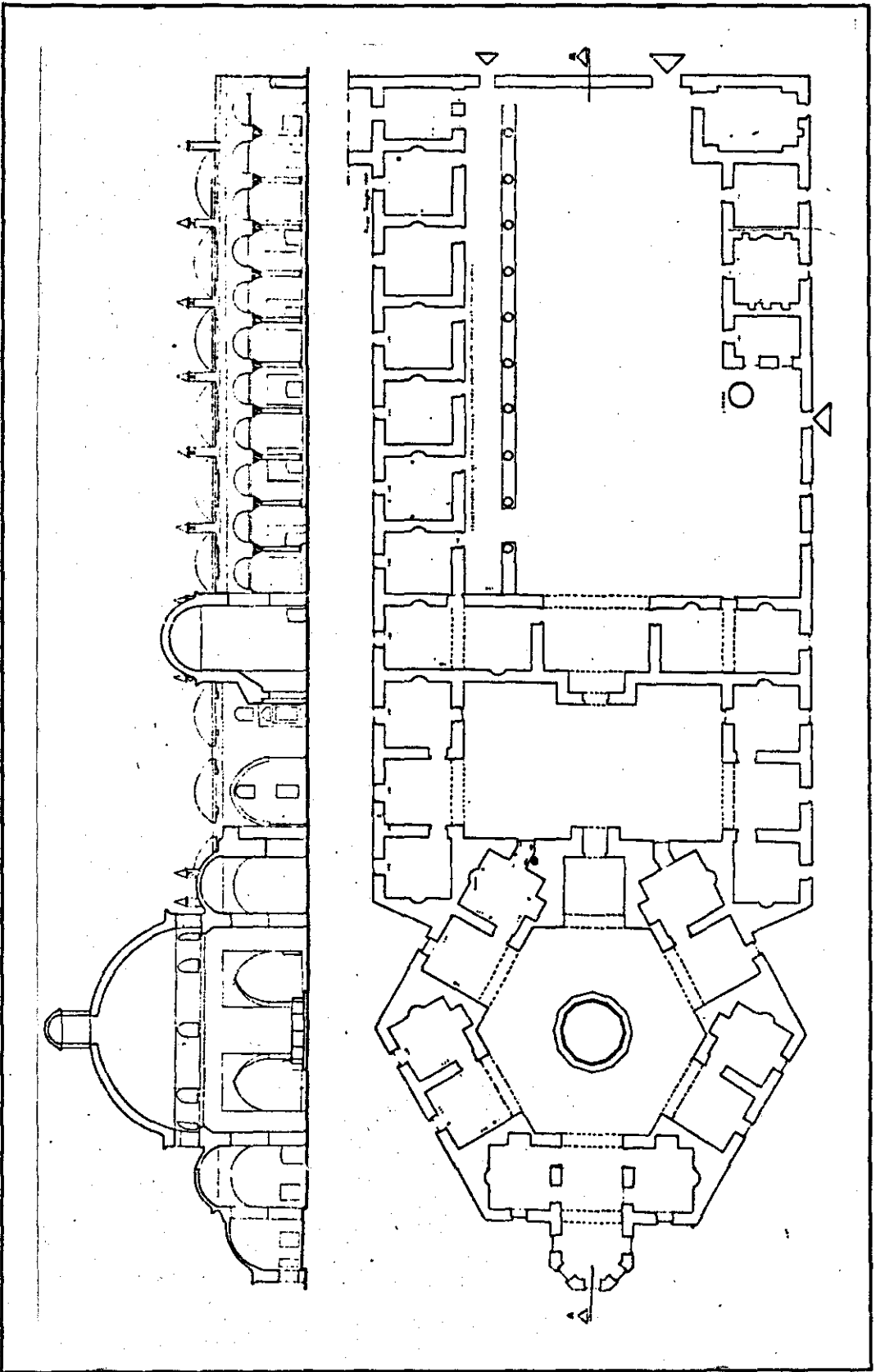
26. Fatih mosque and darüşşifa in 1557
by Melchior Lorichs (Ünver)



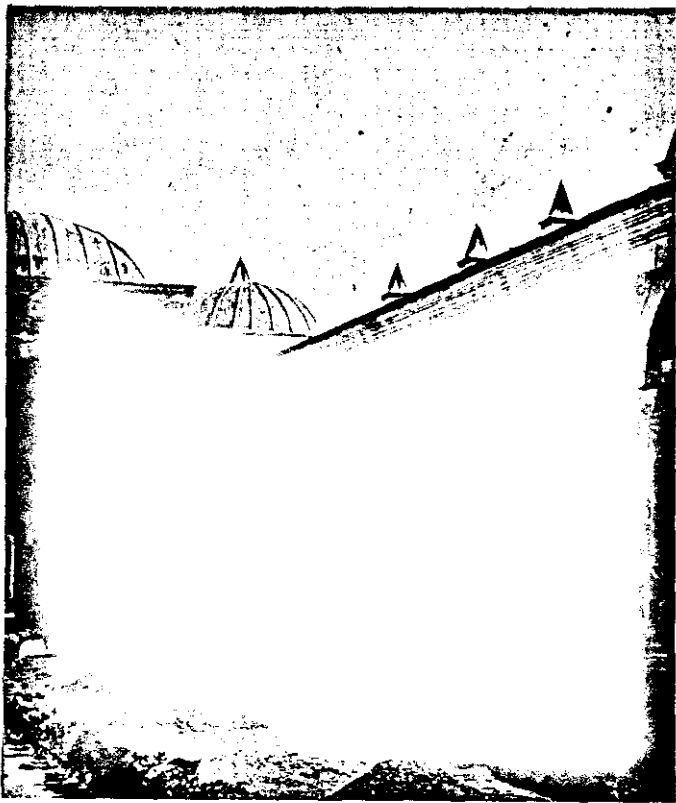
27. Plan of the darü'ssifa of Fatih (Ayverdi)



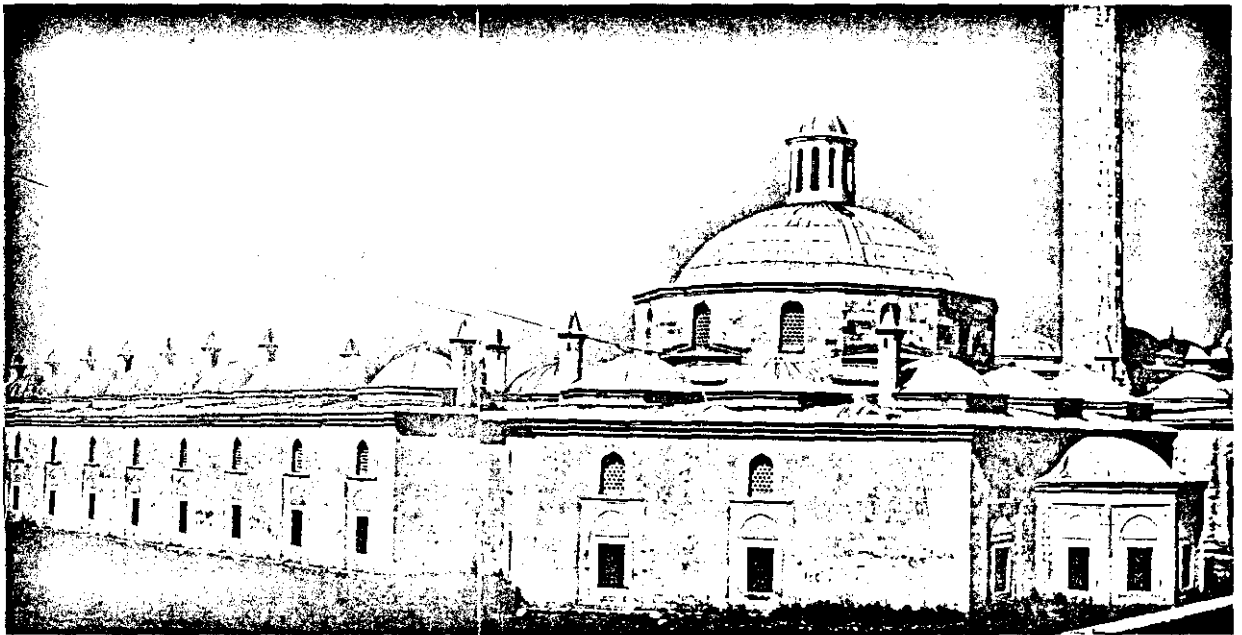
28. Complex of Bayazid II; isometric view (by Kâni Kuzucular)



