SCIENCE HAS MANY Western and Eastern historical roots. All of these contributed to the body of academic literature. One of the most important aspects of scientific progress is educational institutions, including hospitals, schools, and libraries. Some of these institutions may offer an identity for a city, as well as contribute to its development. Süleymaniye Külliyesi is one such institution. Süleymaniye Külliyesi, established in the 16th century, contains many centers, including a mosque, surrounded by a hospital, school of medicine, central pharmacy, and library. It once served both the Ottoman Empire and the Turkish Republic. The school of medicine of this complex was the first school of medicine in the Ottoman period that functioned in coordination with the hospital and central pharmacy. The library contains many rare books and manuscripts. Currently, it is one of the richest centers in the field of oriental studies. We conclude that Süleymaniye Külliyesi, with its health-related elements and library, contributed to the development and progress of science and deserves to be cited in the literature of the Western world.

KEY WORDS: History, Hospital, School of Medicine, Süleymaniye Külliyesi, Turkey

Throughout history, health and educational institutions have been established in many communities at different periods of civilization and development. These institutions respond to the needs of societies at large and are closely related to the existence of society and cities. In other words, leading health and education institutions create an identity for a city, as well as contributing to its development. One may cite ancient examples, such as the Asclepiad on Island Cos and the libraries at Alexandria and Pergamum, as well as modern examples such as Harvard, Oxford, and Cambridge. These institutions had basic functions, but also shaped the fabric of the cities and their sociocultural structures. One of the best examples of institutional and urban organization is the Süleymaniye Külliyesi (the complex of Sultan Süleyman) in Istanbul. This complex contained several institutions, including a medical school, hospital, library, and central pharmacy. Mimar Sinan, the leading architect of the Ottoman times, designed and constructed it by the order of Sultan Süleyman, the Magnificent, also known as the “Lawgiver” in the Muslim world.

The purpose of this study is to describe the Süleymaniye Külliyesi’s general characteristics, its sections and, in particular, the medical school, hospital, and pharmacy that provided vital functions in the complex in terms of medical and scientific history. The study will also concentrate on the Süleymaniye Library, an essential resource for the educational institutions within the complex. This review, however, may benefit from knowledge regarding the historical and geographical setting of Istanbul in which Süleymaniye Külliyesi was founded.

ISTANBUL FROM PAST TO PRESENT

Istanbul was an imperial city of the world and played a unique role on the stage of history as the center of the Roman, the Eastern Roman (Byzantine), and the Ottoman Empires. Istanbul is a historical city established on both sides of the Bosphorus, which separates Asia and Europe. It might also be said that Istanbul joins East and West.

The first settlements in the vicinity of Istanbul stretch back to the Paleolithic era. In the 13th century BC, tribes such as the Thracians, Phrygians, and Bithynians, who crossed into
Istanbul through Anatolia built settlements in Istanbul and its surroundings. The name of Byzantium, from the name of the Thracian king (Byzas), was given to the city that was established. Even though Byzantium remained independent, whereas the Romans were moving toward the East, Byzantium joined the Roman Empire in AD 73, and became the capital of the Empire in 330. The name of the city was changed to Constantinople, after the Roman Emperor Constantine. When Constantine later accepted Christianity, it became the most important cultural and artistic hub point of Christianity through the Middle Ages, and, from time to time, the most important political and economic center as well. From such times until today, the center of the Orthodox Church has been here. When the Empire was divided into two in 395, Constantinople (one may wonder if in fact the Middle Ages began at this date) became the capital of the Byzantine Empire or, as it was then better known, of the Eastern Roman Empire. The name of the city conquered in 1453 by the Ottomans under Fatih Sultan Mehmed became Istanbul. Istanbul was the capital of the Ottoman Empire for 470 years. After World War I and the Turkish War of Independence, the Ottoman Empire was abolished and a republic declared in 1923. After this, the capital of the Turkish Republic was moved to Ankara, because of its position at the heart of Anatolia, and Istanbul lost its supreme title after 1590 years.

In Istanbul, old and new intersect and blend together, merging long years of history. St. Sophia Church, reflecting the grandeur of the Byzantine Empire; Topkapi Palace, which was the administrative center of the Ottoman Empire; and Blue Mosque, which is one of the important religious buildings, created a cultural mosaic standing side by side. The most significant element completing this historical mosaic is the Süleymaniye Külliyesi. The Süleymaniye Külliyesi is one of the oldest historical institutions in the world that is still in use today. Süleymaniye Külliyesi is the image and symbol of Istanbul, similar to Rome’s San Pietro, Paris’ Notre Dame, and London’s Saint Paul (7).