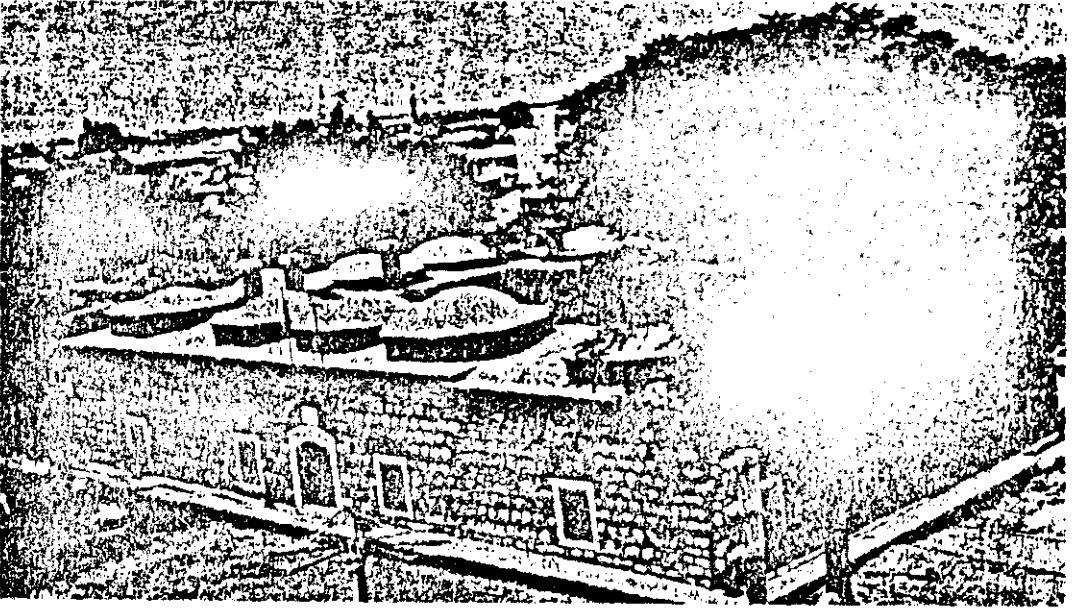
29. Plan and section of the darü'ssifa of Bayazid II (Terzioğlu)



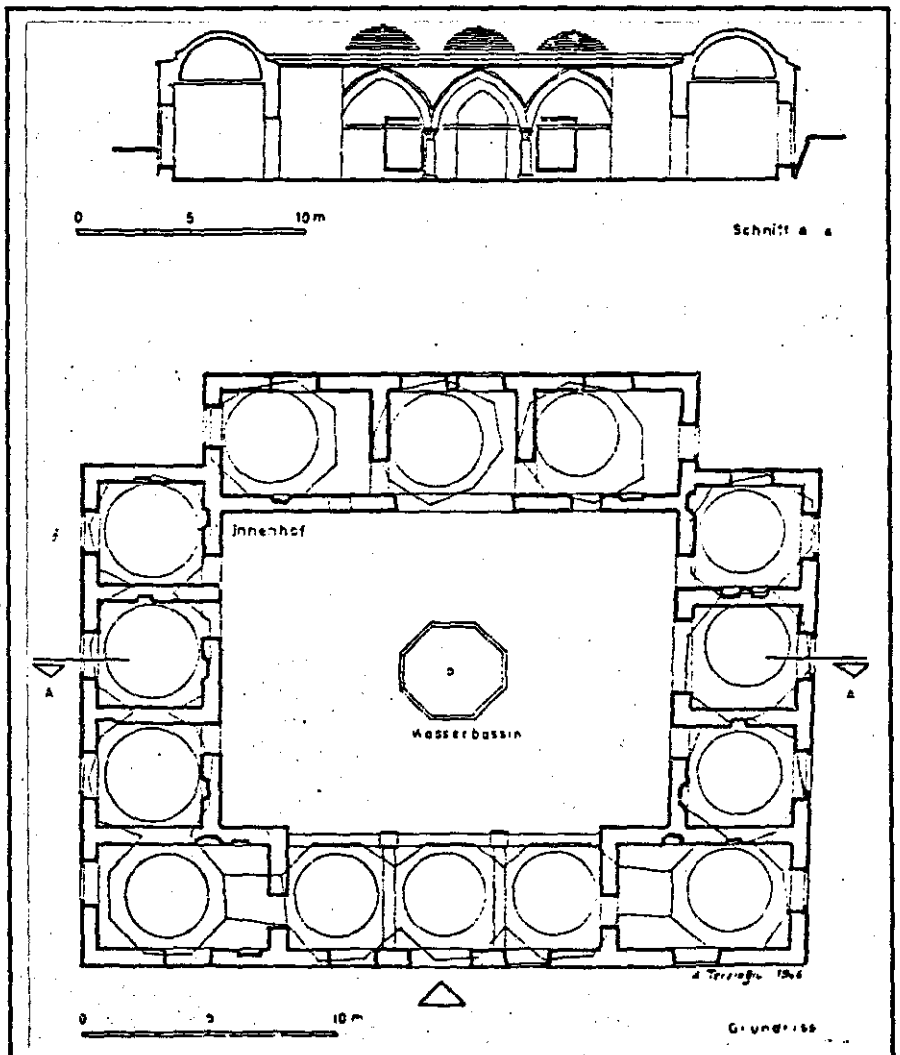
30. Darüşşifa of Bayazid II,
outer courtyard



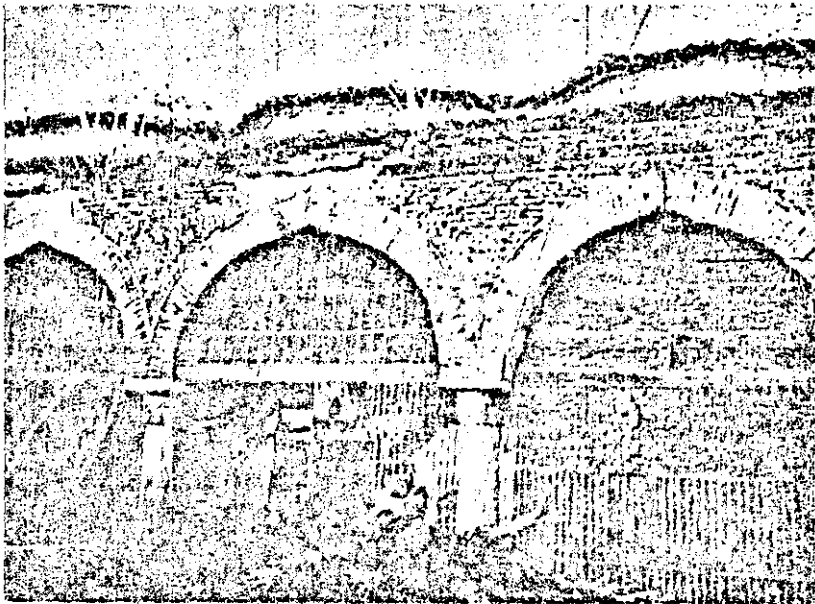
31. Darüşşifa of Bayazid II, façade



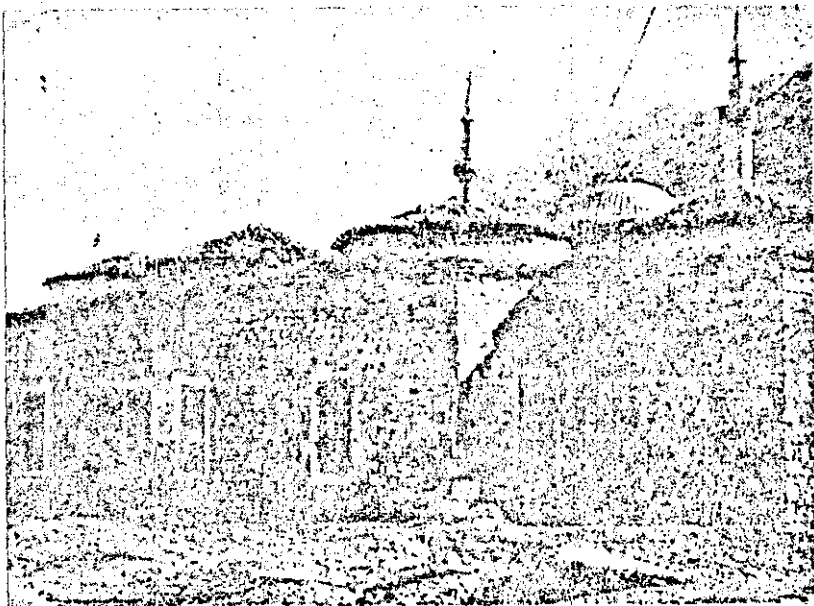
32. Darü'ssifa of Hafsa Sultan, Manisa (Konyalı)



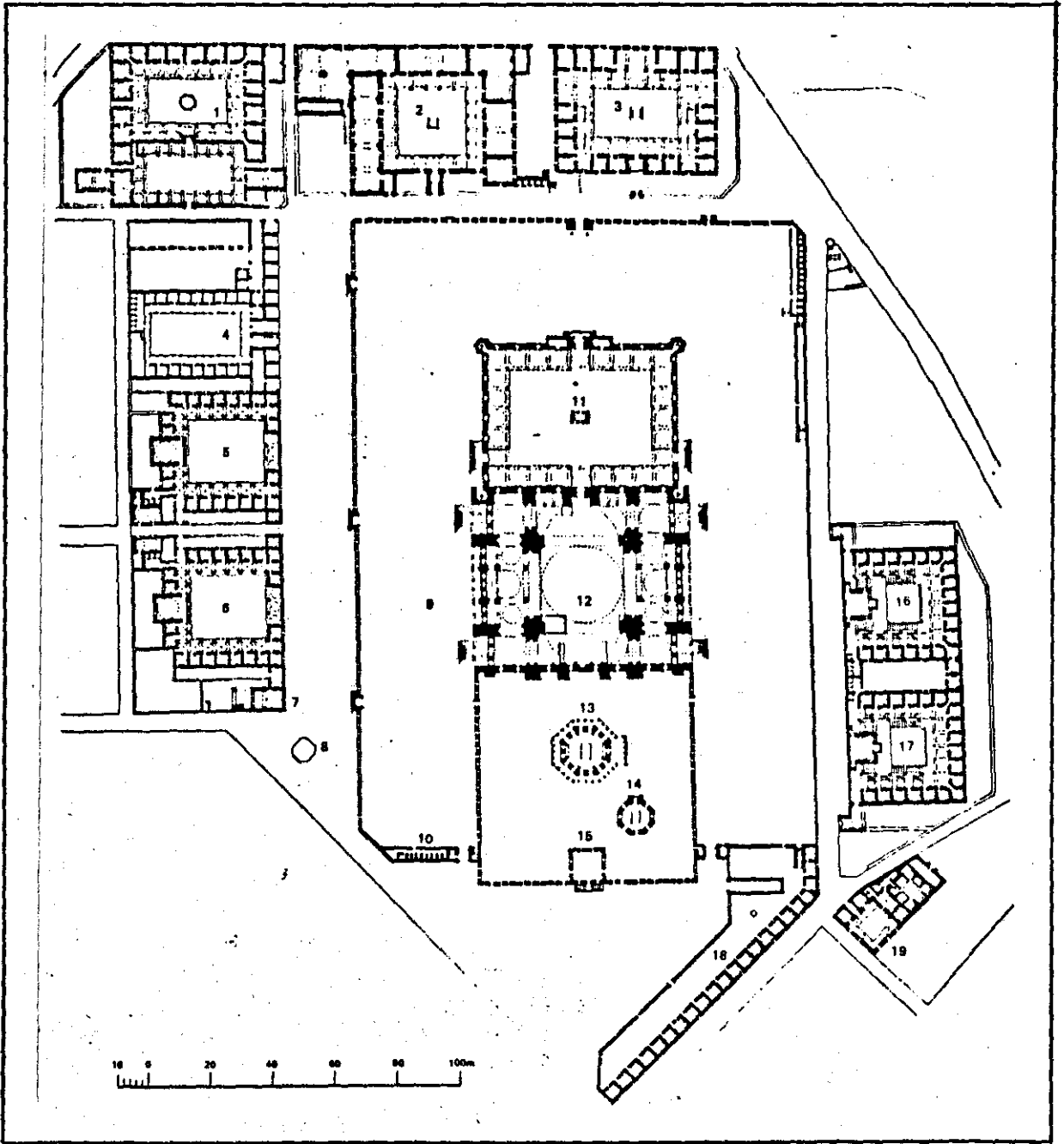
33. Plan and section of the darü'ssifa of Hafsa Sultan (Terzioğlu)



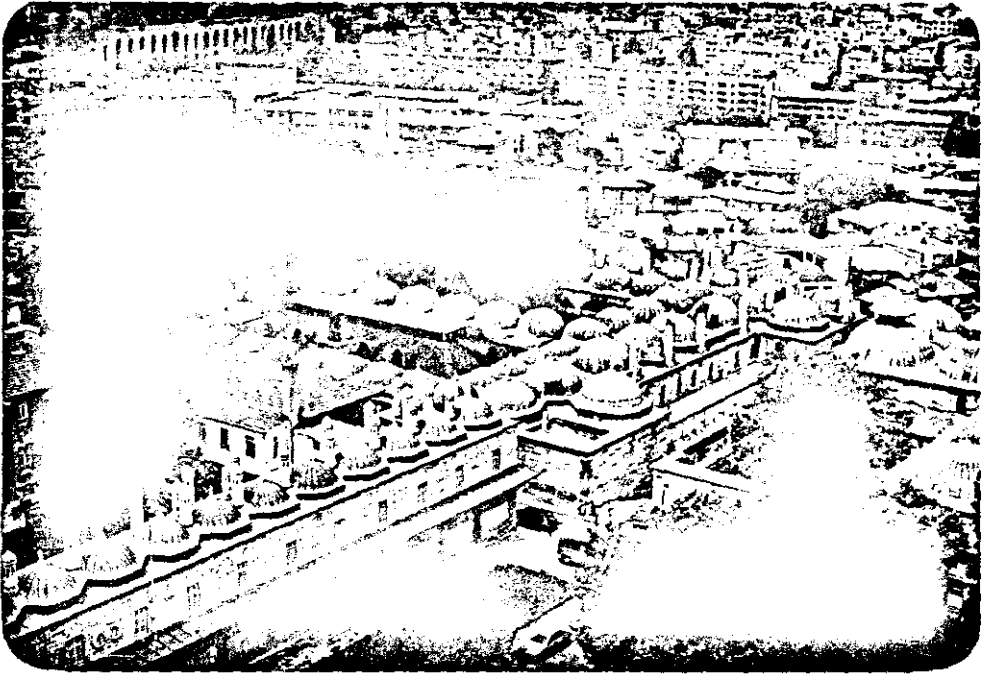
34. Darüşşifa of Hafsa Sultan, courtyard
(Yörükoğlu)