THE OTTOMAN EMPIRE’S SOCIAL AND SCIENTIFIC LEVEL IN THE 16TH CENTURY

When the Ottoman Empire was established at the end of the 13th century, the first administration was simple, but it grew with time as conquests spread, and grew with the conquest of Istanbul in 1453. The 10th sultan of the Empire was Kanuni Sultan Süleyman (1494–1566) (Fig. 1). His reign was a period in which conquests provided contact with quite a few countries, populations, and trade centers. As the army grew, logistical services gathered around the Sultan (2). This was, from every point of view, a period of growth that reflected the image of Sultan Süleyman, who was bestowed the name “Süleyman the Magnificent” by the Europeans. The Ottoman Empire expanded, and its borders broadened in the east to the western parts of Persia, in the south to Sudan, in the North to the gates of Vienna, and in Africa to Morocco.

When the Empire was established, it was a period of growth that reflected the importance of cultural and artistic hub of Christianity through the Middle Ages, and, from time to time, the most important political and economic center as well. From such times until today, the center of the Orthodox Church has been here. When the Empire was divided into two in 395, Constantinople (one may wonder if in fact the Middle Ages began at this date) became the capital of the Byzantine Empire or, as it was then better known, of the Eastern Roman Empire. The name of the city conquered in 1453 by the Ottomans under Fatih Sultan Mehmed became Istanbul. Istanbul was the capital of the Ottoman Empire for 470 years. After World War I and the Turkish War of Independence, the Ottoman Empire was abolished and a republic declared in 1923. After this, the capital of the Turkish Republic was moved to Ankara, because of its position at the heart of Anatolia, and Istanbul lost its supreme title after 1590 years.

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THE BUILDING OF THE SÜLEYMANİYE KÜLLİYESİ

Süleymaniye Külliyesi was built by Mimar Sinan (1489–1588) who was the architect laureate of the Ottoman Empire. In his works, Mimar Sinan synthesized the local and the universal, meshed Turkish-Islamic elements, and reflected the influences of Byzantium and the Renaissance, thus, producing the symbol of the classical age in Anatolian-Turkish architecture (12). The construction of Süleymaniye Külliyesi began in 1550 and was completed in 1559 (17). The notable Ottoman historian, von Hammer, alluded to the idea that Süleymaniye Külliyesi was an answer given by Süleyman the Magnificent to the words “Oh, Solomon, I have surpassed you (I have won over you and am your superior)” that Emperor Justinian spoke at the opening of St. Sophia Church, in reference to the temple that King Solomon of biblical times built in Jerusalem (15).

GENERAL CHARACTERISTICS AND SECTIONS OF SÜLEYMANİYE KÜLLİYESİ

This complex consisted of general and health-related parts, including a mosque, four schools that offered middle education (the First, Second, Third, and Fourth Schools); two schools for higher education, one medical and the other theological; the pharmacy; a hospital; a guest house; a soup kitchen; a caravanserai where people could stay; a public bath; and two mausoleums for Süleyman the Magnificent and his wife, Hürrem Sultan, and a modestly scaled mausoleum for Mimar Sinan (Figs. 2 and 3). The centers not related to health (i.e., the Mosque, Divinity School, Public Bath, Public Soup Kitchen,
and Guesthouse) are beyond the scope of this study. Schools, however, are important parts of the complex. The Primary School (Sibyan Mektebi) was built to provide primary education to young pupils, and the First and Secondary (High) Schools (Evvel and Sani) were built as open courtyard schools. Today, both are used as annexes of Süleymaniye Library. The Fourth and Third (High) Schools (Rabi and Salis) cover a larger area than the First and Second Schools (14). The Fourth School has recently been assigned to the Turkish Academy of Sciences (TUBA), and, here, restoration work is being performed to build a modern scientific and cultural center.

THE KÜLLİYE AREAS RELATED TO HEALTH

The medical school and hospital were the most important elements of the health-related parts of Külliye. From the information that is found in the trust deed (statutory documents), one understands that theoretical education was provided at the medical school, practical medical education was provided in the hospital, and that the two institutions complemented one another as a medical center (11).

According to the rule of the Külliye’s trust deed, the medical staff of the hospital included three doctors, two ophthalmologists, and two surgeons. It is of note that, in Islamic medical tradition, surgeons and ophthalmologists were not accepted as medical doctors and that their salaries were lower than medical doctors. The duties of the doctors are mentioned as follows: diagnosis and treatment of sicknesses, knowledge regarding the benefits of medicine, the foundation of sicknesses and symptoms and various pains, and awareness of sicknesses and symptoms. The two ophthalmologists clearly had to be experts with a wide knowledge of the art and in preparing the medications used for both the diagnosis and treatment of eye diseases. The two surgeons specialized in abscess and conjunctive tissue medicines, in curing tumors and hernias, in removing teeth, in taking blood and in closing pus, and in applying ointments and oils. In the medical school, it was clear that the professor should be knowledgeable of Plato and Aristotle and had to be as experienced as Galen (8). In the trust deed, there was no further information regarding the school’s teaching programs. Any sick person was accepted to the hospital.