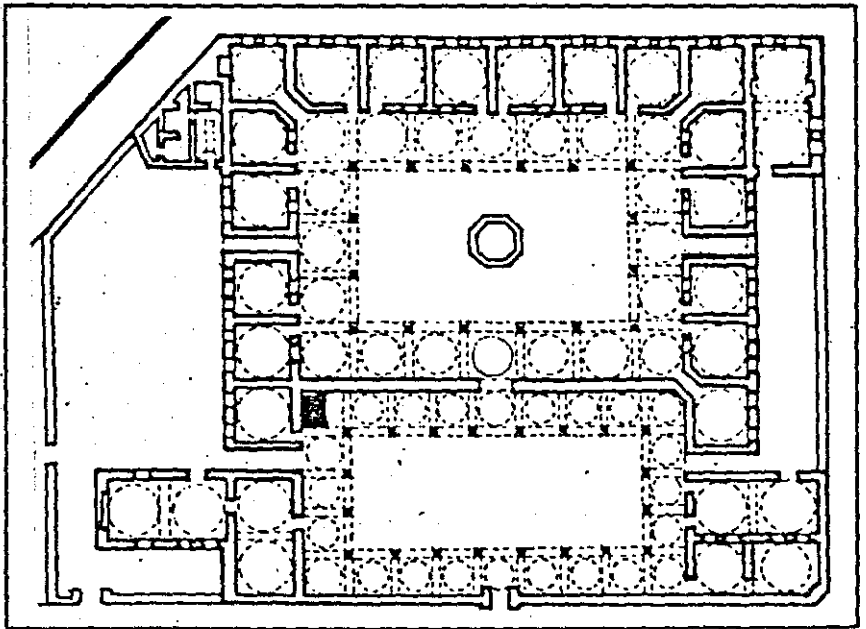
35. Darüşşifa of Hafsa Sultan, northern
façade (Yörükoğlu)



36. Complex of Süleymaniye, plan (Goodwin)



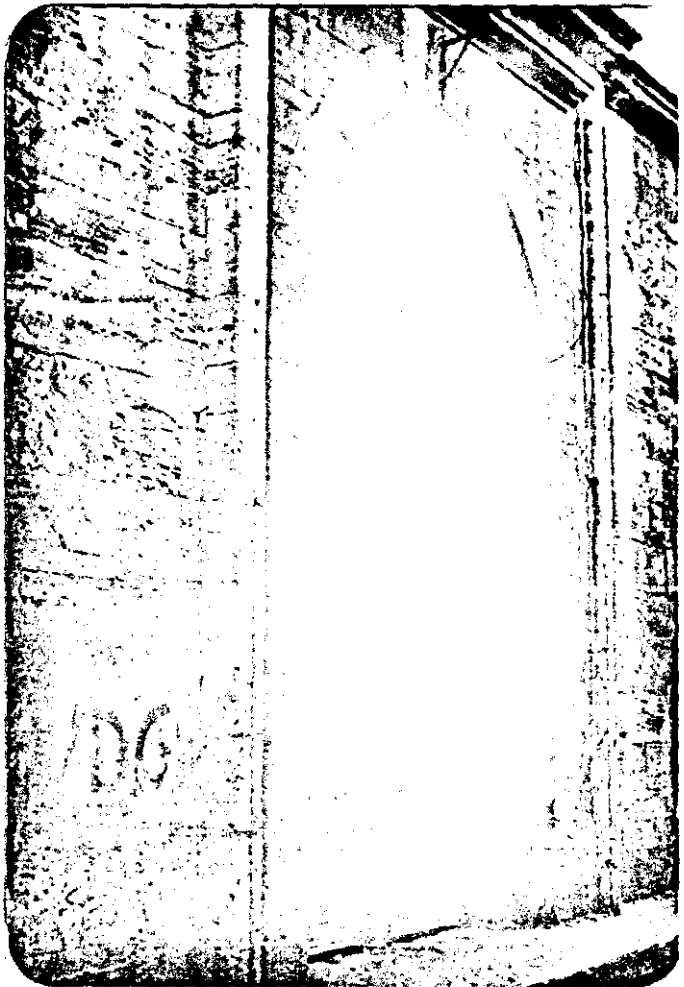
37. Darü'ssifa of Süleymaniye



38. Plan of the darü'ssifa of Süleymaniye



39. Darüşşifa of Süleymaniye, entrance façade



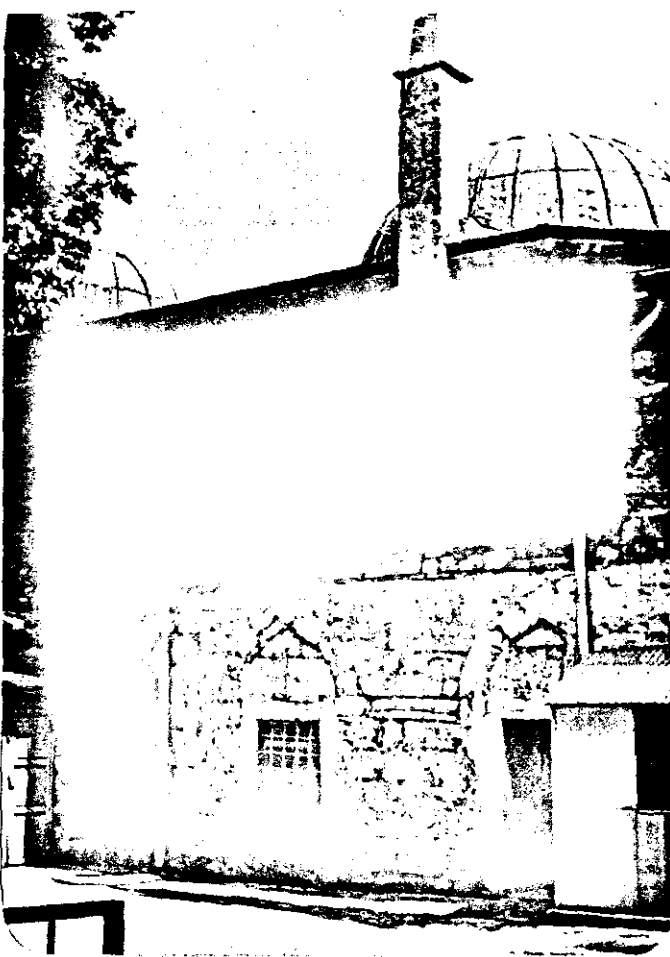
40. Darüşşifa of Süleymaniye, entrance door



41. Darüşşifa of Süleymaniye, outer court



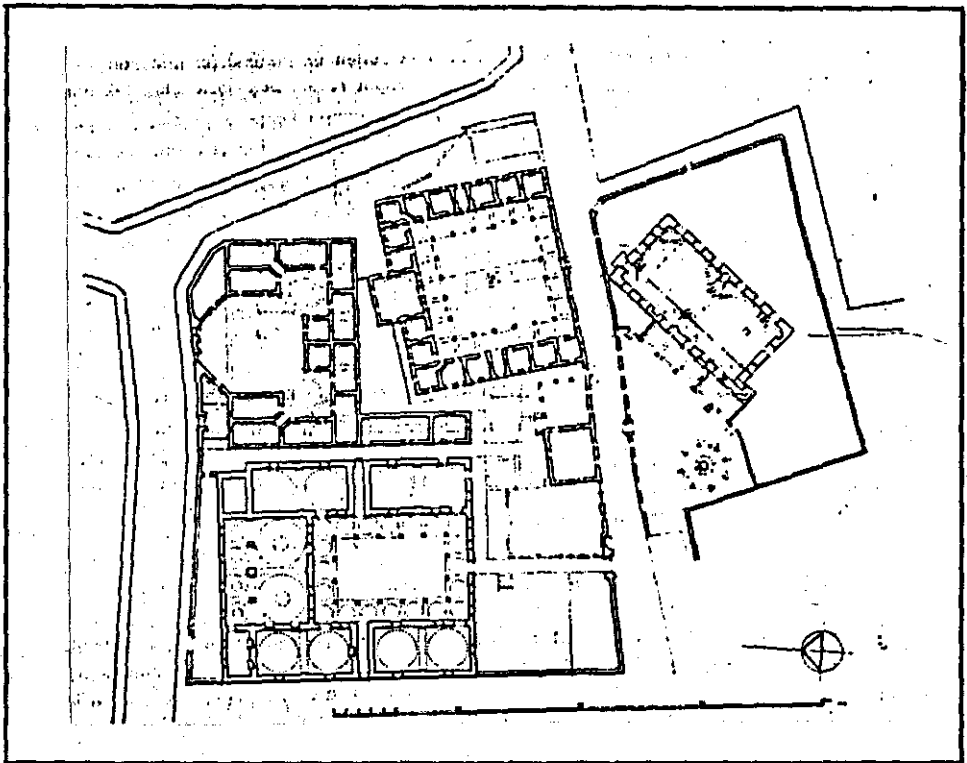
42. Darüşşifa of Süleymaniye,
inner court



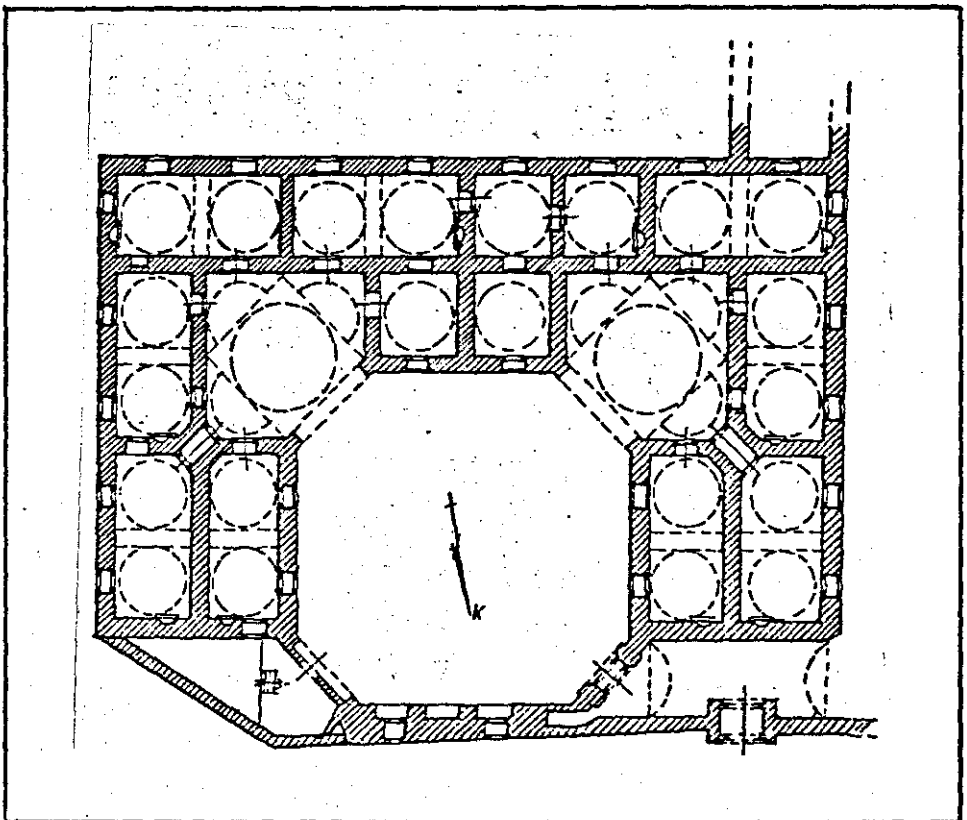
43. Darüşşifa of Süleymanye, western façade



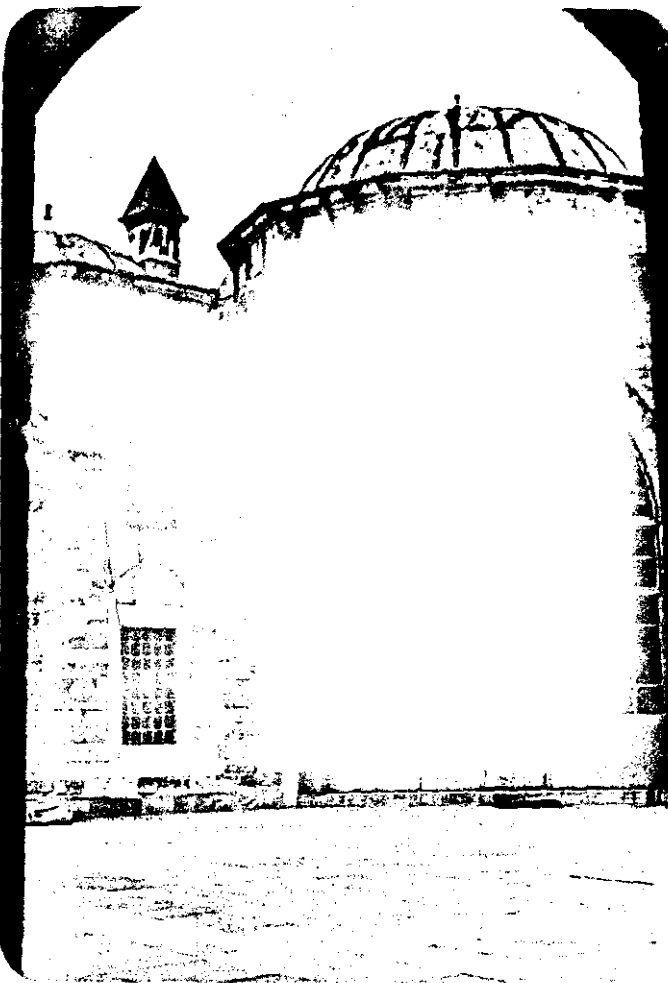
44. Darüşşifa of Süleymanye, northern façade