The Hospital (Duru’s-si̇fa)

The hospital, located in the northwest part of the Süleymaniye Külliyesi and identified as the hospital in the trust documents, was at the top of the hospital hierarchy. In the medical school, students who took theoretical lessons 4 days a week attended their practical lessons in the hospital, which had 30 rooms and two courtyards (17). The difference between this hospital with its 40 to 50 beds and the other Ottoman hospitals was the existence of a special neuropsychiatry service (13). Patients with mental and neuropsychiatric disorders were treated in this department with medicine and music therapy. The neuropsychiatry department began with 20 beds. After the establishment of Bezmi Alem Valide Gureba Hospital in 1845, non-neurological patients were transferred there, and the hospital was used as a mental health clinic from 1845 onward. During the 1865 cholera epidemic, it was used as a quarantine area for those who had cholera. Thereafter, it was again reserved for the mentally ill (1). Between 1858 and 1865, the Italian Dr. Mongeri (1818–1883), who was originally from Lombardia, Italy and pioneered modern psychiatric practices in Turkey, served as the chief doctor at the Süleymaniye Hospital. According to Mongeri, “The number of the mental patients were limited to 20, and the number of non medical staff were 150. Although the number of staff seems to be exaggerated by many, it includes auxiliary servicemen such as barbers, cleaners and bathroom attendants, etc. Because all patients were to be bathed and expected to go to the barbershop once a week” (9).

This portion functioned as a hospital where, until 1873, doctors, surgeons, and eye doctors worked all day and looked after people with no fee or charge. The hospital building was later used by people engaged in leather working and as a
printing press (16). Today, the building is in a neglected condition.

The Medical School (Daru’t-tip)

The Süleymaniye Medical School was the sole medical school of the Ottoman state. This school, although it differed from previous health institutions, had a singular place in Ottoman scientific and educational history because it was devoted exclusively to medical education (17). Medical education was provided within the structure of the hospitals until the time when it obtained a separate status with the Süleymaniye Medical School. Before the founding of the Süleymaniye Medical School, medical education was obtained in a traditional master-apprentice relationship at the hospitals. However, after the opening of the Süleymaniye Medical School, a limited number of doctors were educated in these health institutions. Thus, the need for doctors for the country was met partly by the Süleymaniye Medical School and partly by those who were trained at the hospitals by doctors who came in limited numbers from other countries and from other medical institutions (17). The area where the medical school that gave theoretical medical education was located is now the Süleymaniye Birth and Child Care Unit.

It is of significant note that many surgeons of Ottoman Empire were trained in this institution. The review of documents of this institution revealed that there were many surgical instruments in the school. It is also known that the special anatomy education was an important part of surgical training in this school. Many surgeons who graduated from this school went on to work as military or public surgeons.

The Pharmacy (Daru’l-akakir)

A central pharmacy, called the Daru-l-akakir (storeroom for drugs), was located in the north part of the medical school across from the hospital. The drugs for the patients being treated as either in- or outpatients, as well as the medicinal needs of other hospitals in Istanbul, were provided by this central medicine depot. In this pharmacy, medicines, such as various natural drugs, pastes, effective poultices, syrups, pills, oils, etc., were prepared by those on duty.

SÜLEYMANİYE KÜLLİYESİ LIBRARY

The Süleymaniye Library continues to provide educational and cultural services today. In terms of the number of books in three languages—Arabic, Persian, and Turkish—Süleymaniye Library is among the world’s richest libraries for handwritten manuscripts (4). The trust deed specifies that “in order to prepare books, a librarian and an assistant was to be employed” when Mimar Sinan designed a library within the Süleymaniye Külliyesi (8). Nearly 200 years after the construction of the Külliye, there were five librarians and five assistants in this library, by order of the Sultan Mahmud I, in 1751 to 1752 (6). The reestablishment of today’s Süleymaniye Library stretches back to World War I. A center was first created in 1914 to protect the approximately 10,000 handwritten manuscripts in the various foundation libraries in Istanbul. Later, in 1918, they were brought to the library opened, under the name of the Süleymaniye General Library, inside the Külliye. In 1961, the library was to become a center for handwritten manuscripts (6). The total number of books in the library exceeds 170,000. Today, the library houses quite a few manuscripts and books printed in Arabic, Persian, and Turkish, and Arabic letters on varied topics, such as history, geography, literature, religion, philology, mathematics, medicine, physics, chemistry, biology, earth sciences, philosophy, and logic, which comprise the cultural and scientific treasury of the Eastern world spanning several centuries.