45. Complex of Haseki, plan (Kuran)



46. Plan of the darüşşifa of Haseki (Güreşsever)



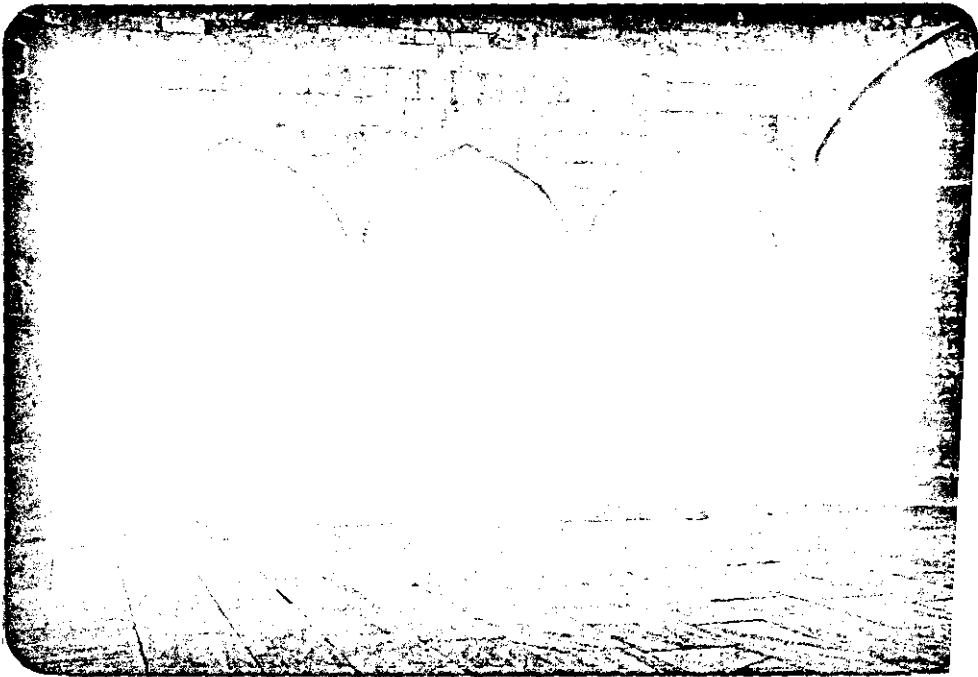
47. Darü'ssifa of Haseki,
courtyard



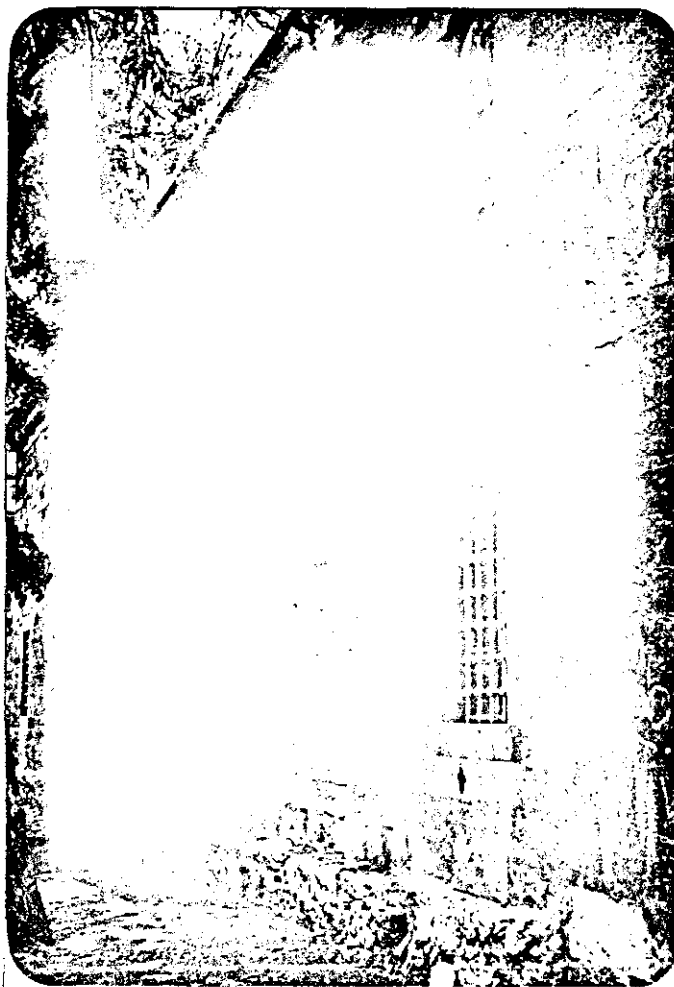
48. Darü'ssifa of Haseki,
entrance façade



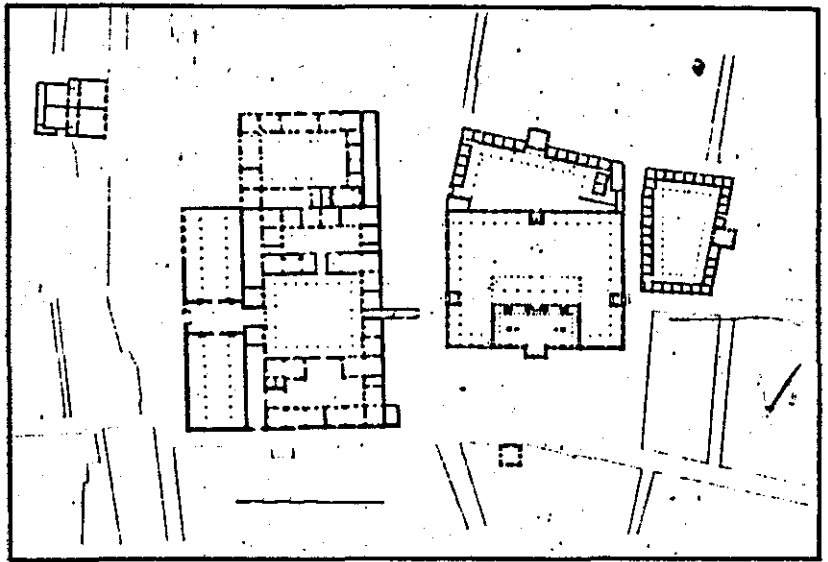
49. Darü'sşifa of Haseki, northern façade



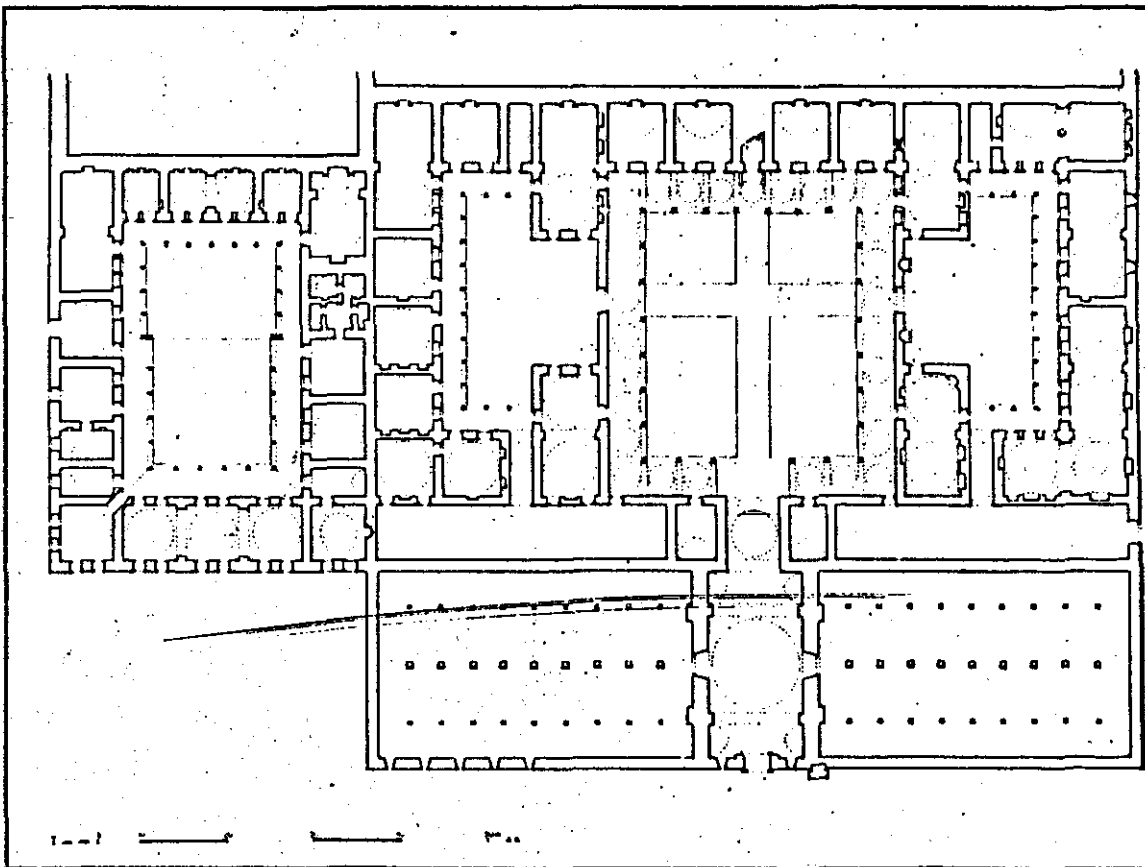
50. Darü'sşifa of Haseki, courtyard



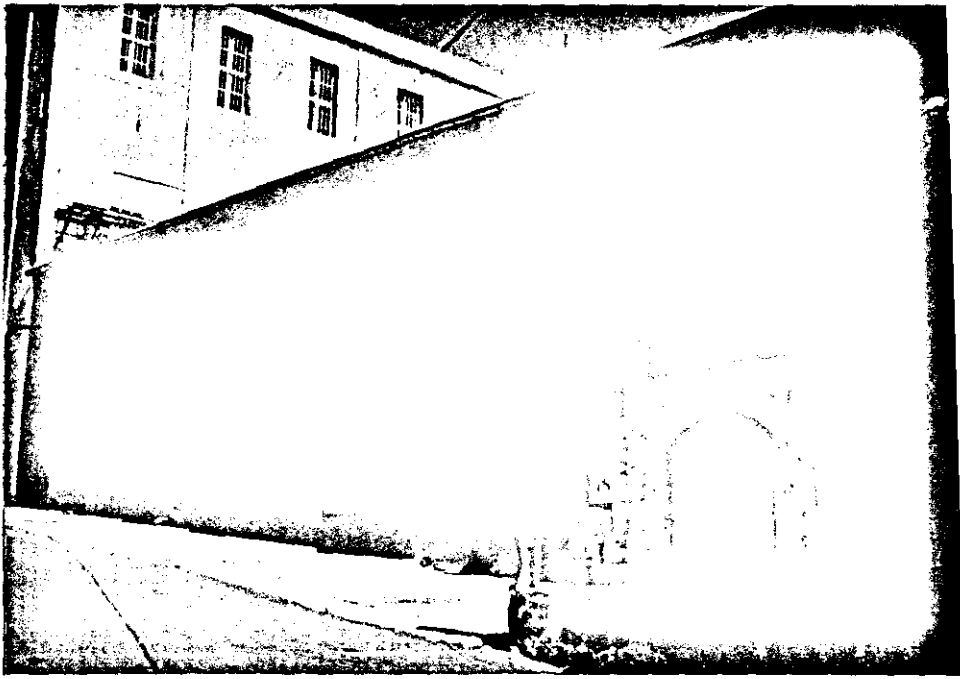
51. Darüşşifa of Haseki,
eastern façade.



52. Complex of Atik Valide, plan (Ülgen)



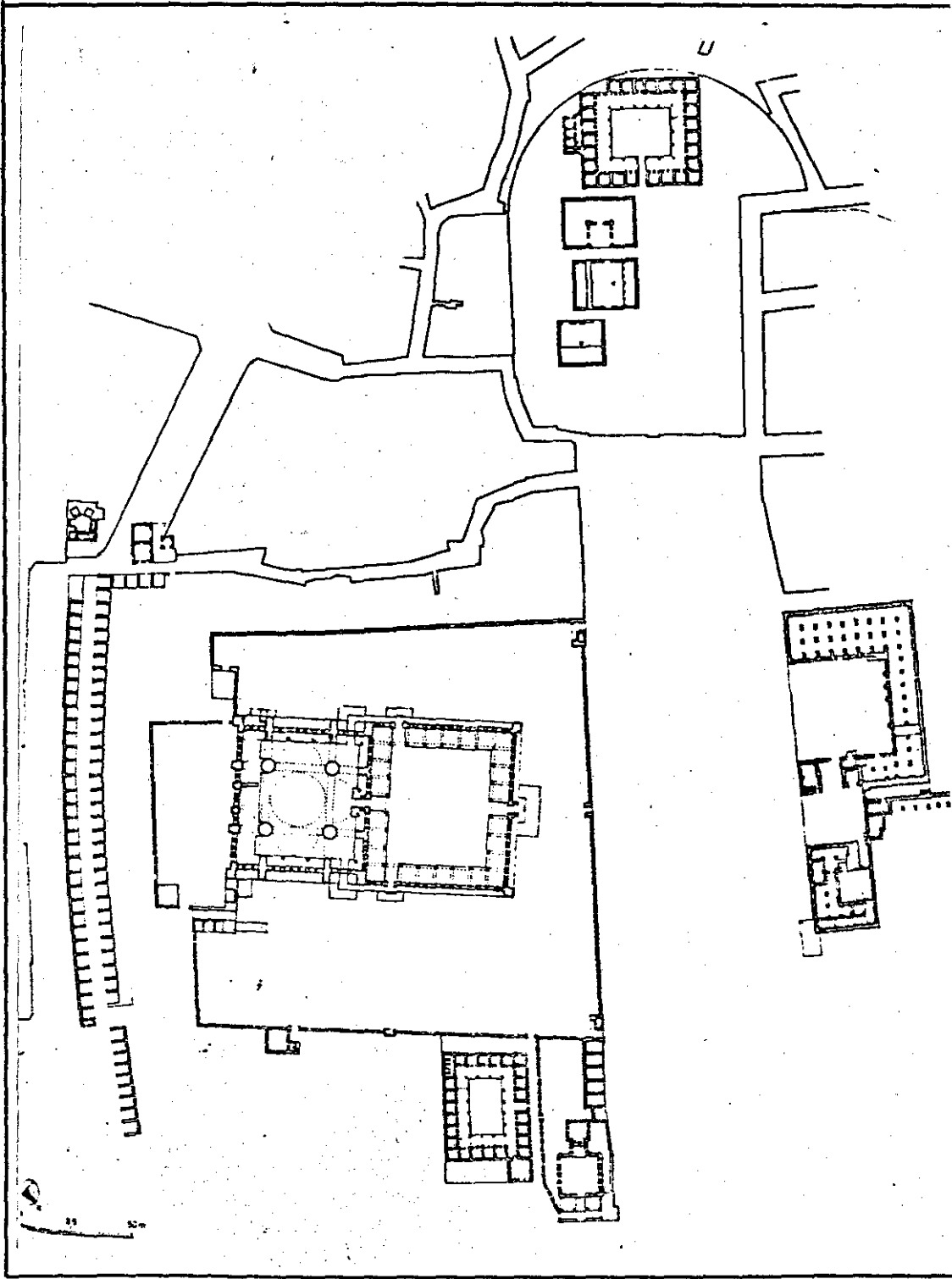
53. Plan of the darüşşifa and imaret of Atik Valide (Kuran)