From the perspective of the history of science and medicine, there are many important books in the collection. Some of the interesting and important books found in these collections include an Arabic copy of De Materia Medica, the important work of Dioscorides, who lived in the 1st century AD at Anazarba (Aynizerbi), in the area of Cilicia (Adana), within the border of present day Turkey (Fig. 4), Canon of Medicine, a copy of the Arabic translation of book written by Avicenna (980–1037), Risale-i Teshiru’l Ebdan, the first anatomy book written in Turkish by Şemsettin Itaki in 1632 (3), and Kitab-i Bahriye, a Turkish maritime geography book written by Piri Reis in 1521. It is of note that, in the foreward of Kitab-i Bahriye, it is stressed that the world was globe-shaped and the discovery of America and Christopher Columbus are mentioned. The book includes several
maps and charts. Notably, Piri Reis’ famous world map is currently in the Topkapi Museum (Istanbul). This map demonstrates some of the eastern parts of America (Fig. 5). In Piri Reis’ world map of Africa and the North, half had been cut off and lost; the remaining section takes in Spain and East Africa, including the Antilles Islands, as well as what was known of the Atlantic Ocean and America at the time. It is thought that the American part of the extant map was copied from the map that Christopher Columbus made in 1489 and that subsequently disappeared. Piri Reis also discusses Columbus in the Kitab-i Bahriye and says that he possessed this map.

**DISCUSSION**

The Süleymaniye Külliyesi is a primary symbol of Istanbul, which served as the capital of a number of empires for 1593 years, and is one of Turkey’s primary cultural heritage sites today. The significance of the Süleymaniye Külliyesi is not based only on its unparalleled architecture, but also because, as time progressed, its functions changed. Through the years, Süleymaniye has functioned as a medical school and a hospital. It was one of the world’s rare institutions that combined a hospital with a medical school. The mentally ill were accommodated separately in a dedicated section and those who were being treated for neuropsychiatric ailments were treated separately from those patients who were there as outpatients for other ailments. All of these characteristic measures mark the originality of this hospital.

This variety in purpose and function was, perhaps, a goal that Sultan Süleyman sought. Actually, this functionality is one of public service and basic motivations. Other motivations include offering a philanthropic service to ensure their place in heaven, to meet society’s needs for scientists and doctors, and, perhaps, to provide a challenge announcing that the Ottoman Empire is an everlasting, immortal state. Really, as one examines history, every newly established empire has either destroyed the works of the previous empire or has put something better up beside the previous works. New empires are established with cannon and rifle, but new empires survive by creating new buildings and services. In our opinion, this last factor played a major role in the foundation of the Süleymaniye Complex. However, although the Sultan Ahmet mosque was across from St. Sophia, the Ottoman Süleymaniye was erected opposite from the Byzantine health houses.

Similar to other buildings, this one would not have been able to stand up against the test of time if its functions did not change. But, since then, it has yielded to the pressures of time. Today, the complex has become a district of the poor, and its former magnificence has been lost. Until the 1950s, the area protected its traditional fabric. In Süleymaniye, the wooden houses reflect the old appearance of the city. They have been taken under protection and their restoration is frequently on the agenda. Unfortunately, however, such a project has not yet been put into action. Süleymaniye, as a historical district, has become a focus of tourism because of the mosque and
In addition, there are various buildings and faculties of Istanbul University, the Esnaf (Tradesmen's) Hospital and the Suleymaniye Mother and Child Care Clinic. Together, they continue the district's traditional functions as a center of education, science, and health. The most important of these buildings, however, is the Suleymaniye Library, which is one of the largest libraries in the world for the field of oriental studies. The library has successfully protected its old manuscripts and printed works in historic fields, performing the function of transmitting the cultural accumulation of the past to the future.

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Acknowledgments

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COMMENTS

With the current vigor and increasingly important contributions of neurosurgeons from Turkey, this article is of significant interest. It is a well-crafted historical review of an important Turkish center that produced significant advances in medical science that began in the 16th century. Its interesting and pertinent information will be novel for most readers and serves as a baseline for following further advances in neurosurgery in Turkey.

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A part of a tour group last May, I had an opportunity to visit the Suleymaniye complex, and I made it a point to visit the hospital. Our tour guide was kind enough to take me to visit the nearby maternity center. I was impressed by its relaxed and garden setting, but we did not have time to visit the library. Therefore, this article is of great interest to me, as the authors present the history of one of the first university-type medical school complexes, which included a hospital with an outpatient clinic and a medical library. Equally innovative was the formal pharmacy that they described. It is impressive to read how this medical school included practical clinical teaching following the Hippocratic tradition during a time when the apprenticeship system was more common in the West. The authors should be congratulated for contributing this well-presented, but not well-known, facet of medical history.