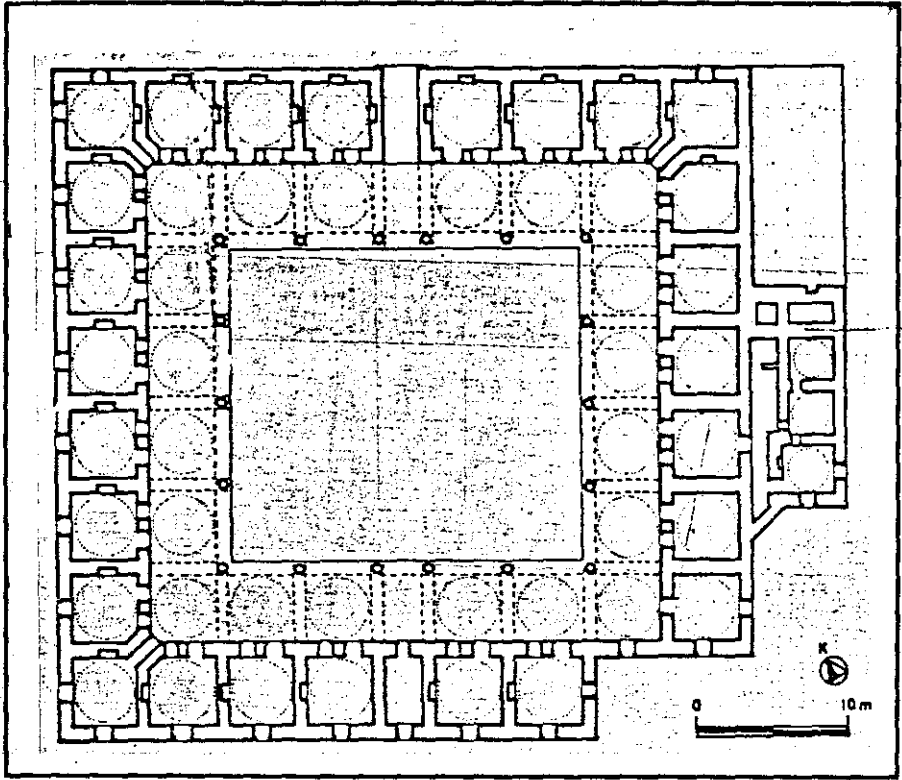
54. Darüşşifa of Atik Valide, entrance façade



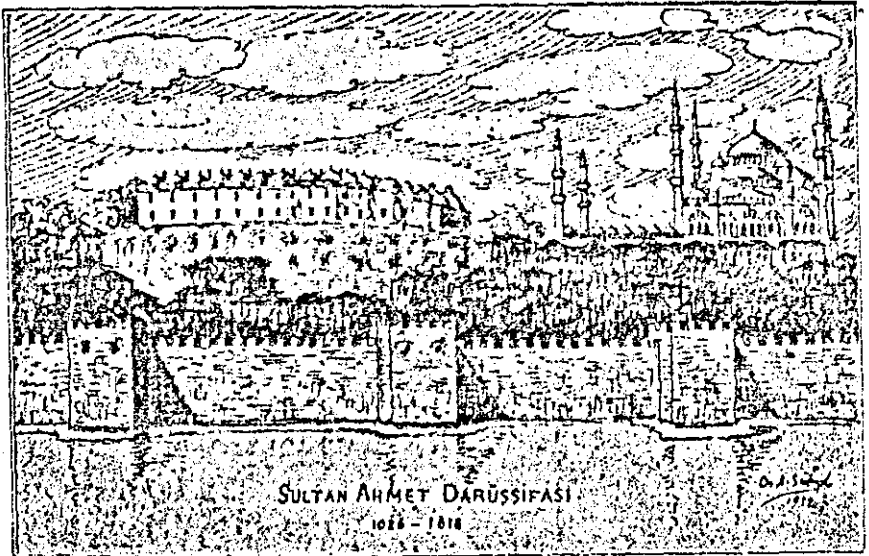
55. Darüşşifa of Atik Valide, courtyard



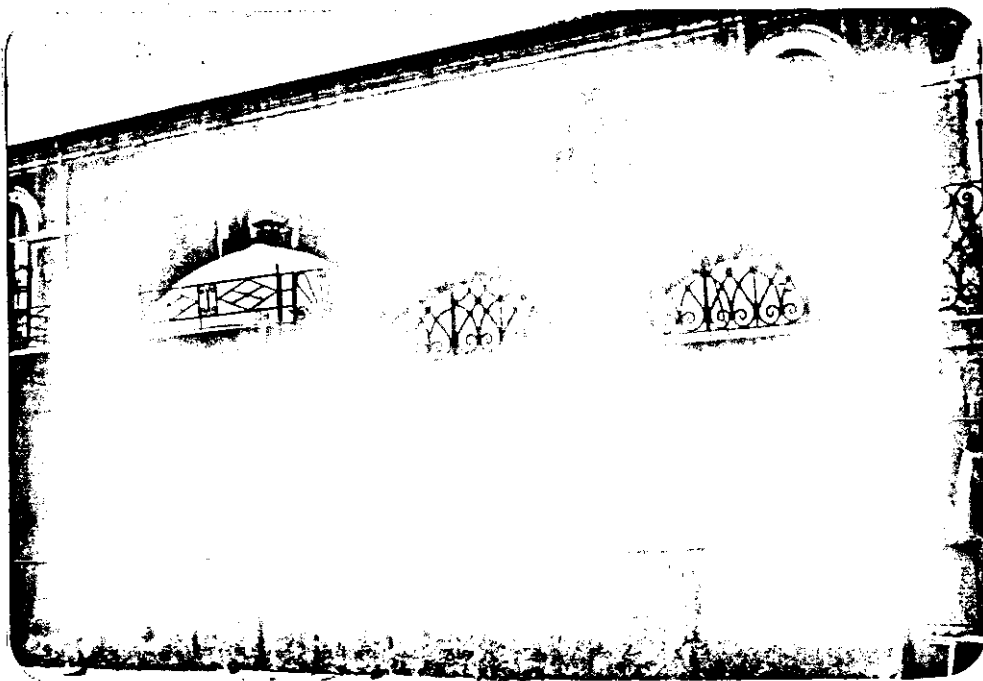
56. Complex of Sultan Ahmet, plan (Nayır)



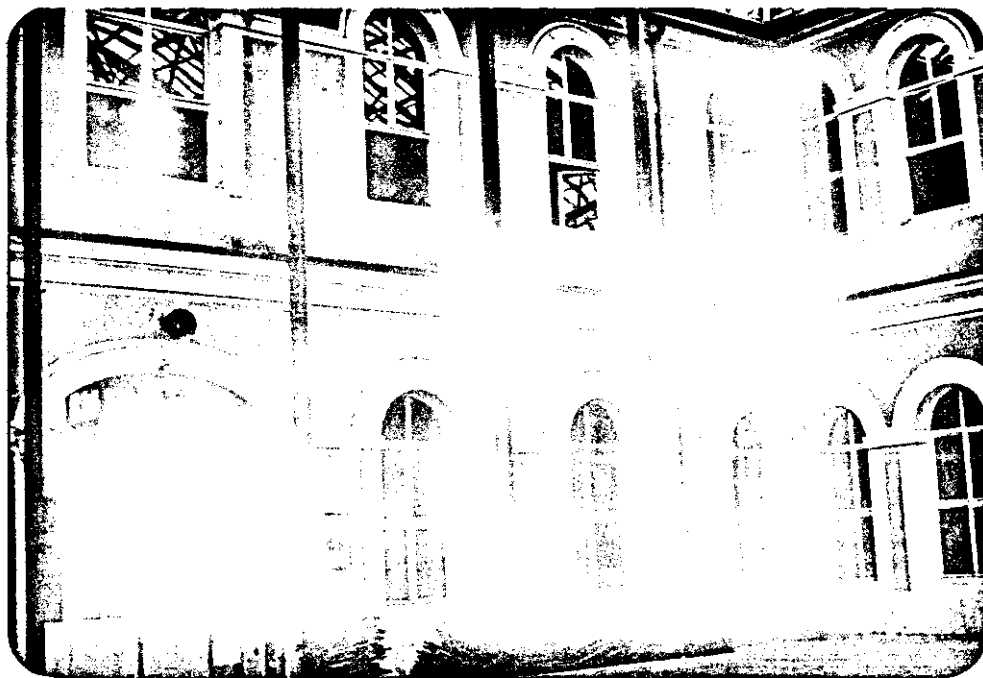
57. Plan of the darüŝŝifa of Sultan Ahmet (Nayır)



58. Darüŝŝifa of Sultan Ahmet (Ünver)



59. Bath attached to Sultan Ahmet darüşşifa



60. Darüşşifa of Sultan Ahmet, courtyard